

§ 86.1801-01

section. Instructions for installing the labels according to the requirements of this section shall be provided with each label.

(b) The label installation instructions shall indicate the following information.

(1) For light-duty vehicles, light-duty trucks, and heavy-duty engines, the label should be affixed in a readily visible position in the engine compartment and beside (to the extent possible) the existing label which is required under § 86.079-35.

(2) For motorcycles, the label should be affixed in a readily accessible position and beside (to the extent possible) the existing label which is required under § 86.413-78(a)(1).

(3) The instructions shall also indicate that the label should not be affixed to any equipment that can be easily detached from the vehicle.

(c) The label must be constructed such that if installed properly, it cannot be removed without destroying or defacing the label.

(d) The label shall contain the following information lettered in the English language in block letters and numerals, which must be of a color that contrasts with the background of the label:

(1) The label heading: Vehicle Emission Control Information Update;

(2) Full corporate name and trademark of the vehicle manufacturer;

(3) The statement: "This vehicle has been (adjusted) (modified) to improve emission control performance when operated at (high) (low) altitude";

(4) Information on where altitude performance adjustment instructions may be obtained or include the actual altitude performance adjustment instructions;

(5) The new tuneup specifications (if changed from the original label specifications) at the applicable altitude.

Subpart R [Reserved]

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

Subpart S—General Compliance Provisions for Control of Air Pollution From New and In-Use Light-Duty Vehicles, Light-Duty Trucks, and Complete Otto-Cycle Heavy-Duty Vehicles

SOURCE: 64 FR 23925, May 4, 1999, unless otherwise noted.

§ 86.1801-01 Applicability.

(a) *Applicability.* Except as otherwise indicated, the provisions of this subpart apply to new 2001 and later model year Otto-cycle and diesel cycle light-duty vehicles, light-duty trucks, medium-duty passenger vehicles, and 2005 and later model year Otto-cycle complete heavy-duty vehicles (2003 or 2004 model year for manufacturers choosing Otto-cycle HDE option 1 or 2, respectively, in § 86.005-1(c)) including multi-fueled, alternative fueled, hybrid electric, and zero emission vehicles. These provisions also apply to 2001 model year and later new incomplete light-duty trucks below 8,500 Gross Vehicle Weight Rating, and to 2001 and later model year Otto-cycle complete heavy-duty vehicles participating in the provisions of the averaging, trading, and banking program under the provisions of § 86.1817-05(n). In cases where a provision applies only to a certain vehicle group based on its model year, vehicle class, motor fuel, engine type, or other distinguishing characteristics, the limited applicability is cited in the appropriate section of this subpart.

(b) *Clean alternative fuel conversions.* The provisions of the subpart apply to clean alternative fuel conversions as defined in 40 CFR 85.502, of all model year light-duty vehicles, light-duty trucks, medium duty passenger vehicles, and complete Otto-cycle heavy-duty vehicles.

(c) *Optional applicability.* (1) A manufacturer may request to certify any Otto-cycle heavy-duty vehicle of 14,000 pounds Gross Vehicle Weight Rating or less in accordance with the light-duty truck provisions through the 2004 model year (2002 model year for manufacturers choosing Otto-cycle HDE option 1 in § 86.005-1(c) or 2003 model year for manufacturers choosing Otto-cycle

HDE option 2 in § 86.005-1(c)). Heavy-duty engine or heavy-duty vehicle provisions of subpart A of this part do not apply to such a vehicle. A 2004 model year heavy-duty vehicle optionally certified as a light-duty truck under this provision must comply with all provisions applicable to MDPVs including exhaust and evaporative emission standards, test procedures, on-board diagnostics, refueling standards, phase-in requirements and fleet average standards under 40 CFR part 85 and this part.

(2) Beginning with the 2001 model year, a manufacturer may request to certify any incomplete Otto-cycle heavy-duty vehicle of 14,000 pounds Gross Vehicle Weight Rating or less in accordance with the provisions for complete heavy-duty vehicles. Heavy-duty engine or heavy-duty vehicle provisions of subpart A of this part do not apply to such a vehicle.

(3) A manufacturer may optionally use the provisions of this subpart in lieu of the provisions of subpart A beginning with the 2000 model year for light-duty vehicles and light-duty trucks. Manufacturers choosing this option must comply with all provisions of this subpart. Manufacturers may elect this provision for either all or a portion of their product line.

(4) Upon preapproval by the Administrator, a manufacturer may optionally certify a clean alternative fuel conversion of a complete heavy-duty vehicle greater than 10,000 pounds Gross Vehicle Weight Rating and of 14,000 pounds Gross Vehicle Weight Rating or less under the heavy-duty engine or heavy-duty vehicle provisions of subpart A of this part. Such preapproval will be granted only upon demonstration that chassis-based certification would be infeasible or unreasonable for the manufacturer to perform.

(5) A manufacturer may optionally certify a clean alternative fuel conversion of a complete heavy-duty vehicle greater than 10,000 pounds Gross Vehicle Weight Rating and of 14,000 pounds Gross Vehicle Weight Rating or less under the heavy-duty engine or heavy-duty vehicle provisions of subpart A of this part without advance approval from the Administrator if the vehicle was originally certified to the heavy-

duty engine or heavy-duty vehicle provisions of subpart A of this part.

(d) *Small volume manufacturers.* Special certification procedures are available for any manufacturer whose projected or actual combined sales in all states and territories of the United States of light-duty vehicles, light-duty trucks, heavy-duty vehicles, and heavy-duty engines in its product line (including all vehicles and engines imported under the provisions of 40 CFR 85.1505 and 85.1509) are fewer than 15,000 units for the model year in which the manufacturer seeks certification. The small volume manufacturer's light-duty vehicle and light-duty truck certification procedures and described in § 86.1838-01.

(e) *National Low Emission Vehicle Program for light-duty vehicles and light light-duty trucks.* A manufacturer may elect to certify 2001-2003 model year light-duty vehicles and light light-duty trucks (LDV/LLDTs) to the provisions of the National Low Emission Vehicle Program contained in subpart R of this part. Subpart R of this part is applicable only to those covered manufacturers as defined under the provisions of subpart R of this part. All provisions of this subpart S are applicable to vehicles certified pursuant to subpart R of this part, except as specifically noted in subpart R of this part.

(f) *"Early" Tier 2 LDVs, LDTs and MDPVs.* Any LDV/LLDT which is certified to Tier 2 FTP exhaust standards prior to the 2004 model year, or any HLDT or MDPV which is certified to the Tier 2 FTP exhaust standards prior to the 2008 model year, to utilize alternate phase-in schedules and/or for purposes of generating and banking Tier 2 NO_x credits, must comply with all the exhaust emission requirements applicable to Tier 2 LDV/LLDTs or HLDT/MDPVs, as applicable, under this subpart.

(g) *Interim non-Tier 2 LDVs, LDTs and MDPVs.* Model year 2004-2008 LDVs, LDTs and MDPVs, that do not comply with the Tier 2 FTP exhaust emission requirements (interim non-Tier 2 LDV/LLDTs and interim non-Tier 2 HLDT/MDPVs) as permitted under the phase-in requirements of § 86.1811-04(k) must comply with all applicable interim

non-Tier 2 exhaust emission requirements contained in this subpart, including FTP exhaust emission requirements for all interim non-Tier 2 LDV/LLDTs and HLD/MDPVs found at § 86.1811-04(l). Additional emission bins and separate fleet average NO_x emission standards and other provisions are provided for interim non-Tier 2 LDV/LLDTs, and interim non-Tier 2 HLD/MDPVs.

(h) *Applicability of provisions of this subpart to LDVs, LDTs, MDPVs and HDVs.* Numerous sections in this subpart provide requirements or procedures applicable to a “vehicle” or “vehicles.” Unless otherwise specified or otherwise determined by the Administrator, the term “vehicle” or “vehicles” in those provisions apply equally to LDVs, LDTs, MDPVs and HDVs.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6851, Feb. 10, 2000; 65 FR 59963, Oct. 6, 2000; 67 FR 72825, Dec. 6, 2002; 76 FR 19873, Apr. 8, 2011]

§ 86.1801-12 Applicability.

(a) *Applicability.* The provisions of this subpart apply to certain types of new vehicles as described in this paragraph (a). Where the provisions apply for a type of vehicle, they apply for vehicles powered by any fuel, unless otherwise specified. In some cases, manufacturers of heavy-duty engines and vehicles can choose whether to meet the requirements of this subpart or the requirements of subpart A of this part; those provisions are therefore considered optional, but only to the extent that manufacturers comply with the other set of requirements. In cases where a provision applies only to a certain vehicle group based on its model year, vehicle class, motor fuel, engine type, or other distinguishing characteristics, the limited applicability is cited in the appropriate section. References in this subpart to 40 CFR part 86 generally apply to Tier 2 and older vehicles, while references to 40 CFR part 1066 generally apply to Tier 3 and newer vehicles; see 40 CFR 86.101 for detailed provisions related to this transition. The provisions of this subpart apply to certain vehicles as follows:

(1) The provisions of this subpart apply for light-duty vehicles and light-duty trucks.

(2) The provisions of this subpart apply for medium-duty passenger vehicles. The provisions of this subpart also apply for other complete heavy-duty vehicles at or below 14,000 pounds GVWR, except as follows:

(i) The provisions of this subpart are optional for diesel-cycle vehicles through model year 2017; however, if you are using the provisions of § 86.1811-17(b)(9) or § 86.1816-18(b)(8) to transition to the Tier 3 exhaust emission standards, the provisions of this subpart are optional for those diesel-cycle vehicles until the start of the Tier 3 phase-in for those vehicles.

(ii) Greenhouse gas emission standards apply as specified in 40 CFR parts 1036 and 1037 instead of the standards specified in this subpart.

(3) The provisions of this subpart generally do not apply to incomplete heavy-duty vehicles or to complete vehicles above 14,000 pounds GVWR (see subpart A of this part and 40 CFR part 1037). However, this subpart applies to such vehicles in the following cases:

(i) Heavy duty vehicles above 14,000 pounds GVWR and all sizes of incomplete heavy-duty vehicles may be optionally certified to the exhaust emission standards in this subpart that apply for heavy-duty vehicles.

(ii) The evaporative emission standards apply for incomplete heavy-duty vehicles at or below 14,000 pounds GVWR. Evaporative emission standards also apply for complete and incomplete heavy-duty vehicles above 14,000 pounds GVWR as specified in 40 CFR 1037.103.

(iii) Refueling emission standards apply for complete heavy-duty vehicles above 14,000 pounds GVWR as specified in 40 CFR 1037.103. All sizes of incomplete heavy-duty vehicles may be optionally certified to the refueling emission standards in this subpart.

(iv) The onboard diagnostic requirements in this subpart apply for incomplete vehicles at or below 14,000 pounds GVWR, but not for any vehicles above 14,000 pounds GVWR.

(4) The provisions of this subpart are optional for diesel-fueled Class 3 heavy-duty vehicles in a given model year if those vehicles are equipped with engines certified to the appropriate standards in § 86.007-11 for which less

than half of the engine family's sales for the model year in the United States are for complete Class 3 heavy-duty vehicles. This includes engines sold to all vehicle manufacturers. If you are the original manufacturer of the engine and the vehicle, base this showing on your sales information. If you manufacture the vehicle but are not the original manufacturer of the engine, you must use your best estimate of the original manufacturer's sales information.

(5) If you optionally certify vehicles to standards under this subpart, those vehicles are subject to all the regulatory requirements as if the standards were mandatory.

(b) *Relationship to subpart A of this part.* Unless specified otherwise, if heavy-duty vehicles are not subject to provisions of this subpart or if manufacturers choose not to meet optional provisions of this subpart as described in paragraph (a) of this section, the engines installed in those vehicles must meet the corresponding requirements under subpart A of this part. If a vehicle and its installed engine comply with a mix of provisions from this subpart and from subpart A of this part, the vehicle must be certified under this subpart, and the engine does not need to be certified separately.

(c) *Clean alternative fuel conversions.* The provisions of this subpart also apply to clean alternative fuel conversions as defined in 40 CFR 85.502 of all vehicles described in paragraph (a) of this section.

(d) *Small-volume manufacturers.* Special certification procedures are available for small-volume manufacturers as described in § 86.1838.

(e) *You.* The term “you” in this subpart refers to manufacturers subject to the emission standards and other requirements of this subpart.

(f) *Vehicle.* The term “vehicle”, when used generically, does not exclude any type of vehicle for which the regulations apply (such as light-duty trucks).

(g) *Complete and incomplete vehicles.* Several provisions in this subpart, including the applicability provisions described in this section, are different for complete and incomplete vehicles. We differentiate these vehicle types as described in § 86.085–20.

