

accommodate dispensing rates. The vehicle test for spitback consists of a short drive followed immediately by a complete refueling event. This test is not required for gaseous-fueled vehicles.

(f) The element of the SFTP for exhaust emissions related to aggressive driving (US06) is designed to determine gaseous THC, NMHC, CO, CO<sub>2</sub>, CH<sub>4</sub>, and NO<sub>x</sub> emissions from gasoline-fueled or diesel-fueled vehicles (see § 86.158–08 Supplemental test procedures; overview, and § 86.159–08 Exhaust emission test procedures for US06 emissions). The test cycle simulates urban driving speeds and accelerations that are not represented by the FTP Urban Dynamometer Driving Schedule simulated trips discussed in paragraph (b) of this section. The test consists of vehicle operation on a chassis dynamometer through a specified driving cycle (see paragraph (g), US06 Dynamometer Driving Schedule, of appendix I to this part). A proportional part of the diluted exhaust is collected continuously for subsequent analysis, using a constant volume (variable dilution) sampler or critical flow venturi sampler.

(g)(1) The element of the SFTP related to the increased exhaust emissions caused by air conditioning operation (SC03) is designed to determine gaseous THC, NMHC, CO, CO<sub>2</sub>, CH<sub>4</sub>, and NO<sub>x</sub> emissions from gasoline-fueled or diesel-fueled vehicles related to air conditioning use (see § 86.158–08 Supplemental Federal test procedures; overview and § 86.160–00 Exhaust emission test procedure for SC03 emissions). The test cycle simulates urban driving behavior with the air conditioner operating. The test consists of engine startups and vehicle operation on a chassis dynamometer through specified driving cycles (see paragraph (h), SC03 Dynamometer Driving Schedule, of appendix I to this part). A proportional part of the diluted exhaust is collected continuously for subsequent analysis, using a constant volume (variable dilution) sampler or critical flow venturi sampler. The testing sequence includes an approved preconditioning cycle, a 10 minute soak with the engine turned off, and the SC03 cycle with measured exhaust emissions.

(2) The SC03 air conditioning test is conducted with the air conditioner operating at specified settings and the ambient test conditions of:

- (i) Air temperature of 95 °F;
- (ii) 100 grains of water/pound of dry air (approximately 40 percent relative humidity);
- (iii) Simulated solar heat intensity of 850 W/m<sup>2</sup> (see § 86.161–00(d)); and
- (iv) Air flow directed at the vehicle that will provide representative air conditioner system condenser cooling at all vehicle speeds (see § 86.161–00(e)).

(3) Manufacturers have the option of simulating air conditioning operation during testing at other ambient test conditions provided they can demonstrate that the vehicle tail pipe exhaust emissions are representative of the emissions that would result from the SC03 cycle test procedure and the ambient conditions of paragraph (g)(2) of this section. The simulation test procedure must be approved in advance by the Administrator (see §§ 86.162–03 and 86.163–00).

(h) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle shall be functioning during all procedures in this subpart. Maintenance to correct component malfunction or failure shall be authorized in accordance with § 86.007–25 or § 86.1834–01 as applicable.

(i) Background concentrations are measured for all species for which emissions measurements are made. For exhaust testing, this requires sampling and analysis of the dilution air. For evaporative testing, this requires measuring initial concentrations. (When testing methanol-fueled vehicles, manufacturers may choose not to measure background concentrations of methanol and/or formaldehyde, and then assume that the concentrations are zero during calculations.)

[75 FR 25678, May 7, 2010]

#### § 86.127–96 Test procedures; overview.

The procedures described in this and subsequent sections are used to determine the conformity of vehicles with the standards set forth in subpart A of this part for light-duty vehicles and light-duty trucks.

## Environmental Protection Agency

## § 86.127-96

(a) The overall test consists of prescribed sequences of fueling, parking, and operating conditions. Vehicles are tested for any or all of the following emissions:

(1) Gaseous exhaust THC, CO, NO<sub>x</sub>, CO<sub>2</sub> (for petroleum-fueled and gaseous-fueled vehicles), plus CH<sub>3</sub>OH and HCHO for methanol-fueled vehicles, plus CH<sub>4</sub> (for vehicles subject to the NMHC and NMHCE standards).

(2) Particulates.

(3) Evaporative HC (for gasoline-fueled, methanol-fueled and gaseous-fueled vehicles) and CH<sub>3</sub>OH (for methanol-fueled vehicles). The evaporative testing portion of the procedure occurs after the exhaust emission test; however, exhaust emissions need not be sampled to complete a test for evaporative emissions.

(4) Fuel spitback (this test is not required for gaseous-fueled vehicles).

(b) The Otto-cycle exhaust emission test is designed to determine gaseous THC, CO, CO<sub>2</sub>, CH<sub>4</sub>, NO<sub>x</sub>, and particulate mass emissions from gasoline-fueled, methanol-fueled and gaseous-fueled Otto-cycle vehicles as well as methanol and formaldehyde from methanol-fueled Otto-cycle vehicles, while simulating an average trip in an urban area of 11 miles (18 kilometers). The test consists of engine start-ups and vehicle operation on a chassis dynamometer through a specified driving schedule. A proportional part of the diluted exhaust is collected continuously for subsequent analysis, using a constant volume (variable dilution) sampler or critical flow venturi sampler.

