

§ 86.165-12

40 CFR Ch. I (7-1-14 Edition)

H = measured test humidity in grains of water/pound of dry air.

[71 FR 77922, Dec. 27, 2006, as amended at 74 FR 61548, Nov. 25, 2009]

§ 86.165-12 Air conditioning idle test procedure.

(a) *Applicability.* This section describes procedures for determining air conditioning-related CO₂ emissions from light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles. The results of this test are used to qualify for air conditioning efficiency CO₂ credits according to § 86.1866-12(c).

(b) *Overview.* The test consists of a brief period to stabilize the vehicle at idle, followed by a ten-minute period at idle when CO₂ emissions are measured without any air conditioning systems operating, followed by a ten-minute period at idle when CO₂ emissions are measured with the air conditioning system operating. This test is designed to determine the air conditioning-related CO₂ emission value, in grams per minute. If engine stalling occurs during cycle operation, follow the provisions of § 86.136-90 to restart the test. Measurement instruments must meet the specifications described in this subpart.

(c) *Test cell ambient conditions.* (1) Ambient humidity within the test cell during all phases of the test sequence shall be controlled to an average of 40-60 grains of water/pound of dry air.

(2) Ambient air temperature within the test cell during all phases of the test sequence shall be controlled to 73-80 °F on average and 75 ± 5 °F as an instantaneous measurement. Air temperature shall be recorded continuously at intervals of not more than 30 seconds.

(d) *Test sequence.* (1) Connect the vehicle exhaust system to the raw sampling location or dilution stage according to the provisions of this subpart. For dilution systems, dilute the exhaust as described in this subpart. Continuous sampling systems must meet the specifications provided in this subpart.

(2) Test the vehicle in a fully warmed-up condition. If the vehicle has soaked for two hours or less since the last exhaust test element, precondi-

tioning may consist of a 505 Cycle, 866 Cycle, US06, or SC03, as these terms are defined in § 86.1803-01, or a highway fuel economy test procedure, as defined in § 600.002-08 of this chapter. For soak periods longer than two hours, precondition the vehicle using one full Urban Dynamometer Driving Schedule. Ensure that the vehicle has stabilized at test cell ambient conditions such that the vehicle interior temperature is not substantially different from the external test cell temperature. Windows may be opened during preconditioning to achieve this stabilization.

(3) Immediately after the preconditioning, turn off any cooling fans, if present, close the vehicle's hood, fully close all the vehicle's windows, ensure that all the vehicle's air conditioning systems are set to full off, start the CO₂ sampling system, and then idle the vehicle for not less than 1 minute and not more than 5 minutes to achieve normal and stable idle operation.

(4) Measure and record the continuous CO₂ concentration for 600 seconds. Measure the CO₂ concentration continuously using raw or dilute sampling procedures. Multiply this concentration by the continuous (raw or dilute) flow rate at the emission sampling location to determine the CO₂ flow rate. Calculate the CO₂ cumulative flow rate continuously over the test interval. This cumulative value is the total mass of the emitted CO₂. Alternatively, CO₂ may be measured and recorded using a constant velocity sampling system as described in §§ 86.106-96(a)(2) and 86.109.

(5) Within 60 seconds after completing the measurement described in paragraph (d)(4) of this section, turn on the vehicle's air conditioning system. Set automatic air conditioning systems to a temperature 9 °F (5 °C) below the ambient temperature of the test cell. Set manual air conditioning systems to maximum cooling with recirculation turned off, except that recirculation shall be enabled if the air conditioning system automatically defaults to a recirculation mode when set to maximum cooling. Continue idling the vehicle while measuring and recording the continuous CO₂ concentration for 600 seconds as described in paragraph (d)(4) of this section. Air

conditioning systems with automatic temperature controls are finished with the test after this 600 second idle period. Manually controlled air conditioning systems must complete one additional idle period as described in paragraph (d)(6) of this section.

(6) This paragraph (d)(6) applies only to manually controlled air conditioning systems. Within 60 seconds after completing the measurement described in paragraph (d)(5) of this section, leave the vehicle's air conditioning system on and set as described in paragraph (d)(5) of this section but set the fan speed to the lowest setting that continues to provide air flow. Recirculation shall be turned off except that if the system defaults to a recirculation mode when set to maximum cooling and maintains recirculation with the low fan speed, then recirculation shall continue to be enabled. After the fan speed has been set, continue idling the vehicle while measuring and recording the continuous CO₂ concentration for a total of 600 seconds as described in paragraph (d)(4) of this section.

(e) *Calculations.* (1) For the measurement with no air conditioning operation, calculate the CO₂ emissions (in grams per minute) by dividing the total mass of CO₂ from paragraph (d)(4) of this section by 10.0 (the duration in minutes for which CO₂ is measured). Round this result to the nearest tenth of a gram per minute.

(2)(1) For the measurement with air conditioning in operation for automatic air conditioning systems, calculate the CO₂ emissions (in grams per minute) by dividing the total mass of CO₂ from paragraph (d)(5) of this section by 10.0. Round this result to the nearest tenth of a gram per minute.

(ii) For the measurement with air conditioning in operation for manually controlled air conditioning systems, calculate the CO₂ emissions (in grams per minute) by summing the total mass of CO₂ from paragraphs (d)(5) and (d)(6) of this section and dividing by 20.0. Round this result to the nearest tenth of a gram per minute.

(3) Calculate the increased CO₂ emissions due to air conditioning (in grams per minute) by subtracting the results of paragraph (e)(1) of this section from

the results of paragraph (e)(2)(i) or (ii) of this section, whichever is applicable.

(f) The Administrator may prescribe procedures other than those in this section for air conditioning systems and/or vehicles that may not be susceptible to satisfactory testing by the procedures and methods in this section. For example, the Administrator may prescribe alternative air conditioning system settings for systems with controls that are not able to meet the requirements in this section.

[75 FR 25680, May 7, 2010, as amended at 76 FR 39521, July 6, 2011; 77 FR 63152, Oct. 15, 2012]

§ 86.166–12 [Reserved]

Subpart C—Emission Regulations for 1994 and Later Model Year Gasoline-Fueled New Light-Duty Vehicles, New Light-Duty Trucks and New Medium-Duty Passenger Vehicles; Cold Temperature Test Procedures

SOURCE: 79 FR 23698, Apr. 28, 2014, unless otherwise noted.

§ 86.201 General applicability.

(a) Vehicles are subject to cold temperature testing requirements as described in subpart S of this part and 40 CFR part 600. Perform testing to measure CO and NMHC emissions and determine fuel economy as described in 40 CFR part 1066; see especially 40 CFR 1066.710.

(b) Perform intermediate temperature testing as follows:

(1) For testing during ambient temperatures of less than 50 °F (10 °C), perform testing as described in 40 CFR part 1066, subpart H.

(2) For testing at temperatures of 50 °F (10 °C) or higher, perform FTP testing as described in 40 CFR part 1066.

(c) Through model year 2021, manufacturers may certify vehicles based on data collected according to previously published cold temperature and intermediate temperature testing procedures. In addition, we may approve the use of previously published cold temperature and intermediate temperature testing procedures for later model