(h) *Applicability of provisions of this subpart to light-duty vehicles, light-duty trucks, medium-duty passenger vehicles, and heavy-duty vehicles.* Numerous sections in this subpart provide requirements or procedures applicable to a “vehicle” or “vehicles.” Unless otherwise specified or otherwise determined by the Administrator, the term “vehicle” or “vehicles” in those provisions apply equally to light-duty vehicles (LDVs), light-duty trucks (LDTs), medium-duty passenger vehicles (MDPVs), and heavy-duty vehicles (HDVs), as those terms are defined in § 86.1803–01.

(i) *Applicability of provisions of this subpart to exhaust greenhouse gas emissions.* Numerous sections in this subpart refer to requirements relating to “exhaust emissions.” Unless otherwise specified or otherwise determined by the Administrator, the term “exhaust emissions” refers at a minimum to emissions of all pollutants described by emission standards in this subpart, including carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄).

(j) *Exemption from greenhouse gas emission standards for small businesses.* (1) Manufacturers that qualify as a small business under the Small Business Administration regulations in 13 CFR part 121 are exempt from the greenhouse gas emission standards specified in § 86.1818–12 and in associated provisions in this part and in part 600 of this chapter. This exemption applies to both U.S.-based and non-U.S.-based businesses. The following categories of businesses (with their associated NAICS codes) may be eligible for exemption based on the Small Business Administration size standards in 13 CFR 121.201.

(i) Vehicle manufacturers (NAICS code 336111).

(ii) Independent commercial importers (NAICS codes 811111, 811112, 811198, 423110, 424990, and 441120).

(iii) Alternate fuel vehicle converters (NAICS codes 335312, 336312, 336322, 336399, 454312, 485310, and 811198).

(2)(i) Effective for the 2013 and later model years, a manufacturer that would otherwise be exempt under the provisions of paragraph (j)(1) of this section may optionally comply with the greenhouse gas emission standards specified in § 86.1818. A manufacturer

making this choice is required to comply with all the applicable standards and provisions in § 86.1818 and with all associated and applicable provisions in this part and in part 600 of this chapter.

(ii) Such a manufacturer may optionally earn credits in the 2012 model year by demonstrating fleet average CO₂ emission levels below the fleet average CO₂ standard that would have been applicable in model year 2012 if the manufacturer had not been exempt. Once the small business manufacturer opting into the greenhouse gas emission standards completes certification for the 2013 model year, that manufacturer will be eligible to generate greenhouse gas emission credits for their 2012 model year production, after the conclusion of the 2012 model year for that manufacturer. Manufacturers electing to earn these 2012 credits must comply with the model year reporting requirements in § 600.512-12 for that model year. The 2012 fleet average must be calculated according to § 600.510 and other applicable requirements in part 600 of this chapter, and 2012 credits must be calculated according to § 86.1865 and other applicable requirements in this part.

(k) *Conditional exemption from greenhouse gas emission standards.* Manufacturers meeting the eligibility requirements described in paragraphs (k)(1) and (2) of this section may request a conditional exemption from compliance with the emission standards described in § 86.1818-12(c) through (e) and associated provisions in this part and in part 600 of this chapter. A conditional exemption under this paragraph (k) may be requested for the 2012 through 2016 model years. The terms “sales” and “sold” as used in this paragraph (k) shall mean vehicles produced for U.S. sale, where “U.S.” means the states and territories of the United States. For the purpose of determining eligibility the sales of related companies shall be aggregated according to the provisions of § 86.1838-01(b)(3) or, if a manufacturer has been granted operational independence status under § 86.1838(d), eligibility shall be based on vehicle production of that manufacturer.

(1) *Eligibility requirements.* Eligibility as determined in this paragraph (k) shall be based on the total sales of combined passenger automobiles and light trucks. Manufacturers must meet one of the requirements in paragraph (k)(1)(i) or (ii) of this section to initially qualify for this exemption.

(i) A manufacturer with 2008 or 2009 model year sales of more than zero and fewer than 5,000 is eligible for a conditional exemption from the greenhouse gas emission standards described in § 86.1818-12 paragraphs (c) through (e).

(ii) A manufacturer with 2008 or 2009 model year sales of more than zero and fewer than 5,000 while under the control of another manufacturer, where those 2008 or 2009 model year vehicles bore the brand of the producing manufacturer but were sold by or otherwise under the control of another manufacturer, and where the manufacturer producing the vehicles became independent no later than December 31, 2010, is eligible for a conditional exemption from the greenhouse gas emission standards described in § 86.1818-12 paragraphs (c) through (e).

(2) *Maintaining eligibility for exemption from greenhouse gas emission standards.* To remain eligible for exemption under this paragraph (k) the manufacturer's average sales for the three most recent consecutive model years must remain below 5,000. If a manufacturer's average sales for the three most recent consecutive model years exceeds 4999, the manufacturer will no longer be eligible for exemption and must meet applicable emission standards according to the provisions in this paragraph (k)(2).

(i) If a manufacturer's average sales for three consecutive model years exceeds 4999, and if the increase in sales is the result of corporate acquisitions, mergers, or purchase by another manufacturer, the manufacturer shall comply with the emission standards described in § 86.1818-12 paragraphs (c) through (e), as applicable, beginning with the first model year after the last year of the three consecutive model years.

(ii) If a manufacturer's average sales for three consecutive model years exceeds 4999 and is less than 50,000, and if the increase in sales is solely the result

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of the manufacturer's expansion in vehicle production, the manufacturer shall comply with the emission standards described in § 86.1818–12 paragraphs (c) through (e), as applicable, beginning with the second model year after the last year of the three consecutive model years.

(iii) If a manufacturer's average sales for three consecutive model years exceeds 49,999, the manufacturer shall comply with the emission standards described in § 86.1818–12 paragraphs (c) through (e), as applicable, beginning with the first model year after the last year of the three consecutive model years.

(3) *Requesting the conditional exemption from standards.* To be exempted from the standards described in § 86.1818–12(c) through (e), the manufacturer must submit a declaration to EPA containing a detailed written description of how the manufacturer qualifies under the provisions of this paragraph (k). The declaration must describe eligibility information that includes the following: model year 2008 and 2009 sales, sales volumes for each of the most recent three model years, detailed information regarding ownership relationships with other manufacturers, details regarding the application of the provisions of § 86.1838–01(b)(3) regarding the aggregation of sales of related companies, and documentation of good-faith efforts made by the manufacturer to purchase credits from other manufacturers. This declaration must be signed by a chief officer of the company, and must be made prior to each model year for which the exemption is requested. The declaration must be submitted to EPA at least 30 days prior to the introduction into commerce of any vehicles for each model year for which the exemption is requested, but not later than December of the calendar year prior to the model year for which exemption is requested. A conditional exemption will be granted when EPA approves the exemption declaration. The declaration must be sent to the Environmental Protection Agency at the following address: Director, Compliance and Innovative Strategies Division, U.S. Environmental Protec-

tion Agency, 2000 Traverwood Drive, Ann Arbor, Michigan 48105.

[75 FR 25682, May 7, 2010, as amended at 76 FR 19873, Apr. 8, 2011; 77 FR 63155, Oct. 15, 2012; 79 FR 23706, Apr. 28, 2014]

§ 86.1802–01 Section numbering; construction.

(a) *Section numbering.* The model year of initial applicability is indicated by the section number. The two digits following the hyphen designate the first model year for which a section is applicable. The section continues to apply to subsequent model years unless a later model year section is adopted. Example: Section 86.18xx–01 applies to the 2001 and subsequent model years. If a § 86.18xx–03 is promulgated it would apply beginning with the 2003 model year; § 86.18xx–01 would apply to model years 2001 through 2002.

(b) A section reference without a model year suffix refers to the section applicable for the appropriate model year.

§ 86.1803–01 Definitions.

The following definitions apply to this subpart:

505 Cycle means the test cycle that consists of the first 505 seconds (seconds 1 to 505) of the EPA Urban Dynamometer Driving Schedule, described in § 86.115–00 and listed in appendix I, paragraph (a), of this part.

866 Cycle means the test cycle that consists of the last 866 seconds (seconds 506 to 1372) of the EPA Urban Dynamometer Driving Schedule, described in § 86.115–00 and listed in appendix I, paragraph (a), of this part.

Abnormally treated vehicle means any diesel light-duty vehicle or diesel light-duty truck that is operated for less than five miles in a 30 day period immediately prior to conducting a particulate emissions test.

AC1 means a test procedure as described in § 86.162–00 which simulates testing with air conditioning operating in an environmental test cell by adding the air conditioning compressor load to the normal dynamometer forces.

AC2 means a test procedure as described in § 86.162–00 which simulates testing with air conditioning operating in an environmental test cell by adding

a heat load to the passenger compartment.

Accuracy means the difference between a measurement and true value.

Act means Part A of Title II of the Clean Air Act as amended, 42 U.S.C., 7401, *et seq.*

Adjusted Loaded Vehicle Weight means the numerical average of vehicle curb weight and gross vehicle weight rating (GVWR).

Administrator means the Administrator of the Environmental Protection Agency or his/her authorized representative.

Air Conditioning Idle Test means the test procedure specified in § 86.165-12.

Air conditioning system means a unique combination of air conditioning and climate control components, including: compressor type (*e.g.*, belt, gear, or electric-driven, or a combination of compressor drive mechanisms); compressor refrigerant capacity; the number and type of rigid pipe and flexible hose connections; the number of high side service ports; the number of low side service ports; the number of switches, transducers, and expansion valves; the number of TXV refrigerant control devices; the number and type of heat exchangers, mufflers, receiver/dryers, and accumulators; and the length and type of flexible hose (*e.g.*, rubber, standard barrier or veneer, ultra-low permeation).

Alternative fuels means any fuel other than gasoline and diesel fuels, such as methanol, ethanol, and gaseous fuels.

Ambulance means a vehicle used for emergency medical care that provides all of the following:

- (1) A driver's compartment.
- (2) A patient compartment to accommodate an emergency medical services provider and one patient located on the primary cot so positioned that the primary patient can be given intensive life-support during transit.
- (3) Equipment and supplies for emergency care at the scene as well as during transport.
- (4) Safety, comfort, and avoidance of aggravation of the patient's injury or illness.
- (5) Two-way radio communication.
- (6) Audible and visual traffic warning devices.

Approach angle means the smallest angle in a plan side view of an automobile, formed by the level surface on which the automobile is standing and a line tangent to the front tire static loaded radius arc and touching the underside of the automobile forward of the front tire.

As-received condition means the condition of an in-use vehicle procured for emission testing required by this subpart upon which no adjustments, maintenance, or component replacement has occurred subsequent to the vehicle's last routine operation by the vehicle's owner, lessee, or operator prior to procurement.

Auxiliary Emission Control Device (AECD) means any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.

Averaging for chassis-bases heavy-duty vehicles means the exchange of NO_x emission credits among test groups within a given manufacturer's product line.

Averaging set means a subcategory of complete heavy-duty vehicles within which test groups can average and trade emission credits with one another.

Axle clearance means the vertical distance from the level surface on which an automobile is standing to the lowest point on the axle differential of the automobile.

Banking means one of the following:

- (1) The retention of NO_x emission credits for complete heavy-duty vehicles by the manufacturer generating the emission credits, for use in future model year certification programs as permitted by regulation.
- (2) The retention of cold temperature non-methane hydrocarbon (NMHC) emission credits for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles by the manufacturer generating the emission credits, for use in future model year certification programs as permitted by regulation.
- (3) The retention of NO_x emission credits for light-duty vehicles, light-

duty trucks, and medium-duty passenger vehicles for use in future model year certification programs as permitted by regulation.

(4) The retention of CO₂ emission credits for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles for use in future model year certification programs as permitted by regulation.

Base level has the meaning given in § 600.002-08 of this chapter.

Base tire has the meaning given in § 600.002-08 of this chapter.

Base vehicle has the meaning given in § 600.002-08 of this chapter.

Basic engine has the meaning given in § 600.002-08 of this chapter.

Basic vehicle frontal area means the area enclosed by the geometric projection of the basic vehicle along the longitudinal axis, which includes tires but excludes mirrors and air deflectors, onto a plane perpendicular to the longitudinal axis of the vehicle.

Bi-directional control means the capability of a diagnostic tool to send messages on the data bus that temporarily overrides the module's control over a sensor or actuator and gives control to the diagnostic tool operator. Bi-directional controls do not create permanent changes to engine or component calibrations.

Bin or *emission bin* means a set of emission standards applicable to exhaust pollutants measured on the Federal Test Procedure (FTP). A bin is equivalent to a horizontal row of FTP standards in Tables S04-1 and S04-2 shown in this subpart. Manufacturers are generally free to choose the bin of standards that will apply to a certain test group of vehicles, provided that on a sales weighted average of those bins, all of their vehicles meet a specified fleet average standard for a particular pollutant.

Body style means a level of commonality in vehicle construction as defined by number of doors and roof treatment (e.g., sedan, convertible, fastback, hatchback).

Body type means a name denoting a group of vehicles that are either in the same car line or in different car lines provided the only reason the vehicles qualify to be considered in different car lines is that they are produced by a

separate division of a single manufacturer.