(c) The diesel-cycle exhaust emission test is designed to determine particulate and gaseous mass emissions during a test similar to the test in § 86.127(b). For petroleum-fueled diesel-cycle vehicles, diluted exhaust is continuously analyzed for THC using a heated sample line and analyzer; the other gaseous emissions (CH<sub>4</sub>, CO, CO<sub>2</sub>, and NO<sub>x</sub>) are collected continuously for analysis as in § 86.127(b). For methanol-fueled vehicles, THC, methanol, formaldehyde, CO, CO<sub>2</sub>, CH<sub>4</sub>, and NO<sub>x</sub> are collected continuously for analysis as in § 86.127(b). THC, methanol, and formaldehyde are collected using heated sample lines, and a heated FID is used for THC analyses. Simultaneous with

the gaseous exhaust collection and analysis, particulates from a proportional part of the diluted exhaust are collected continuously on a filter. The mass of particulate is determined by the procedure described in § 86.139. This testing requires a dilution tunnel as well as the constant volume sampler.

(d) The evaporative emission test (gasoline-fueled vehicles, methanol-fueled and gaseous-fueled vehicles) is designed to determine hydrocarbon and methanol evaporative emissions as a consequence of diurnal temperature fluctuation, urban driving and hot soaks following drives. It is associated with a series of events that a vehicle may experience and that may result in hydrocarbon and/or methanol vapor losses. The test procedure is designed to measure:

(1) Diurnal emissions resulting from daily temperature changes (as well as relatively constant resting losses), measured by the enclosure technique (see § 86.133);

(2) Running losses resulting from a simulated trip performed on a chassis dynamometer, measured by the enclosure or point-source technique (see § 86.134; this test is not required for gaseous-fueled vehicles); and

(3) Hot soak emissions, which result when the vehicle is parked and the hot engine is turned off, measured by the enclosure technique (see § 86.138).

(e) Fuel spitback emissions occur when a vehicle's fuel fill neck cannot accommodate dispensing rates. The vehicle test for spitback consists of a short drive followed immediately by a complete refueling event. This test is not required for gaseous-fueled vehicles.

(f) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle shall be functioning during all procedures in this subpart. Maintenance to correct component malfunction or failure shall be authorized in accordance with § 86.090-25.

(g) Background concentrations are measured for all species for which emissions measurements are made. For exhaust testing, this requires sampling and analysis of the dilution air. For evaporative testing, this requires

measuring initial concentrations. (When testing methanol-fueled vehicles, manufacturers may choose not to measure background concentrations of methanol and/or formaldehyde, and then assume that the concentrations are zero during calculations.)

[58 FR 16032, Mar. 24, 1993, as amended at 59 FR 48508, Sept. 21, 1994; 60 FR 34347, June 30, 1995]

**§ 86.128-00 Transmissions.**

Section 86.128-00 includes text that specifies requirements that differ from § 86.128-79. Where a paragraph in § 86.128-79 is identical and applicable to § 86.128-00, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.128-79.”

(a)-(c) [Reserved]. For guidance see § 86.128-79.

(d) The vehicle shall be driven with appropriate accelerator pedal movement necessary to achieve the speed versus time relationship prescribed by the driving schedule. Both smoothing of speed variations and excessive accelerator pedal perturbations are to be avoided.

(e)-(h) [Reserved]. For guidance see § 86.128-79.

[61 FR 54892, Oct. 22, 1996]

**§ 86.128-79 Transmissions.**

(a) All test conditions, except as noted, shall be run according to the manufacturer’s recommendations to the ultimate purchaser, *Provided, That:* Such recommendations are representative of what may reasonably be expected to be followed by the ultimate purchaser under in-use conditions.

(b) Vehicles equipped with free wheeling or overdrive, except as noted, shall be tested with these features operated according to the manufacturer’s recommendations to the ultimate purchaser.

(c) Idle modes less than one minute in length shall be run with automatic transmissions in “Drive” and the wheels braked; manual transmissions shall be in gear with the clutch disengaged, except for the first idle mode (see §§ 86.134, 86.136, and 86.137). The first idle mode and idle modes longer than one minute in length may be run

with automatic transmissions in “Neutral;” manual transmissions may be in “Neutral” with the clutch engaged (clutch may be disengaged for engine start-up). If an automatic transmission is in “Neutral” during an idle mode, it shall be placed in “Drive” with the wheels braked at least 5 seconds before the end of the idle mode. If a manual transmission is in “Neutral” during an idle mode, it shall be placed in gear with the clutch disengaged at least 5 seconds before the end of the idle mode.

(d) The vehicle shall be driven with minimum accelerator pedal movement to maintain the desired speed.

(e) Accelerations shall be driven smoothly following representative shift speeds and procedures. For manual transmissions, the operator shall release the accelerator pedal during each shift and accomplish the shift with minimum time. If the vehicle cannot accelerate at the specified rate, the vehicle shall be operated at maximum available power until the vehicle speed reaches the value prescribed for that time in the driving schedule.

(f) The deceleration modes shall be run in gear using brakes or accelerator pedal as necessary to maintain the desired speed. Manual transmission vehicles shall have the clutch engaged and shall not change gears from the previous mode. For those modes which decelerate to zero, manual transmission clutches shall be depressed when the speed drops below 15 mph (24.1 km/h), when engine roughness is evident, or when engine stalling is imminent.

(g)(1) In the case of test vehicles equipped with manual transmissions, the transmission shall be shifted in accordance with procedures which are representative of shift patterns that may reasonably be expected to be followed by vehicles in use, in terms of such variables as vehicle speed or percent rated engine speed. At the Administrator’s discretion, a test vehicle may also be shifted according to the shift procedures recommended by the manufacturer to the ultimate purchaser, if such procedures differ from those which are reasonably expected to be followed by vehicles in use.