

**§ 86.1506–94**

**40 CFR Ch. I (7–1–04 Edition)**

fueled Otto-cycle light-duty trucks. Equipment required and specifications are as follows:

(1) *Exhaust emission tests.* All engines and vehicles subject to this subpart are tested for exhaust emissions. Necessary equipment and specifications appear in §§ 86.1509 through 86.1511.

(2) *Fuel and analytical tests.* Fuel requirements for idle exhaust emission testing are specified in § 86.1513. Analytical gases are specified in § 86.1514.

(b) [Reserved]

[54 FR 14612, Apr. 11, 1989]

**§ 86.1506–94 Equipment required and specifications; overview.**

(a) This subpart contains procedures for performing idle exhaust emission tests on Otto-cycle heavy-duty engines and Otto-cycle light-duty trucks. Equipment required and specifications are as follows:

(1) *Exhaust emission tests.* All engines and vehicles subject to this subpart are tested for exhaust emissions. Necessary equipment and specifications appear in §§ 86.1509 through 86.1511.

(2) *Fuel and analytical tests.* Fuel requirements for idle exhaust emission testing are specified in § 86.1513. Analytical gases are specified in § 86.1514.

(b) [Reserved]

[59 FR 48536, Sept. 21, 1994]

**§ 86.1509–84 Exhaust gas sampling system.**

(a) The exhaust gas sampling system shall transport the exhaust sample from the engine or vehicle to the analysis system in such a manner as to maintain the integrity of the sample constituents that are to be analyzed.

(b) The sample system shall supply a dry sample (i.e., water removed) to the analysis system.

(c) A CVS sampling system with bag analysis as specified in § 86.1309 or § 86.109 or with continuous analysis as specified in § 86.1310 is permitted as applicable. The inclusion of an additional raw carbon dioxide (CO<sub>2</sub>) analyzer as specified in §§ 86.309–79 and 86.316–79 is required if the CVS system is used, in order to accurately determine the CVS dilution factor. The heated sample line specified in § 86.309–79 and § 86.310–79 for

raw emission requirements is not required for the raw CO<sub>2</sub> measurement.

(d) A raw exhaust sampling system as specified in § 86.309–79 and § 86.310–79 is permitted.

[48 FR 52252, Nov. 16, 1983, as amended at 60 FR 34376, June 30, 1995]

**§ 86.1511–84 Exhaust gas analysis system.**

(a) Analyzers used for this subpart shall meet the following specifications:

(1) The analyzer used shall conform to the emission measurement accuracy provisions of § 86.1338.

(2) The resolution of the readout device(s) for the range specified in paragraph (a)(1) of this section shall be equal to or less than 0.05 percent for the CO analyzer.

(3) For the range specified in paragraph (a)(1) of this section, the precision shall be less than ±3 percent of full-scale deflection. The precision is defined as two times the standard deviation of five repetitive responses to a given calibration gas.

(4) For the range specified in paragraph (a)(1) of this section, the mean response to a zero calibration gas shall not exceed ±3 percent of full-scale deflection during a 1-hour period.

(5) For the range specified in paragraph (a)(1) of this section the drift of the mean calibration response shall be less than ±3 percent of full scale during a 1-hour period. The calibration response is defined as the analyzer response to a calibration gas after the analyzer has been spanned by the electrical spanning network at the beginning of the 1-hour period.

(6) The analyzer must respond to an instantaneous step change at the entrance to the sampling system with a response equal to 90 percent of that step change within 15 seconds or less on the range specified in paragraph (a)(1) of this section. The step change shall be at least 60 percent of full-scale deflection.

(7) The interference gases listed shall individually or collectively produce an analyzer reading less than ±2 percent of full scale on the range specified in paragraph (a)(1) of this section.

**Environmental Protection Agency**

**§ 86.1526-84**

Interference gas	Concentration	Applicable analyzer
CO <sub>2</sub> .....	14 percent .....	CO
C <sub>3</sub> H <sub>8</sub> .....	1 percent .....	CO
H <sub>2</sub> O .....	Saturated vapor at 100° F .....	CO
NO <sub>x</sub> .....	1,000 ppm .....	CO
O <sub>2</sub> .....	5 percent .....	CO

**§ 86.1516-84 Calibration; frequency and overview.**

(a) Calibrations shall be performed as specified in §§ 86.1518-84 through 86.1526-84.

(b) At least monthly or after any maintenance which could alter calibration, check the calibration of the CO analyzer. Adjust or repair the analyzer as necessary.

(c) Water traps, filters, or conditioning columns should be checked before each test.

(8) The analyzer shall be able to meet the specifications in paragraph (a) of this section under the following conditions:

(i) After a 30 minute warm-up from the prevailing ambient conditions;

(ii) Between 0 to 85 percent relative humidity; and

(iii) During variations of ±50 percent of nominal sample flow.

(b) The inclusion of a raw CO<sub>2</sub> analyzer as specified in § 86.309-79 and § 86.316-79 is required in order to accurately determine the CVS dilution factor.

**§ 86.1519-84 CVS calibration.**

If the CVS system is used for sampling during the idle emission test, the calibration instructions are specified in § 86.1319-84 for heavy-duty engines, and § 86.119-78 for light-duty trucks.

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

**§ 86.1513-90 Fuel specifications.**

The requirements of this section are set forth in § 86.1313-90(a) for heavy-duty engines, and in § 86.113-90(a) for light-duty trucks.

[53 FR 478, Jan. 7, 1988]

**§ 86.1513-94 Fuel specifications.**

The requirements of this section are set forth in § 86.1313-94 for heavy-duty engines and in § 86.113-94 for light-duty trucks.

[59 FR 48536, Sept. 21, 1994]

**§ 86.1514-84 Analytical gases.**

(a) The final idle emission test results shall be reported as percent for carbon monoxide on a dry basis.

(b) If the raw CO sampling system in § 86.309-79 is used, the analytical gases specified in § 86.308-79 shall be used.

(c) If a CVS sampling system is used, the analytical gases specified in § 86.1314 shall be used.

[48 FR 52252, Nov. 16, 1983, as amended at 51 FR 24613, July 7, 1986; 60 FR 34377, June 30, 1995]

**§ 86.1522-84 Carbon monoxide analyzer calibration.**

(a) *Initial check.* (1) Follow good engineering practice for instrument start-up and operation. Adjust the analyzer to optimize performance on the range specified in § 86.1511-84(a)(1).

(2) Calibrate the analyzer with the calibration gas specified in § 86.1514-84.

(3) Adjust the electrical span network such that the electrical span point is correct when the analyzer reads the calibration gas correctly.

(4) Determine that the analyzer complies with the specifications in § 86.1511-84.

(b) *Periodic check.* Follow paragraphs (a) (1), (2), and (3) of this section as specified by § 86.1516-84(b). Adjust or repair the analyzer as necessary.

**§ 86.1524-84 Carbon dioxide analyzer calibration.**

(a) The calibration requirements for the dilute-sample CO<sub>2</sub> analyzer are specified in § 86.1324-84 for heavy-duty engines and § 86.124-78 for light-duty trucks.

(b) The calibration requirements for the raw CO<sub>2</sub> analyzer are specified in § 86.330-79.

**§ 86.1526-84 Calibration of other equipment.**

Other test equipment used for testing shall be calibrated as often as necessary according to good engineering practice.