Breakover angle means the supplement of the largest angle, in the plan side view of an automobile, that can be formed by two lines tangent to the front and rear static loaded radii arcs and intersecting at a point on the underside of the automobile.

Calibration means the set of specifications, including tolerances, unique to a particular design, version, or application of a component or components assembly capable of functionally describing its operation over its working range.

Calibration gas means a gas of known concentration which is used to establish the response curve of an analyzer.

CalLEV II or *California LEV II* refers to California's second phase of its low emission vehicle (LEV) program. This program was adopted at the hearing of the California Air Resources Board held on November 5, 1998 and became effective on November 27, 1999.

Candidate in-use vehicle means an in-use vehicle which would be eligible to participate in the in-use verification program in accordance with § 86.1845-01.

Carbon-related exhaust emissions (CREE) has the meaning given in § 600.002-08 of this chapter.

Car line means a name denoting a group of vehicles within a make or car division which has a degree of commonality in construction (e.g., body, chassis). Car line does not consider any level of decor or opulence and is not generally distinguished by characteristics as roofline, number of doors, seats, or windows except for station wagons or light-duty trucks. Station wagons, light-duty trucks, and complete heavy-duty vehicles are considered to be different car lines than passenger cars.

Class 2b means relating to heavy-duty vehicles at or below 10,000 pounds GVWR.

Class 3 means relating to heavy-duty vehicles above 10,000 pounds GVWR and at or below 14,000 pounds GVWR.

Combined CO₂ means the CO₂ value determined for a vehicle (or vehicles) by averaging the city and highway CO₂ values, weighted 0.55 and 0.45 respectively.

Combined CREE means the CREE value determined for a vehicle (or vehicles) by averaging the city and highway fuel CREE values, weighted 0.55 and 0.45 respectively.

Configuration means a subclassification within a test group which is based on engine code, inertia weight class, transmission type and gear ratios, final drive ratio, and other parameters which may be designated by the Administrator.

Conveniently available service facility and spare parts for small-volume manufacturers means that the vehicle manufacturer has a qualified service facility at or near the authorized point of sale or delivery of its vehicles and maintains an inventory of all emission-related spare parts or has made arrangements for the part manufacturers to supply the parts by expedited shipment (e.g., utilizing overnight express delivery service, UPS, etc.).

Crankcase emissions means airborne substances emitted to the atmosphere from any portion of the engine crankcase ventilation or lubrication systems.

Critical emission-related components are those components which are designed primarily for emission control, or whose failure may result in a significant increase in emissions accompanied by no significant impairment (or perhaps even an improvement) in performance, driveability, and/or fuel economy as determined by the Administrator.

Critical emission-related maintenance means that maintenance to be performed on critical emission-related components.

Curb weight means the actual or the manufacturer's estimated weight of the vehicle in operational status with all standard equipment, and weight of fuel at nominal tank capacity, and the weight of optional equipment computed in accordance with § 86.1832-01; incomplete light-duty trucks shall have the curb weight specified by the manufacturer.

Curb-idle means, for manual transmission code motor vehicles, the engine speed with the transmission in neutral or with the clutch disengaged and with the air conditioning system, if present, turned off. For automatic

transmission code motor vehicles, curb-idle means the engine speed with the automatic transmission in the park position (or neutral position if there is no park position), and with the air conditioning system, if present, turned off.

Data stream information means information (i.e., messages and parameters) originated within the vehicle by a module or intelligent sensors (i.e., a sensor that contains and is controlled by its own module) and transmitted between a network of modules and/or intelligent sensors connected in parallel with either one or two communication wires. The information is broadcast over the communication wires for use by other modules (e.g., chassis, transmission, etc.) to conduct normal vehicle operation or for use by diagnostic tools. Data stream information does not include engine calibration related information.

Dedicated vehicle means any motor vehicle engineered and designed to be operated using a single fuel. Flexible fuel vehicles and multi-fuel vehicles are not dedicated vehicles.

Defeat device means an auxiliary emission control device (AECD) that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use, unless:

(1) Such conditions are substantially included in the Federal emission test procedure;

(2) The need for the AECD is justified in terms of protecting the vehicle against damage or accident;

(3) The AECD does not go beyond the requirements of engine starting; or

(4) The AECD applies only for *emergency vehicles* and the need is justified in terms of preventing the vehicle from losing speed, torque, or power due to abnormal conditions of the emission control system, or in terms of preventing such abnormal conditions from occurring, during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, and running out of diesel exhaust fluid for engines that rely on urea-based selective catalytic reduction.

Departure angle means the smallest angle, in a plan side view of a motor vehicle, formed by the level surface on which the motor vehicle is standing and a line tangent to the rear tire static loaded radius arc and touching the underside of the motor vehicle rearward of the rear tire.

Diesel means a type of engine with operating characteristics significantly similar to the theoretical Diesel combustion cycle. The non-use of a throttle during normal operation is indicative of a diesel engine.

Diesel exhaust fluid (DEF) means a liquid compound used in conjunction with selective catalytic reduction to reduce NO_x emissions. *Diesel exhaust fluid* is generally understood to conform to the specifications of ISO 22241.

Dispensed fuel temperature means the temperature (deg. F or deg. C may be used) of the fuel being dispensed into the tank of the test vehicle during a refueling test.

Diurnal breathing losses means diurnal emissions.

Diurnal emissions means evaporative emissions resulting from the daily cycling of ambient temperatures.

Drive train configuration means a unique combination of engine code, transmission configuration, and axle ratio.

Dual fuel vehicle means any motor vehicle engineered and designed to be operated on two different fuels, but not on a mixture of the fuels.

Durability data vehicle means a vehicle used to generate durability data as required in this subpart.

Durability group means the basic classification unit of a manufacturer's product line used for the purpose of selecting a vehicle configuration to demonstrate durability and predict deterioration in accordance with § 86.1822-01.

Durability useful life means the highest useful life mileage out of the set of all useful life mileages that apply to a given vehicle. The durability useful life determines the duration of service accumulation on a durability data vehicle. The determination of durability useful life shall reflect any light-duty truck or complete heavy-duty vehicle alternative useful life periods approved by the Administrator under § 86.1805-01(c). The determination of durability

useful life shall exclude any standard and related useful life mileage for which the manufacturer has obtained a waiver of emission data submission requirements under § 86.1829-01.

Electric vehicle means a motor vehicle that is powered solely by an electric motor drawing current from a rechargeable energy storage system, such as from storage batteries or other portable electrical energy storage devices, including hydrogen fuel cells, provided that:

(1) The vehicle is capable of drawing recharge energy from a source off the vehicle, such as residential electric service; and

(2) The vehicle must be certified to the emission standards of Bin #1 of Table S04-1 in § 86.1811-09(c)(6).

(3) The vehicle does not have an on-board combustion engine/generator system as a means of providing electrical energy.

Element of design means any control system (i.e., computer software, electronic control system, emission control system, computer logic), and/or control system calibrations, and/or the results of systems interaction, and/or hardware items on a motor vehicle or motor vehicle engine.

Emergency vehicle means one of the following:

(1) For the greenhouse gas emission standards in § 86.1818, emergency vehicle means a motor vehicle manufactured primarily for use as an ambulance or combination ambulance-hearse or for use by the U.S. Government or a State or local government for law enforcement.

(2) For the OBD requirements in § 86.1806, emergency vehicle means a motor vehicle manufactured primarily for use in medical response or for use by the U.S. Government or a State or local government for law enforcement or fire protection.

Emission control system is a unique group of emission control devices, auxiliary emission control devices, engine modifications and strategies, and other elements of design designated by the Administrator used to control exhaust emissions of a vehicle.

Emission credits mean the amount of emission reductions or exceedances, by a complete heavy-duty vehicle test

group, below or above the emission standard, respectively. Emission credits below the standard are considered as “positive credits,” while emission credits above the standard are considered as “negative credits.” In addition, “projected credits” refer to emission credits based on the projected U.S. production volume of the test group. “Reserved credits” are emission credits generated within a model year waiting to be reported to EPA at the end of the model year. “Actual credits” refer to emission credits based on actual U.S. production volumes as contained in the end-of-year reports submitted to EPA. Some or all of these credits may be revoked if EPA review of the end of year reports or any subsequent audit actions uncover problems or errors.

Emission-related component means any component which can affect emissions.

Emission-related maintenance means that maintenance which does substantially affect emissions or which is likely to affect the emissions deterioration of the vehicle during normal in-use operation, even if the maintenance is performed at some time other than that which is recommended.

Engine code means a unique combination within a test group of displacement, fuel injection (or carburetor) calibration, choke calibration, distributor calibration, auxiliary emission control devices, and other engine and emission control system components specified by the Administrator. For electric vehicles, engine code means a unique combination of manufacturer, electric traction motor, motor configuration, motor controller, and energy storage device.

Engine warm-up cycle means sufficient vehicle operation such that the coolant temperature has risen by at least 40 deg. F from engine starting and reaches a minimum temperature of 160 deg. F.

Environmental test cell means a test cell capable of wind-speed, solar thermal load, ambient temperature, and humidity control or simulation which meets the requirements of § 86.161-00 for running emission tests with the air conditioning operating.

EPA Enforcement Officer means any officer or employee of the Environmental Protection Agency so des-

ignated in writing by the Administrator (or by his/her designee).

Equivalent test weight means the weight, within an inertia weight class, which is used in the dynamometer testing of a vehicle and which is based on its loaded vehicle weight or adjusted loaded vehicle weight in accordance with the provisions of this part.

Ethanol-fueled vehicle means any motor vehicle or motor vehicle engine that is engineered and designed to be operated using ethanol fuel (*i.e.*, a fuel that contains at least 50 percent ethanol (C₂H₅OH) by volume) as fuel.

Evaporative emissions means hydrocarbons emitted into the atmosphere from a motor vehicle, other than exhaust and crankcase emissions.

Evaporative/refueling control system means a unique combination within an evaporative/refueling family of canister adsorptive material, purge system configuration, purge strategy, and other parameters determined by the Administrator to affect evaporative and refueling emission control system durability or deterioration factors.

Evaporative/refueling emission code means a unique combination, in an evaporative/refueling family-evaporative emission control system combination, of purge system calibrations, fuel tank and carburetor bowl vent calibrations and other fuel system and evaporative emission control system components and calibrations specified by the Administrator.

Evaporative/refueling family means the basic classification unit of a manufacturers' product line used for the purpose of evaporative and refueling emissions test fleet selection and determined in accordance with § 86.1821-01.

Evaporative/refueling vehicle configuration means a unique combination of basic engine, engine code, body type, and evaporative emission code.

Exhaust emissions means substances emitted to the atmosphere from any opening downstream from the exhaust port of a motor vehicle engine.

Exhaust gas recirculation valve means a device which directs a portion of the exhaust gas into the intake air stream for the purpose of controlling emissions.

Family emission limit (FEL) means a bin standard or emission level selected

by the manufacturer that serves as the applicable emission standard for the vehicles in the family or test group in the context of fleet-average standards or emission credits.

Federal Test Procedure, or FTP means the test procedure as described in § 86.130-00(a) through (d) and (f) which is designed to measure urban driving tail pipe exhaust emissions and evaporative emissions over the Urban Dynamometer Driving Schedule as described in appendix I to this part.

Fire truck means a vehicle designed to be used under emergency conditions to transport personnel and equipment and to support the suppression of fires and mitigation of other hazardous situations.

Fixed liquid level gauge means a type of liquid level gauge used on liquefied petroleum gas-fueled vehicles which uses a relatively small positive shutoff valve and is designed to indicate when the liquid level in the fuel tank being filled reaches the proper fill level. The venting of fuel vapor and/or liquid fuel to the atmosphere during the refueling event is generally associated with the use of the fixed liquid level gauge.

Fleet average cold temperature NMHC standard means, for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles, an NMHC cold temperature standard imposed over an individual manufacturer's total 50-State U.S. sales (or a fraction of total U.S. sales during phase-in years), as "U.S. sales" is defined to include all national sales, including points-of-first sale in California, of a given model year. Manufacturers determine their compliance with such a standard by averaging, on a sales-weighted basis, the individual NMHC "Family Emission Limits" (FEL—as defined in this subpart) to which light-duty vehicles, light-duty trucks and medium-duty passenger vehicles were certified and sold for that model year.

Fleet average NO_x standard means, for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles, a NO_x standard imposed over an individual manufacturer's total U.S. sales (or a fraction of total U.S. sales during phase-in years), as "U.S. sales" is defined in this subpart, of a given model year. Manufacturers determine their

compliance with such a standard by averaging, on a sales weighted basis, the individual NO_x standards they choose for the fleet of light-duty vehicles, light-duty trucks and medium-duty passenger vehicles they sell of that model year.

Flexible fuel vehicle means any motor vehicle engineered and designed to be operated on a petroleum fuel and on a methanol or ethanol fuel, or any mixture of the petroleum fuel and methanol or ethanol. Methanol-fueled and ethanol-fueled vehicles that are only marginally functional when using gasoline (*e.g.*, the engine has a drop in rated horsepower of more than 80 percent) are not flexible fuel vehicles.

Footprint is the product of average track width (rounded to the nearest tenth of an inch) and wheelbase (measured in inches and rounded to the nearest tenth of an inch), divided by 144 and then rounded to the nearest tenth of a square foot, where the average track width is the average of the front and rear track widths, where each is measured in inches and rounded to the nearest tenth of an inch.

Fuel cell vehicle means an electric vehicle propelled solely by an electric motor where energy for the motor is supplied by an electrochemical cell that produces electricity via the non-combustion reaction of a consumable fuel, typically hydrogen.

Fuel system means the combination of fuel tank(s), fuel pump, fuel lines, and carburetor or fuel injection components, and includes all fuel system vents and fuel evaporative emission control system components.

Full size pickup truck means a light truck which has a passenger compartment and an open cargo box and which meets the following specifications:

(1) A minimum cargo bed width between the wheelhouses of 48 inches, measured as the minimum lateral distance between the limiting interferences (pass-through) of the wheelhouses. The measurement shall exclude the transitional arc, local protrusions, and depressions or pockets, if present. An open cargo box means a vehicle where the cargo box does not have a permanent roof or cover. Vehicles produced with detachable covers

are considered “open” for the purposes of these criteria.

(2) A minimum open cargo box length of 60 inches, where the length is defined by the lesser of the pickup bed length at the top of the body or the pickup bed length at the floor, where the length at the top of the body is defined as the longitudinal distance from the inside front of the pickup bed to the inside of the closed endgate as measured at the height of the top of the open pickup bed along vehicle centerline, and the length at the floor is defined as the longitudinal distance from the inside front of the pickup bed to the inside of the closed endgate as measured at the cargo floor surface along vehicle centerline.

(3)(i) A minimum towing capability of 5,000 pounds, where minimum towing capability is determined by subtracting the gross vehicle weight rating from the gross combined weight rating; or

(ii) A minimum payload capability of 1,700 pounds, where minimum payload capability is determined by subtracting the curb weight from the gross vehicle weight rating.

Gaseous fuel means natural gas or liquefied petroleum gas.

Good engineering judgment has the meaning given in 40 CFR 1068.30. *See* 40 CFR 1068.5 for the administrative process we use to evaluate good engineering judgment.

Gross combination weight rating (GCWR) means the value specified by the vehicle manufacturer as the maximum weight of a loaded vehicle and trailer, consistent with good engineering judgment.

Gross vehicle weight means the manufacturer's gross weight rating for the individual vehicle.

Gross vehicle weight rating (GVWR) means the value specified by the manufacturer as the maximum design loaded weight of a single vehicle, consistent with good engineering judgment.

Hang-up refers to the process of hydrocarbon molecules being adsorbed, condensed, or by any other method removed from the sample flow prior to reaching the instrument detector. It also refers to any subsequent desorption of the molecules into the sample flow when they are assumed to be absent.

Heating degree day means the number of degrees per day the daily average temperature is below 65 degrees Fahrenheit. The daily average temperature is the mean of the maximum and minimum temperature for a 24-hour period. The annual heating degree day value is derived by summing the daily heating degree days over a calendar year period.

Heavy light-duty truck means any light-duty truck rated greater than 6000 lbs GVWR. The LDT3 and LDT4 classifications comprise the heavy light-duty truck category.

Heavy-duty engine means any engine which the engine manufacturer could reasonably expect to be used for motive power in a heavy-duty vehicle.

Heavy-duty vehicle means any motor vehicle rated at more than 8,500 pounds GVWR or that has a vehicle curb weight of more than 6,000 pounds or that has a basic vehicle frontal area in excess of 45 square feet. Note that MDPVs are heavy-duty vehicles that are in many cases subject to requirements that apply for light-duty trucks.

High altitude means any elevation over 1,219 meters (4,000 feet).

High-altitude conditions means a test altitude of 1,620 meters (5,315 feet), plus or minus 100 meters (328 feet), or equivalent observed barometric test conditions of 83.3 kPa (24.2 inches Hg) plus or minus 1 kPa (0.30 Hg).

Highway Fuel Economy Test Procedure (HFET) has the meaning given in § 600.002-08 of this chapter.

Hot-soak emissions and *Hot-soak losses* means evaporative emissions after termination of engine operation.

Hybrid electric vehicle (HEV) means a motor vehicle which draws propulsion energy from onboard sources of stored energy that are both an internal combustion engine or heat engine using consumable fuel, and a rechargeable energy storage system such as a battery, capacitor, hydraulic accumulator, or flywheel. This includes plug-in hybrid electric vehicles.

Indirect information means any information that is not specifically contained in the service literature, but is contained in items such as tools or equipment provided to franchised dealers (or others).

Inertia weight class means the class, which is a group of equivalent test weights, into which a vehicle is grouped based on its test weight basis in accordance with the provisions of this part 86.

Integrated refueling emission control system means a system where vapors resulting from refueling are stored in a common vapor storage unit(s) with other evaporative emissions of the vehicle and are purged through a common purge system.

Interim non-Tier 2 vehicle, interim non-Tier 2 LDV/LLDT, interim non-Tier 2 HLDLT/MDPV, or interim vehicle refer to 2004 or later model year light-duty vehicles, light-duty trucks or MDPVs, or a specific combination thereof, not certified to Tier 2 FTP exhaust emission standards during the Tier 2 phase-in period. Model year 2004 HLDLTs belonging to test groups whose model year commences before December 21, 2003, are not interim non-Tier 2 HLDLTs unless their manufacturer chooses to comply with the interim requirements applicable to HLDLTs for all of its 2004 model year HLDLTs as permitted in this subpart. Similarly 2004 model year heavy-duty vehicles whose model year commences before December 21, 2003, are not interim non-Tier 2 MDPVs unless their manufacturer chooses to comply with the interim requirements applicable to MDPVs for all of its 2004 model year MDPVs as permitted in this subpart. The terms *interim non-Tier 2 vehicle, interim non-Tier 2 LDV, interim non-Tier 2 LDT, interim non-Tier 2 HLDLT, interim non-Tier 2 MDPV*, etc. have the same meaning without the words "non-Tier 2".

Interior volume index has the meaning given in § 600.315-08 of this chapter.

Intermediary means any individual or entity, other than a manufacturer, which provides service or equipment to automotive technicians.

Intermediate temperature cold testing means testing done pursuant to the driving cycle and testing conditions contained in subpart C of this part, at temperatures between 25 deg. F (–4 deg. C) and 68 deg. F (20 deg. C).

In-use vehicle means a customer owned and operated vehicle which is not under the control of the manufacturer, dealerships or their agents.

Leased vehicles will be considered in-use vehicles for the purpose of this subpart if the vehicles meet the criteria specified in § 86.1845-01.

In-use verification program (IUVP) means the testing program conducted by manufacturers which gathers in-use emission data in accordance with § 86.1848-01.

LDV/T means light-duty vehicles and light-duty trucks collectively, without regard to category.

LEV III means relating to the LEV III emission standards in Title 13, §§ 1961.2 and 1976 of the California Code of Regulations, as adopted by the California Air Resources Board (incorporated by reference in § 86.1).

Light light-duty truck means any light-duty truck rated up through 6000 lbs GVWR. The LDT1 and LDT2 classifications compose the light light-duty truck category.

Light-duty truck means any motor vehicle rated at 8,500 pounds GVWR or less which has a curb weight of 6,000 pounds or less and which has a basic vehicle frontal area of 45 square feet or less, which is:

- (1) Designed primarily for purposes of transportation of property or is a derivation of such a vehicle; or
- (2) Designed primarily for transportation of persons and has a capacity of more than 12 persons; or
- (3) Available with special features enabling off-street or off-highway operation and use.

Light-duty truck 1 (LDT1) means any light light-duty truck up through 3750 lbs loaded vehicle weight.

Light-duty truck 2 (LDT2) means any light light-duty truck greater than 3750 lbs loaded vehicle weight.

Light-duty truck 3 (LDT3) means any heavy light-duty truck up through 5750 lbs adjusted loaded vehicle weight.

Light-duty truck 4 (LDT4) means any heavy light-duty truck greater than 5750 lbs adjusted loaded vehicle weight.

Light-duty vehicle means a passenger car or passenger car derivative capable of seating 12 passengers or less.

Liquefied petroleum gas means a liquid hydrocarbon fuel that is stored under pressure and is composed primarily of species that are gases at atmospheric conditions (temperature = 25 deg. C and

pressure = 1 atm), excluding natural gas.

Loaded vehicle weight means the vehicle's curb weight plus 300 pounds.

Low altitude means any elevation equal to or less than 1,219 meters (4,000 feet).

Low-altitude conditions means a test altitude less than 549 meters (1,800 feet).

Malfunction means not operating according to specifications (e.g., those specifications listed in the certification application).

Medium-duty passenger vehicle (MDPV) means any heavy-duty vehicle (as defined in this subpart) with a gross vehicle weight rating (GVWR) of less than 10,000 pounds that is designed primarily for the transportation of persons. The MDPV definition does not include any vehicle which:

- (1) Is an "incomplete truck" as defined in this subpart; or
- (2) Has a seating capacity of more than 12 persons; or
- (3) Is designed for more than 9 persons in seating rearward of the driver's seat; or
- (4) Is equipped with an open cargo area (for example, a pick-up truck box or bed) of 72.0 inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area for purposes of this definition.

Methanol-fueled vehicle means any motor vehicle or motor vehicle engine that is engineered and designed to be operated using methanol fuel (i.e., a fuel that contains at least 50 percent methanol (CH₃OH) by volume) as fuel. Model means a specific combination of car line, body style, and drivetrain configuration.

Mild hybrid electric vehicle means a hybrid electric vehicle that has start/stop capability and regenerative braking capability, where the recovered energy over the Federal Test Procedure is at least 15 percent but less than 65 percent of the total braking energy, as measured and calculated according to § 600.116-12(c).

Model type has the meaning given in § 600.002-08 of this chapter.

Model year means the manufacturer's annual production period (as determined by the Administrator) which in-

cludes January 1 of such calendar year: Provided that if the manufacturer has no annual production period, the term "model year" shall mean the calendar year.

Motor vehicle has the meaning given in § 85.1703 of this chapter.

Multi-fuel means capable of operating on two or more different fuel types, either separately or simultaneously.

Multi-fuel vehicle means any motor vehicle capable of operating on two or more different fuel types, either separately or simultaneously.

Natural gas means a fuel whose primary constituent is methane.

Nominal fuel tank capacity means the volume of the fuel tank(s), specified by the manufacturer to the nearest tenth of a U.S. gallon, which may be filled with fuel from the fuel tank filler inlet.

Non-emission-related maintenance means that maintenance which does not substantially affect emissions and which does not have a lasting effect on the emissions deterioration of the vehicle or engine during normal in-use operation once the maintenance is performed.

Non-integrated refueling emission control system means a system where fuel vapors from refueling are stored in a vapor storage unit assigned solely to the function of storing refueling vapors.

Non-Methane Hydrocarbon Equivalent means the sum of the carbon mass emissions of non-oxygenated non-methane hydrocarbons, methanol, formaldehyde, or other organic compounds that are separately measured, expressed as gasoline-fueled vehicle hydrocarbons. In the case of exhaust emissions, the hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1. In the case of diurnal and hot soak emissions, the hydrogen-to-carbon ratios of the equivalent hydrocarbons are 2.33:1 and 2.2:1, respectively.

Non-methane organic gases (NMOG) means the sum of oxygenated and non-oxygenated hydrocarbons contained in a gas sample as measured using the procedures described in 40 CFR 1066.635.

Non-oxygenated hydrocarbon means organic emissions measured by a flame

ionization detector, excluding methanol.

N/V means the ratio of engine speed in revolutions per minute (rpm) to vehicle speed in miles per hour in the top transmission gear. At the manufacturer's option, either the 1:1 transmission gear ratio or the lowest numerical gear ratio available in the transmission will be used to determine N/V.

Option, in the context of a vehicle design feature, means any available equipment or feature not standard equipment on a model.

Original Equipment Manufacturer (OEM) means the manufacturer responsible for the design and production of a vehicle or component. This manufacturer will be fully knowledgeable of any production changes made to the design of the vehicle or component and shall be able to track the individual vehicles or component with regard to such production changes.

Otto-cycle means type of engine with operating characteristics significantly similar to the theoretical Otto combustion cycle. The use of a throttle during normal operation is indicative of an Otto-cycle engine.

Oxides of nitrogen means the sum of the nitric oxide and nitrogen dioxide contained in a gas sample as if the nitric oxide were in the form of nitrogen dioxide.

Periodically regenerating trap oxidizer system means a trap oxidizer that utilizes, during normal driving conditions, an automated regeneration mode for cleaning the trap, the operation of which can be easily detected.

Petroleum equivalency factor means the value specified in 10 CFR 474.3(b), which incorporates the parameters listed in 49 U.S.C. 32904(a)(2)(B) and is used to calculate petroleum-equivalent fuel economy.

Petroleum-equivalent fuel economy means the value, expressed in miles per gallon, that is calculated for an electric vehicle in accordance with 10 CFR 474.3(a), and reported to the Administrator of the Environmental Protection Agency for use in determining the vehicle manufacturer's corporate average fuel economy.

Petroleum fuel means liquid fuels normally derived from crude oil, excluding

liquefied petroleum gas. Gasoline and diesel fuel are petroleum fuels.

Petroleum-powered accessory means a vehicle accessory (e.g., a cabin heater, defroster, and/or air conditioner) that:

(1) Uses gasoline or diesel fuel as its primary energy source; and

(2) Meets the requirements for fuel, operation, and emissions in § 86.104-94(g) of this chapter.

Platform means a segment of an automobile manufacturer's vehicle fleet in which the vehicles have a degree of commonality in construction (primarily in terms of body and chassis design). Platform does not consider the model name, brand, marketing division, or level of decor or opulence, and is not generally distinguished by such characteristics as powertrain, roof line, number of doors, seats, or windows. A platform may include vehicles from various fuel economy classes, and may include light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles.

Plug-in hybrid electric vehicle (PHEV) means a hybrid electric vehicle that has the capability to charge the battery from an off-vehicle electric source, such that the off-vehicle source cannot be connected to the vehicle while the vehicle is in motion.

Point of first sale means the location where the completed vehicle is first purchased. This term is synonymous with final product purchase location. The point of first sale may be a retail customer, dealer, distributor, fleet operator, broker, secondary manufacturer, or any other entity which purchases a vehicle from a manufacturer. In cases where the end user purchases the completed vehicle directly from the manufacturer, the end user is the point of first sale.

Precision means the standard deviation of replicated measurements.

Production volume has the meaning given in § 600.002-08 of this chapter.

Proven emission control systems are emission control components or systems (and fuel metering systems) that have completed full durability testing evaluation over a vehicle's useful life in some other certified test group, or have completed bench or road testing

demonstrated to be equal or more severe than certification mileage accumulation requirements. Alternatively, proven components or systems are those that are determined by EPA to be of comparable functional quality and manufactured using comparable materials and production techniques as components or systems which have been durability demonstrated in some other certified test group. In addition, the components or systems must be employed in an operating environment (e.g., temperature, exhaust flow, etc.) similar to that experienced by the original or comparable components or systems in the original certified test group.

Rated power means an engine's maximum power output in an installed configuration, as determined by using SAE J1349 (incorporated by reference in § 86.1).

Recall program means the program administered by the Agency under the authority of CAA section 207, and regulations in 40 CFR part 85.

Reconfigured emission-data vehicle means an emission-data vehicle obtained by modifying a previously used emission-data vehicle to represent another emission-data vehicle.

Refueling emissions means evaporative emissions that emanate from a motor vehicle fuel tank(s) during a refueling operation.

Refueling emissions canister(s) means any vapor storage unit(s) that is exposed to the vapors generated during refueling.

Resting losses means evaporative emissions that may occur continuously, that are not diurnal emissions, hot soak emissions, refueling emissions, running losses, or spitback emissions.

Round (rounded, rounding) has the meaning given in 40 CFR 1065.1001, unless otherwise specified.

Running change means a change to a vehicle or addition of a model which occurs after certification but during vehicle production.

Running losses means evaporative emissions that occur during vehicle operation.

SC03 means the test cycle, described in § 86.160-00 and listed in appendix I, paragraph (h), of this part, which is de-

signed to represent driving immediately following startup.

Scheduled maintenance means any adjustment, repair, removal, disassembly, cleaning, or replacement of vehicle components or systems which is performed on a periodic basis to prevent part failure or vehicle (if the engine were installed in a vehicle) malfunction, or anticipated as necessary from inspection to correct an overt indication of vehicle malfunction or failure for which periodic maintenance is not appropriate.

Secondary air injection means a system whereby air (not ingested by the engine) is introduced into the exhaust system in front of a catalyst.

Section 177 states means the states that have adopted California's motor vehicle standards for a particular model year under section 177 of the Clean Air Act (42 U.S.C. 7507).

Similar emission control systems are engine, fuel metering and emission control system combinations which use the same fuel (e.g., gasoline, diesel, etc.), combustion cycle (e.g., two or four stroke), general type of fuel system (e.g., carburetor or fuel injection), catalyst system (e.g., none, oxidization, three-way plus oxidization, three-way only, etc.), fuel control system (e.g., feedback or non-feedback), secondary air system (e.g., equipped or not equipped) and exhaust gas recirculation (EGR) (e.g., equipped or not equipped).

Span gas means a gas of known concentration which is used routinely to set the output level of an analyzer.

Special features enabling off-street or off-highway operation and use means a vehicle that has:

- (1) Four-wheel drive; and
- (2) At least four of the following characteristics calculated when the automobile is at curb weight, on a level surface, with the front wheels parallel to the vehicle's longitudinal centerline, and the tires inflated to the manufacturer's recommended pressure; approach angle of not less than 28 degrees, breakover angle of not less than 14 degrees, departure angle of not less than 20 degrees, running clearance of not less than 8 inches, and front and rear axle clearances of not less than 7 inches each.

Spitback emissions means evaporative emissions resulting from the loss of liquid fuel that is emitted from a vehicle during a fueling operation.

Standard equipment means those features or equipment which are marketed on a vehicle over which the purchaser can exercise no choice.

Static loaded radius arc means a portion of a circle whose center is the center of a standard tire-rim combination of an automobile and whose radius is the distance from that center to the level surface on which the automobile is standing, measured with the automobile at curb weight, the wheel parallel to the vehicle's longitudinal centerline, and the tire inflated to the manufacturer's recommended pressure.

Strong hybrid electric vehicle means a hybrid electric vehicle that has start/stop capability and regenerative braking capability, where the recovered energy over the Federal Test Procedure is at least 65 percent of the total braking energy, as measured and calculated according to § 600.116-12(c).

Subconfiguration has the meaning given in § 600.002-08 of this chapter.

Supplemental FTP (SFTP) means the additional test procedures designed to measure emissions during aggressive and microtransient driving, as described in § 86.159-00 over the US06 cycle, and also the test procedure designed to measure urban driving emissions while the vehicle's air conditioning system is operating, as described in § 86.160-00 over the SC03 cycle.

Tank fuel volume means the volume of fuel in the fuel tank(s), which is determined by taking the manufacturer's nominal fuel tank(s) capacity and multiplying by 0.40. The result is rounded to the nearest tenth of a U.S. gallon in accordance with the Rounding-Off Method specified in ASTM E29-93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications (incorporated by reference; see § 86.1)

Test group means the basic classification unit within a durability group used for the purpose of demonstrating compliance with exhaust emission standards in accordance with § 86.1841-01. The test group is also used as a classification unit for gathering in-use

data for the In-Use Verification Program (IUVP) in accordance with § 86.1848-01.

Test weight basis means the basis on which equivalent test weight is determined in accordance with § 86.129-00 of subpart B of this part.

Throttle means a device used to control an engine's power output by limiting the amount of air entering the combustion chamber.

Tier 2 HLD/MDPV means any heavy light-duty truck or medium-duty passenger vehicle, including HEVs and ZEVs, of the 2008 or later model year certified to comply with the Tier 2 FTP exhaust standards contained in § 86.1811-04 including the 0.07 g/mi fleet average NO_x standard. The term Tier 2 HLD/MDPV also includes any heavy light-duty truck or medium-duty passenger vehicle, of any model year, which is certified to Tier 2 FTP exhaust standards for purposes of generating or banking early NO_x credits for averaging under Tier 2 requirements, or utilizing alternate phase-in schedules, as allowed in this subpart.

Tier 2 LDV/LLDT means any light-duty vehicle or light light-duty truck, including HEVs and ZEVs, of the 2004 or later model year certified to comply with the Tier 2 FTP exhaust standards contained in § 86.1811-04 including the 0.07 g/mi fleet average NO_x standard. The term Tier 2 LDV/LLDT also includes any light-duty vehicle or light light-duty truck, of any model year, which is certified to Tier 2 FTP exhaust standards for purposes of generating or banking early NO_x credits for averaging under Tier 2 requirements, or utilizing alternate phase-in schedules as allowed in this subpart.

Tier 2 standards means those FTP exhaust emission standards including the 0.07 g/mi full useful life fleet average NO_x standard, applicable to new light-duty vehicles and light light-duty trucks that begin a phase-in in the 2004 model year, and those exhaust emission standards including the 0.07 g/mi full useful life fleet average NO_x standard, applicable to heavy light-duty trucks and medium-duty passenger vehicles that begin a phase-in in the 2008 model year. These standards are found in § 86.1811-04 of this subpart.

Tier 2 vehicle means any vehicle certified to comply with the Tier 2 FTP exhaust standards contained in § 86.1811-04 including the 0.07 g/mi fleet average NO_x standard.

Tier 3 means relating to the Tier 3 emission standards described in §§ 86.1811-17, 86.1813-17, and 86.1816-18.

Total hydrocarbon equivalent means the sum of the carbon mass emissions of non-oxygenated hydrocarbons, methanol, formaldehyde or other organic compounds that are separately measured, expressed as gasoline-fueled vehicle hydrocarbons. In the case of exhaust emissions, the hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1. In the case of diurnal and hot soak emissions, the hydrogen-to-carbon ratios of the equivalent hydrocarbons are 2.33:1 and 2.2:1, respectively.

Track width is the lateral distance between the centerlines of the base tires at ground, including the camber angle.

Trading means the exchange of complete heavy-duty vehicle NO_x emission credits between manufacturers.

Transmission class has the meaning given in § 600.002-08 of this chapter.

Transmission configuration has the meaning given in § 600.002-08 of this chapter.

United States has the meaning given in 40 CFR 1068.30.

U.S. heavy-duty vehicle sales means sales of heavy-duty vehicles subject to the standards of this subpart, where the sale takes place in any state of the United States except for California (or a state that has adopted California motor vehicle standards for that model year pursuant to section 177 of the Clean Air Act).

U.S. sales means, unless otherwise specified, sales in any state or territory of the United States except for California or the section 177 states. Sale location is based on the point of first sale to a dealer, distributor, fleet operator, broker, or other entity.

Unproven emission control systems are emission control components or systems (and fuel metering systems) that do not qualify as proven emission control systems.

Unscheduled maintenance means any adjustment, repair, removal disassembly, cleaning, or replacement of

vehicle components or systems which is performed to correct a part failure or vehicle (if the engine were installed in a vehicle) malfunction which was not anticipated.

US06 means the test cycle, described in § 86.159-00 and listed in appendix I, paragraph (g), of this part, which is designed to evaluate emissions during aggressive and microtransient driving.

Useful life means the period of use or time during which an emission standard applies to light-duty vehicles and light-duty trucks, as described in § 86.1805-01.

Van means a light-duty truck or complete heavy-duty vehicle having an integral enclosure, fully enclosing the driver compartment and load carrying device, and having no body sections protruding more than 30 inches ahead of the leading edge of the windshield.

Vehicle configuration means a unique combination of basic engine, engine code, inertia weight class, transmission configuration, and axle ratio.

Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

Wheelbase is the longitudinal distance between front and rear wheel centerlines.

Zero (0) miles means that point after initial engine starting (not to exceed 100 miles of vehicle operation, or three hours of engine operation) at which normal assembly line operations and adjustments are completed, and including emission testing, if performed.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6851, Feb. 10, 2000; 65 FR 59964, Oct. 6, 2000; 66 FR 5189, Jan. 18, 2001; 71 FR 2829, Jan. 17, 2006; 72 FR 8561, Feb. 26, 2007; 75 FR 25683, May 7, 2010; 77 FR 34146, June 8, 2012; 77 FR 63155, Oct. 15, 2012; 79 FR 23707, Apr. 28, 2014]

§ 86.1804-01 Acronyms and abbreviations.

The following abbreviations apply to this subpart:

A/C—Air conditioning.
 AECD—Auxiliary emission control device.
 A/F—Air/Fuel
 ALVW—Adjusted Loaded Vehicle Weight.

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API—American Petroleum Institute.
ASTM—American Society for Testing and Materials.
BAT—Bench-Aging Time
C—Celsius.
cfm—Cubic feet per minute.
CFV—Critical flow venturi.
CFV-CVS—Critical flow venturi—constant volume sampler.
CH₃OH—Methanol.
CID—Cubic inch displacement.
Cl—Chemiluminescence.
CO—Carbon monoxide.
CO₂—Carbon dioxide.
conc.—Concentration.
CST—Certification Short Test.
cu. in.—Cubic inch(es).
CVS—Constant volume sampler.
DDV—Durability Data Vehicle.
deg.—Degree(s).
DNPH—2,4-dinitrophenylhydrazine.
EDV—Emission Data Vehicle.
EP—End point.
ETW—Equivalent test weight.
F—Fahrenheit.
FEL—Family Emission Limit.
FID—Flame ionization detector.
ft.—Feet.
FTP—Federal Test Procedure.
g—gram(s).
gal.—U.S. gallon(s).
GC—Gas chromatograph.
GVW—Gross vehicle weight.
GVWR—Gross vehicle weight rating.
H₂O—Water.
HC—Hydrocarbon(s).
HCHO—Formaldehyde.
HDV—Heavy-duty vehicle.
HEV—Hybrid electric vehicle.
HFID—Heated flame ionization detector.
Hg—Mercury.
HLDT—Heavy light-duty truck. Includes only those trucks over 6000 pounds GVWR (LDT3s and LDT4s).
HLDT/MDPV—Heavy light-duty trucks and medium-duty passenger vehicles.
hp—Horsepower.
HPLC—High-pressure liquid chromatography.
IBP—Initial boiling point.
in.—Inch(es).
IUVP—In-Use Verification Program.
K—Kelvin.
kg—Kilogram(s).
km—Kilometer(s).
kPa—Kilopascal(s).
lb.—Pound(s).
LDT1—Light-duty truck 1.
LDT2—Light-duty truck 2.
LDT3—Light-duty truck 3.
LDT4—Light-duty truck 4.
LDV/LLDT—Light-duty vehicles and light-duty trucks. Includes only those trucks rated at 6000 pounds GVWR or less (LDT1s and LDT2s).
LDV/T—Light-duty vehicles and light-duty trucks. This term is used collectively to

include, or to show that a provision applies to, all light-duty vehicles and all categories of light-duty trucks, i.e.
LDT1, LDT2, LDT3 and LDT4.
LEV—Low Emission Vehicle.
LPG—Liquefied Petroleum Gas.
m—Meter(s).
max.—Maximum.
MDPV—Medium-duty passenger vehicle.
mg—Milligram(s).
mi.—Mile(s).
min.—Minimum.
ml—Milliliter(s).
mm—Millimeter(s).
mph—Miles per hour.
mV—Millivolt
N₂—Nitrogen.
NDIR—Nondispersive infrared.
NLEV—Refers to the National Low Emission Vehicle Program. Regulations governing this program are found at subpart R of this part.
NMHC—Nonmethane Hydrocarbons.
NMHCE—Non-Methane Hydrocarbon Equivalent.
NMOG—Non-methane organic gases.
NO—nitric oxide.
No.—Number.
O₂—Oxygen.
OEM—Original equipment manufacturer.
NO₂—Nitrogen dioxide.
NO_x—Oxides of nitrogen.
Pb—Lead.
pct.—Percent.
PDP-CVS—Positive displacement pump—constant volume sampler.
ppm—Parts per million by volume.
PM—Particulate Matter.
ppm C—Parts per million, carbon.
psi—Pounds per square inch.
R—Rankin.
RAF—Reactivity adjustment factor.
rpm—Revolutions per minute.
RVP—Reid vapor pressure.
s—Second(s).
SAE—Society of Automotive Engineers.
SBC—Standard Bench Cycle
SFTP—Supplemental Federal Test Procedure.
SI—International system of units.
SRC—Standard Road Cycle
SULEV—Super Ultra Low Emission Vehicle.
TD—dispensed fuel temperature.
THC—Total Hydrocarbons.
THCE—Total Hydrocarbon Equivalent.
TLEV—Transitional Low Emission Vehicle.
UDDS—Urban dynamometer driving schedule.
ULEV—Ultra Low Emission Vehicle.
UV—Ultraviolet.
vs—Versus.
W—Watt(s).
WOT—Wide open throttle.
Wt.—Weight.

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ZEV—Zero Emission Vehicle.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6852, Feb. 10, 2000; 65 FR 59965, Oct. 6, 2000; 71 FR 2829, Jan. 17, 2006]

§ 86.1805-04 Useful life.

(a) Except as required under paragraph (b) of this section or permitted under paragraphs (d), (e) and (f) of this section, the full useful life for all LDVs, LDT1s and LDT2s is a period of use of 10 years or 120,000 miles, whichever occurs first. For all HLDTs, MDPVs, and complete heavy-duty vehicles full useful life is a period of 11 years or 120,000 miles, whichever occurs first. This full useful life applies to all exhaust, evaporative and refueling emission requirements except for standards which are specified to only be applicable at the time of certification.

(b) Manufacturers may elect to optionally certify a test group to the Tier 2 exhaust emission standards for 150,000 miles to gain additional NO_x credits, as permitted in § 86.1860-04(g), or to opt out of intermediate life standards as permitted in § 86.1811-04(c). In such cases, useful life is a period of use of 15 years or 150,000 miles, whichever occurs first, for all exhaust, evaporative and refueling emission requirements except for cold CO standards and standards which are applicable only at the time of certification.

(c) Where intermediate useful life exhaust emission standards are applicable, such standards are applicable for five years or 50,000 miles, whichever occurs first.

(d) Where cold CO standards are applicable, the useful life requirement for compliance with the cold CO standard only, is 5 years or 50,000 miles, whichever occurs first.

(e) Where LDVs, LDT1s and LDT2s of the 2003 or earlier model years are certified to Tier 2 exhaust emission standards for purposes of generating early Tier 2 NO_x credits, manufacturers may certify those vehicles to full useful lives of 100,000 miles in lieu of the otherwise required 120,000 mile full useful lives, as provided under § 86.1861-04(c)(4).

(f) For interim non-Tier 2 LDV/LLDTs, the useful life requirement for exhaust, evaporative and refueling

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emissions is 10 years or 100,000 miles, whichever occurs first.

(g) Where cold temperature NMHC standards are applicable, the useful life requirement for compliance with the cold temperature NMHC standard only is as follows:

(1) For LDV/LLDTs, 10 years or 120,000 miles, whichever occurs first.

(2) For HLDT/MDPVs, 11 years or 120,000 miles, whichever occurs first.

[65 FR 6852, Feb. 10, 2000, as amended at 65 FR 59965, Oct. 6, 2000; 72 FR 8561, Feb. 26, 2007]

§ 86.1805-12 Useful life.

(a) Except as permitted under paragraph (b) of this section or required under paragraphs (c) and (d) of this section, the full useful life for all LDVs and LLDTs is a period of use of 10 years or 120,000 miles, whichever occurs first. The full useful life for all HLDTs, MDPVs, and complete heavy-duty vehicles is a period of 11 years or 120,000 miles, whichever occurs first. These full useful life values apply to all exhaust, evaporative and refueling emission requirements except for standards which are specified to only be applicable at the time of certification. These full useful life requirements also apply to all air conditioning leakage credits, air conditioning efficiency credits, and other credit programs used by the manufacturer to comply with the fleet average CO₂ emission standards in § 86.1818-12.

(b) Manufacturers may elect to optionally certify a test group to the Tier 2 exhaust emission standards for 150,000 miles to gain additional NO_x credits, as permitted in § 86.1860-04(g), or to opt out of intermediate life standards as permitted in § 86.1811-04(c). In such cases, useful life is a period of use of 15 years or 150,000 miles, whichever occurs first, for all exhaust, evaporative and refueling emission requirements except for cold CO standards and standards which are applicable only at the time of certification.

(c) Where intermediate useful life exhaust emission standards are applicable, such standards are applicable for five years or 50,000 miles, whichever occurs first.

(d) Where cold CO standards are applicable, the useful life requirement for

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compliance with the cold CO standard only, is 5 years or 50,000 miles, whichever occurs first.

[75 FR 25685, May 7, 2010]

§ 86.1805–17 Useful life.

(a) *General provisions.* The useful life values specified in this section apply for all exhaust, evaporative, refueling, and OBD emission requirements described in this subpart, except for standards that are specified to apply only at certification. These useful life requirements also apply to all air conditioning leakage credits, air conditioning efficiency credits, and other credit programs used by the manufacturer to comply with the fleet-average CO₂ emission standards in § 86.1818. Useful life values are specified as a given number of calendar years and miles of driving, whichever comes first.

(b) *Greenhouse gas pollutants.* The emission standards in § 86.1818 apply for a useful life of 10 years or 120,000 miles for LDV and LLDT and 11 years or 120,000 miles for HLDT and HDV. Manufacturers may alternatively certify based on a longer useful life as specified in paragraph (d) of this section.

(c) *Cold temperature emission standards.* The cold temperature NMHC emission standards in § 86.1811 apply for a useful life of 10 years or 120,000 miles for vehicles at or below 6,000 pounds GVWR, and 11 years or 120,000 miles for vehicles above 6,000 pounds GVWR. The cold temperature CO emission standards in § 86.1811 apply for a useful life of 5 years or 50,000 miles.

(d) *Criteria pollutants.* The useful life provisions of this paragraph (d) apply for all emission standards not covered by paragraph (b) or (c) of this section. Except as specified in paragraph (f) of this section and in §§ 86.1811, 86.1813, and 86.1816, the useful life for LDT2, HLDT, MDPV, and HDV is 15 years or 150,000 miles. The useful life for LDV and LDT1 is 10 years or 120,000 miles. Manufacturers may optionally certify LDV and LDT1 to a useful life of 15 years or 150,000 miles, in which case the longer useful life would apply for all the standards and requirements covered by this paragraph (d).

(e) *Intermediate useful life.* Where exhaust emission standards are specified for an intermediate useful life, these

standards apply for five years or 50,000 miles.

(f) *Interim provisions.* The useful life provisions of § 86.1805–12 apply for vehicles not yet subject to Tier 3 requirements. For example, vehicles above 6,000 pounds GVWR are not subject to the useful life provisions in this section until model year 2019 unless manufacturers voluntarily certify to the Tier 3 requirements earlier than the regulations require. Also, where the transition to Tier 3 standards involves a phase-in percentage for a given standard, vehicles not included as part of the phase-in portion of the fleet continue to be subject to the useful life provisions of § 86.1805–12 with respect to that standard. The useful life values for a set of vehicles may be different for exhaust and evaporative emission standards in 2021 and earlier model years; if vehicles have different useful life values for evaporative and exhaust emission standards, the evaporative useful life applies for the OBD requirements related to the leak standard and the exhaust useful life applies for all other OBD requirements.

[79 FR 23708, Apr. 28, 2014]

§ 86.1806–05 Onboard diagnostics.

(a) *General.* (1) Except as provided by paragraph (a)(2) of this section, all light-duty vehicles, light-duty trucks and complete heavy-duty vehicles weighing 14,000 pounds GVWR or less (including MDPVs) must be equipped with an onboard diagnostic (OBD) system capable of monitoring all emission-related powertrain systems or components during the applicable useful life of the vehicle. All systems and components required to be monitored by these regulations must be evaluated periodically, but no less frequently than once per applicable certification test cycle as defined in paragraphs (a) and (d) of Appendix I of this part, or similar trip as approved by the Administrator. Emissions of CO₂, CH₄, and N₂O are not required to be monitored by the OBD system.

(2) Diesel fueled MDPVs and heavy-duty vehicles weighing 14,000 pounds GVWR or less that are not MDPVs must meet the OBD requirements of this section according to the phase-in

schedule in paragraph (1) of this section. Paragraph (1) of this section does not apply to Otto-cycle MDPVs.

(3) An OBD system demonstrated to fully meet the requirements in, through model year 2006, § 86.004-17 and, for model years 2007 and later, § 86.007-17 may be used to meet the requirements of this section, provided that such an OBD system also incorporates appropriate transmission diagnostics as may be required under this section, and provided that the Administrator finds that a manufacturer's decision to use the flexibility in this paragraph (a)(3) is based on good engineering judgement.

(b) *Malfunction descriptions.* The OBD system must detect and identify malfunctions in all monitored emission-related powertrain systems or components according to the following malfunction definitions as measured and calculated in accordance with test procedures set forth in subpart B of this part (chassis-based test procedures), excluding those test procedures defined as "Supplemental" test procedures in § 86.004-2 and codified in §§ 86.158, 86.159, and 86.160. For clean alternative fuel conversion manufacturers, your OBD system is expected to detect and identify malfunctions in all monitored emission-related powertrain systems or components according to the malfunction definitions described in this paragraph (b) as measured and calculated in accordance with the chassis-based test procedures set forth in subpart B of this part to the extent feasible, excluding the elements of the Supplemental FTP (see § 86.1803). However, at a minimum, systems must detect and identify malfunctions as described in paragraph (k)(7) of this section.

(1) *Catalysts and particulate traps*—(i) *Otto-cycle.* Catalyst deterioration or malfunction before it results in an increase in NMHC emissions 1.5 times the NMHC standard or FEL, as compared to the NMHC emission level measured using a representative 4000 mile catalyst system.

(ii) *Diesel.* (A) If equipped, catalyst deterioration or malfunction before it results in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NO_x or PM. This requirement applies only to reduction catalysts;

monitoring of oxidation catalysts is not required. This monitoring need not be done if the manufacturer can demonstrate that deterioration or malfunction of the system will not result in exceedance of the threshold.

(B) If equipped with a particulate trap, catastrophic failure of the device must be detected. Any particulate trap whose complete failure results in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NO_x or PM must be monitored for such catastrophic failure. This monitoring need not be done if the manufacturer can demonstrate that a catastrophic failure of the system will not result in exceedance of the threshold.

(2) *Engine misfire*—(i) *Otto-cycle.* Engine misfire resulting in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NMHC, CO or NO_x; and any misfire capable of damaging the catalytic converter.

(ii) *Diesel.* Lack of cylinder combustion must be detected.

(3) *Oxygen sensors.* If equipped, oxygen sensor deterioration or malfunction resulting in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NMHC, CO or NO_x.

(4) *Evaporative leaks.* If equipped, any vapor leak in the evaporative and/or refueling system (excluding the tubing and connections between the purge valve and the intake manifold) greater than or equal in magnitude to a leak caused by a 0.040 inch diameter orifice; an absence of evaporative purge air flow from the complete evaporative emission control system. On vehicles with fuel tank capacity greater than 25 gallons, the Administrator may, following a request from the manufacturer, revise the size of the orifice to the smallest orifice feasible, based on test data, if the most reliable monitoring method available cannot reliably detect a system leak equal to a 0.040 inch diameter orifice.

(5) *Other emission control systems.* Any deterioration or malfunction occurring in a powertrain system or component directly intended to control emissions, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, the secondary air

system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding 1.5 times the applicable emission standard or FEL for NMHC, CO, NO_x, or diesel PM. For vehicles equipped with a secondary air system, a functional check, as described in paragraph (b)(6) of this section, may satisfy the requirements of this paragraph provided the manufacturer can demonstrate that deterioration of the flow distribution system is unlikely. This demonstration is subject to Administrator approval and, if the demonstration and associated functional check are approved, the diagnostic system must indicate a malfunction when some degree of secondary airflow is not detectable in the exhaust system during the check. For vehicles equipped with positive crankcase ventilation (PCV), monitoring of the PCV system is not necessary provided the manufacturer can demonstrate to the Administrator's satisfaction that the PCV system is unlikely to fail.

(6) *Other emission-related powertrain components.* Any other deterioration or malfunction occurring in an electronic emission-related powertrain system or component not otherwise described in paragraphs (b)(1) through (b)(5) of this section that either provides input to or receives commands from the on-board computer and has a measurable impact on emissions; monitoring of components required by this paragraph (b)(6) must be satisfied by employing electrical circuit continuity checks and rationality checks for computer input components (input values within manufacturer specified ranges based on other available operating parameters), and functionality checks for computer output components (proper functional response to computer commands) except that the Administrator may waive such a rationality or functionality check where the manufacturer has demonstrated infeasibility. Malfunctions are defined as a failure of the system or component to meet the electrical circuit continuity checks or the rationality or functionality checks.

(7) *Performance of OBD functions.* Oxygen sensor or any other component deterioration or malfunction which renders that sensor or component incapable of performing its function as part of

the OBD system must be detected and identified on vehicles so equipped.

(8) *Hybrid electric vehicles.* For Tier 2 and interim non-Tier 2 hybrid electric vehicles (HEVs) only. Unless added to HEVs in compliance with other requirements of this section, or unless otherwise approved by the Administrator:

(i) The manufacturer must equip each HEV with a maintenance indicator consisting of a light that must activate automatically by illuminating the first time the minimum performance level is observed for each battery system component. Possible battery system components requiring monitoring are: battery water level, temperature control, pressure control, and other parameters critical for determining battery condition.

(ii) [Reserved]

(iii) The manufacturer must equip each HEV with a separate odometer or other device subject to the approval of the Administrator that can accurately measure the mileage accumulation on the engines used in these vehicles.

(c) *Malfunction indicator light (MIL).* The OBD system must incorporate a malfunction indicator light (MIL) readily visible to the vehicle operator. When illuminated, the MIL must display "Check Engine," "Service Engine Soon," a universally recognizable engine symbol, or a similar phrase or symbol approved by the Administrator. A vehicle should not be equipped with more than one general purpose malfunction indicator light for emission-related problems; separate specific purpose warning lights (e.g. brake system, fasten seat belt, oil pressure, etc.) are permitted. The use of red for the OBD-related malfunction indicator light is prohibited.

(d) *MIL illumination.* (1) The MIL must illuminate and remain illuminated when any of the conditions specified in paragraph (b) of this section are detected and verified, or whenever the engine control enters a default or secondary mode of operation considered abnormal for the given engine operating conditions. The MIL must blink once per second under any period of operation during which engine misfire is occurring and catalyst damage is imminent. If such misfire is detected

again during the following driving cycle (i.e., operation consisting of, at a minimum, engine start-up and engine shut-off) or the next driving cycle in which similar conditions are encountered, the MIL must maintain a steady illumination when the misfire is not occurring and then remain illuminated until the MIL extinguishing criteria of this section are satisfied. The MIL must also illuminate when the vehicle's ignition is in the "key-on" position before engine starting or cranking and extinguish after engine starting if no malfunction has previously been detected. If a fuel system or engine misfire malfunction has previously been detected, the MIL may be extinguished if the malfunction does not reoccur during three subsequent sequential trips during which similar conditions are encountered and no new malfunctions have been detected. Similar conditions are defined as engine speed within 375 rpm, engine load within 20 percent, and engine warm-up status equivalent to that under which the malfunction was first detected. If any malfunction other than a fuel system or engine misfire malfunction has been detected, the MIL may be extinguished if the malfunction does not reoccur during three subsequent sequential trips during which the monitoring system responsible for illuminating the MIL functions without detecting the malfunction, and no new malfunctions have been detected. Upon Administrator approval, statistical MIL illumination protocols may be employed, provided they result in comparable timeliness in detecting a malfunction and evaluating system performance, i.e., three to six driving cycles would be considered acceptable.

(2)(i) For interim non-Tier 2 and Tier 2 LDV/LLDTs and HLDT/MDPVs produced through the 2007 model year, upon a manufacturer's written request, EPA will consider allowing the use of an on-board diagnostic system during the certification process that functions properly on low-sulfur gasoline but indicates sulfur-induced passes when exposed to high sulfur gasoline. After the 2007 model year, this provision can be used only for interim non-Tier 2 and Tier 2 LDV/LLDTs and HLDT/MDPVs introduced into commerce in American

Samoa, Guam, and the Commonwealth of the Northern Mariana Islands, but this provision only can be used for such vehicles in any of those locations if low sulfur gasoline is determined by the Administrator to be unavailable in that specific location.

(ii) For interim non-Tier 2 and Tier 2 LDV/LLDTs and HLDT/MDPVs, if vehicles produced through the 2007 model year exhibit illuminations of the emission control diagnostic system malfunction indicator light due to high sulfur gasoline, EPA will consider, upon a manufacturer's written request, allowing modifications to such vehicles on a case-by-case basis so as to eliminate the sulfur induced illumination. After the 2007 model year, this provision can be used only for interim non-Tier 2 and Tier 2 LDV/LLDTs and HLDT/MDPVs introduced into commerce in American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands, but this provision only can be used for such vehicles in any of those locations if low sulfur gasoline is determined by the Administrator to be unavailable in that specific location.

(e) *Storing of computer codes.* The OBD system shall record and store in computer memory diagnostic trouble codes and diagnostic readiness codes indicating the status of the emission control system. These codes shall be available through the standardized data link connector per specifications as referenced in paragraph (h) of this section.

(1) A diagnostic trouble code must be stored for any detected and verified malfunction causing MIL illumination. The stored diagnostic trouble code must identify the malfunctioning system or component as uniquely as possible. At the manufacturer's discretion, a diagnostic trouble code may be stored for conditions not causing MIL illumination. Regardless, a separate code should be stored indicating the expected MIL illumination status (i.e., MIL commanded "ON," MIL commanded "OFF").

(2) For a single misfiring cylinder, the diagnostic trouble code(s) must uniquely identify the cylinder, unless the manufacturer submits data and/or

engineering evaluations which adequately demonstrate that the misfiring cylinder cannot be reliably identified under certain operating conditions. For diesel vehicles only, the specific cylinder for which combustion cannot be detected need not be identified if new hardware would be required to do so. The diagnostic trouble code must identify multiple misfiring cylinder conditions; under multiple misfire conditions, the misfiring cylinders need not be uniquely identified if a distinct multiple misfire diagnostic trouble code is stored.

(3) The diagnostic system may erase a diagnostic trouble code if the same code is not re-registered in at least 40 engine warm-up cycles, and the malfunction indicator light is not illuminated for that code.

(4) Separate status codes, or readiness codes, must be stored in computer memory to identify correctly functioning emission control systems and those emission control systems which require further vehicle operation to complete proper diagnostic evaluation. A readiness code need not be stored for those monitors that can be considered continuously operating monitors (e.g., misfire monitor, fuel system monitor, etc.). Readiness codes should never be set to "not ready" status upon key-on or key-off; intentional setting of readiness codes to "not ready" status via service procedures must apply to all such codes, rather than applying to individual codes. Subject to Administrator approval, if monitoring is disabled for a multiple number of driving cycles (i.e., more than one) due to the continued presence of extreme operating conditions (e.g., ambient temperatures below 40 °F, or altitudes above 8000 feet), readiness for the subject monitoring system may be set to "ready" status without monitoring having been completed. Administrator approval shall be based on the conditions for monitoring system disablement, and the number of driving cycles specified without completion of monitoring before readiness is indicated.

(f) *Available diagnostic data.* (1) Upon determination of the first malfunction of any component or system, "freeze frame" engine conditions present at the time must be stored in computer

memory. Should a subsequent fuel system or misfire malfunction occur, any previously stored freeze frame conditions must be replaced by the fuel system or misfire conditions (whichever occurs first). Stored engine conditions must include, but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate, and intake manifold pressure if the information needed to determine these conditions is available to the computer. For freeze frame storage, the manufacturer must include the most appropriate set of conditions to facilitate effective repairs. If the diagnostic trouble code causing the conditions to be stored is erased in accordance with paragraph (d) of this section, the stored engine conditions may also be erased.

(2) The following data in addition to the required freeze frame information must be made available on demand through the serial port on the standardized data link connector, if the information is available to the on-board computer or can be determined using information available to the on-board computer: Diagnostic trouble codes, engine coolant temperature, fuel control system status (closed loop, open loop, other), fuel trim, ignition timing advance, intake air temperature, manifold air pressure, air flow rate, engine RPM, throttle position sensor output value, secondary air status (upstream, downstream, or atmosphere), calculated load value, vehicle speed, and fuel pressure. The signals must be provided in standard units based on SAE specifications incorporated by reference in paragraph (h) of this section. Actual signals must be clearly identified separately from default value or limp home signals.

(3) For all OBD systems for which specific on-board evaluation tests are conducted (catalyst, oxygen sensor, etc.), the results of the most recent test performed by the vehicle, and the limits to which the system is compared must be available through the standardized data link connector per the appropriate standardized specifications as referenced in paragraph (h) of this section.

(4) Access to the data required to be made available under this section shall be unrestricted and shall not require any access codes or devices that are only available from the manufacturer.

(g) *Exceptions.* The OBD system is not required to evaluate systems or components during malfunction conditions if such evaluation would result in a risk to safety or failure of systems or components. Additionally, the OBD system is not required to evaluate systems or components during operation of a power take-off unit such as a dump bed, snow plow blade, or aerial bucket, etc.

(h) *Incorporation by reference.* The following additional requirements apply based on industry standard specifications, which are incorporated by reference in § 86.1:

(1) The following requirements apply for standardized on-board to off-board communications:

(i) Starting in model year 2008, light-duty vehicles and light-duty trucks must comply with ISO 15765-4:2005(E), "Road Vehicles-Diagnostics on Controller Area Network (CAN)—Part 4: Requirements for emission-related systems", January 15, 2005.

(ii) Starting in model year 2008, heavy-duty vehicles must comply with the protocol described in paragraph (h)(1)(i) of this section, or the following set of SAE standards: SAE J1939-11, Revised October 1999; SAE J1939-13, July 1999; SAE J1939-21, Revised April 2001; SAE J1939-31, Revised December 1997; SAE J1939-71, Revised January 2008; SAE J1939-73, Revised September 2006; SAE J1939-81, May 2003.

(iii) Note that for model years 1996 through 2007 manufacturers could instead comply with the protocols specified in SAE J1850, ISO 9141-2, or ISO 14230-4.

(2) Light-duty vehicles and light-duty trucks must meet the following additional specifications:

(i) Basic diagnostic data (as specified in §§ 86.094-17(e) and (f)) shall be provided in the format and units in SAE J1979 "E/E Diagnostic Test Modes—Equivalent to ISO/DIS 15031-5: Revised, May 2007.

(ii) Diagnostic trouble codes shall be consistent with SAE J2012 "Diagnostic Trouble Code Definitions—Equivalent

to ISO/DIS 15031-6: April 30, 2002", (Revised, April 2002).

(iii) The connection interface between the OBD system and test equipment and diagnostic tools shall meet the functional requirements of SAE J1962 "Diagnostic Connector—Equivalent to ISO/DIS 15031-3: December 14, 2001" (Revised, April 2002).

(iv) SAE J1930, Revised April 2002. All acronyms, definitions and abbreviations shall be formatted according to this industry standard. Alternatively, manufacturers may use SAE J2403, Revised August 2007.

(v) All equipment used to interface, extract, and display OBD-related information shall meet SAE J1978 "OBD II Scan Tool" Equivalent to ISO 15031-4: December 14, 2001", (Revised, April 2002).

(i) *Deficiencies and alternative fueled vehicles.* Upon application by the manufacturer, the Administrator may accept an OBD system as compliant even though specific requirements are not fully met. Such compliances without meeting specific requirements, or deficiencies, will be granted only if compliance would be infeasible or unreasonable considering such factors as, but not limited to: Technical feasibility of the given monitor and lead time and production cycles including phase-in or phase-out of vehicle designs and programmed upgrades of computers. Unmet requirements should not be carried over from the previous model year except where unreasonable hardware or software modifications would be necessary to correct the deficiency, and the manufacturer has demonstrated an acceptable level of effort toward compliance as determined by the Administrator. Furthermore, EPA will not accept any deficiency requests that include the complete lack of a major diagnostic monitor ("major" diagnostic monitors being those for exhaust aftertreatment devices, oxygen sensor, air-fuel ratio sensor, NO_x sensor, engine misfire, evaporative leaks, and diesel EGR, if equipped), with the possible exception of the special provisions for alternative fueled engines. For alternative fueled vehicles (e.g., natural gas, liquefied petroleum gas, methanol, ethanol), manufacturers may request the Administrator to

waive specific monitoring requirements of this section for which monitoring may not be reliable with respect to the use of the alternative fuel. At a minimum, alternative fuel engines must be equipped with an OBD system meeting OBD requirements to the extent feasible as approved by the Administrator.

(j) *California OBDII compliance option.* Manufacturers may comply with California's OBD requirements instead of meeting the requirements of this section as follows:

(1) Through the 2006 model year, demonstration of compliance with California OBDII requirements (Title 13 California Code of Regulations §1968.2 (13 CCR 1968.2)), as modified, approved and filed on April 21, 2003 (incorporated by reference, see §86.1), shall satisfy the requirements of this section, except that compliance with 13 CCR 1968.2(e)(4.2.2)(C), pertaining to 0.02 inch evaporative leak detection, and 13 CCR 1968.2(d)(1.4), pertaining to tampering protection, are not required to satisfy the requirements of this section. Also, the deficiency provisions of 13 CCR 1968.2(i) do not apply. In addition, demonstration of compliance with 13 CCR 1968.2(e)(16.2.1)(C), to the extent it applies to the verification of proper alignment between the camshaft and crankshaft, applies only to vehicles equipped with variable valve timing.

(2) For 2007 through 2012 model year vehicles, demonstration of compliance with California OBD II requirements (Title 13 California Code of Regulations §1968.2 (13 CCR 1968.2)), approved on November 9, 2007 (incorporated by reference, see §86.1), shall satisfy the requirements of this section, except that compliance with 13 CCR 1968.2(e)(4.2.2)(C), pertaining to 0.02 inch evaporative leak detection, and 13 CCR 1968.2(d)(1.4), pertaining to tampering protection, are not required to satisfy the requirements of this section. Also, the deficiency provisions of 13 CCR 1968.2(k) do not apply. In addition, demonstration of compliance with 13 CCR 1968.2(e)(15.2.1)(C), to the extent it applies to the verification of proper alignment between the camshaft and crankshaft, applies only to vehicles equipped with variable valve timing.

(3) Beginning with the 2013 model year, manufacturers may demonstrate compliance with California's 2013 OBD requirements as described in §86.1806-17(a).

(4) For all model years, the deficiency provisions of paragraph (i) of this section and the evaporative leak detection requirement of paragraph (b)(4) of this section, if applicable, apply to manufacturers selecting this paragraph for demonstrating compliance.

(k) *Certification.* For test groups required to have an OBD system, certification will not be granted if, for any test vehicle approved by the Administrator in consultation with the manufacturer, the malfunction indicator light does not illuminate under any of the following circumstances, unless the manufacturer can demonstrate that any identified OBD problems discovered during the Administrator's evaluation will be corrected on production vehicles.

(1)(i) *Otto-cycle.* A catalyst is replaced with a deteriorated or defective catalyst, or an electronic simulation of such, resulting in an increase of 1.5 times the NMHC standard or FEL above the NMHC emission level measured using a representative 4000 mile catalyst system.

(ii) *Diesel.* (A) If monitored for emissions performance—a catalyst is replaced with a deteriorated or defective catalyst, or an electronic simulation of such, resulting in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NO_x or PM.

(B) If monitored for performance—a particulate trap is replaced with a trap that has catastrophically failed, or an electronic simulation of such.

(2)(i) *Otto-cycle.* An engine misfire condition is induced resulting in exhaust emissions exceeding 1.5 times the applicable standards or FEL for NMHC, CO or NO_x.

(ii) *Diesel.* An engine misfire condition is induced and is not detected.

(3) If so equipped, any oxygen sensor is replaced with a deteriorated or defective oxygen sensor, or an electronic simulation of such, resulting in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NMHC, CO or NO_x.

(4) If so equipped, a vapor leak is introduced in the evaporative and/or refueling system (excluding the tubing and connections between the purge valve and the intake manifold) greater than or equal in magnitude to a leak caused by a 0.040 inch diameter orifice, or the evaporative purge air flow is blocked or otherwise eliminated from the complete evaporative emission control system.

(5) A malfunction condition is induced in any emission-related powertrain system or component, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, the secondary air system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding 1.5 times the applicable emission standard or FEL for NMHC, CO, NO_x or PM.

(6) A malfunction condition is induced in an electronic emission-related powertrain system or component not otherwise described in this paragraph (k) that either provides input to or receives commands from the on-board computer resulting in a measurable impact on emissions.

(7) For clean alternative fuel conversion manufacturers (e.g., natural gas, liquefied petroleum gas, methanol, ethanol), in lieu of the requirements specified for other manufacturers in this paragraph (k), you may demonstrate that the malfunction indicator light will illuminate, at a minimum, under any of the following circumstances when the vehicle is operated on the applicable alternative fuel:

(i) *Otto-cycle*. A catalyst is replaced with a defective catalyst system where the catalyst brick for the monitored volume has been removed (i.e., empty catalyst system) resulting in an increase of 1.5 times the NMOG (or NMOG+NO_x) standard or FEL above the NMOG (or NMOG+NO_x) emission level measured using a representative 4000 mile catalyst system.

(ii) *Diesel*. (A) If monitored for emissions performance—a catalyst is replaced with a defective catalyst system where the catalyst brick for the monitored volume has been removed (i.e., empty catalyst can) resulting in exhaust emissions exceeding 1.5 times the

applicable standard or FEL for NO_x (or NMOG+NO_x) or PM.

(B) If monitored for performance—a particulate trap is replaced with a trap that has catastrophically failed.

(iii) *Misfire*. (A) *Otto-cycle*. An engine misfire condition is induced that completely disables one or more cylinders, either through mechanical or electrical means, resulting in exhaust emissions exceeding 1.5 times the applicable standards or FEL for CO, NMOG, or NO_x (or NMOG+NO_x).

(B) *Diesel*. An engine misfire condition resulting in complete lack of cylinder firing is induced and is not detected.

(iv) If so equipped, any oxygen sensor is replaced with a completely defective oxygen sensor, or an electronic simulation of such, resulting in exhaust emissions exceeding 1.5 times the applicable standard or FEL for CO, NMOG, or NO_x (or NMOG+NO_x).

(v) If so equipped and applicable, a vapor leak is introduced in the evaporative and/or refueling system (excluding the tubing and connections between the purge valve and the intake manifold) greater than or equal in magnitude to a leak caused by a 0.040 inch diameter orifice, or the evaporative purge air flow is blocked or otherwise eliminated from the complete evaporative emission control system. At a minimum, gas cap removal or complete venting of the evaporative and/or refueling system may be introduced resulting in a gross leak of the complete evaporative emission control system.

(vi) A malfunction condition is induced resulting in complete disablement in any emission-related powertrain system or component, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, the secondary air system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding 1.5 times the applicable emission standard or FEL for PM, CO, NMOG, or NO_x (or NMOG+NO_x).

(vii) A malfunction condition is induced that completely disables an electronic emission-related powertrain system or component not otherwise described in this paragraph (k) that either provides input to or receives commands from the onboard computer resulting in a measurable impact on emissions. At a minimum, manufacturers may be required to perform this disablement on critical inputs and outputs where lack of the input and output disables an entire monitor as described in this paragraph (k)(7)(vii), disables multiple monitors (e.g., two or more) used by the onboard computer, or renders the entire onboard computer and its functions inoperative.

(viii) Clean alternative fuel conversion manufacturers must use good engineering judgment to induce malfunctions and may perform more stringent malfunction demonstrations than described in this paragraph (k)(7). In addition, the Administrator reserves the right to request a clean alternative fuel conversion manufacturer to perform stricter demonstration requirements, to the extent feasible, on clean alternative fuel conversions.

(1) *Phase-in for complete heavy-duty vehicles.* Complete heavy-duty vehicles weighing 14,000 pounds GVWR or less that are not Otto-cycle MDPVs must meet the OBD requirements of this section according to the following phase-in schedule, based on the percentage of projected vehicle sales. The 2004 model year requirements in the following phase-in schedule are applicable only to heavy-duty Otto-cycle vehicles where the manufacturer has selected Otto-cycle Option 1 or 2 for alternative 2003 or 2004 compliance according to § 86.004-01(c)(1) or (2). The 2005 through 2007 requirements in the following phase-in schedule apply to all heavy-duty vehicles weighing 14,000 pounds GVWR or less, excluding MDPVs. If the manufacturer has selected Otto-cycle Option 3 it may exempt 2005 model year complete heavy-duty engines and vehicles whose model year commences before July 31, 2004 from the requirements of this section. For the purposes of calculating compliance with the phase-in provisions of this paragraph (1), heavy-duty vehicles subject to the phase-in requirements of this section

may be combined with heavy-duty vehicles subject to the phase-in requirements of paragraph § 86.005-17 (k). The phase-in schedule follows:

OBD COMPLIANCE PHASE-IN FOR COMPLETE HEAVY-DUTY VEHICLES WEIGHING 14,000 POUNDS GVWR OR LESS

Model year	Phase-in based on projected sales
2004 MY	Applicable only to Otto-cycle engines complying with Options 1 or 2; 40% compliance; alternative fuel waivers available.
2005 MY	60% compliance; alternative fuel waivers available.
2006 MY	80% compliance; alternative fuel waivers available.
2007 MY	80% compliance; alternative fuel waivers available.
2008+ MY	100% compliance.

(m) *Thresholds for California OBD II Compliance Option.* For the purposes of complying with the provisions set forth above in paragraph (j), vehicles certified to Tier 2 standards shall utilize multiplicative factors from the California vehicle type (i.e. LEV II, ULEV II) corresponding to the Tier 2 to which the vehicles are certified. Vehicles certified to Tier 2, Bin 4 emissions standards shall utilize the Tier 2 Bin 4 emission standards and the CARB ULEV II multiplicative factors to determine the appropriate OBD malfunction threshold for all pollutants except NO_x, for which they shall utilize that CARB SULEV II multiplicative factors. Vehicles certified to Tier 2, Bin 3 emissions standards shall utilize the Tier 2 Bin 3 emission standards and the CARB ULEV II multiplicative factors to determine the appropriate OBD malfunction threshold for all pollutants except NO_x, for which they shall utilize that CARB SULEV II multiplicative factors. Vehicles certified to Tier 2, Bin 2 emissions standards shall utilize the Tier 2 Bin 2 emission standards and the CARB SULEV II multiplicative factors to determine the appropriate OBD malfunction threshold. Vehicles certified to Tier 2 Bin 7 or higher shall utilize the CARB LEV II multiplicative factors to determine the appropriate OBD malfunction threshold.

(n) For 2007 and later model year diesel complete heavy-duty vehicles, in lieu of the malfunction descriptions of paragraph (b) of this section, the malfunction descriptions of this paragraph

(n) shall apply. The OBD system must detect and identify malfunctions in all monitored emission-related powertrain systems or components according to the following malfunction definitions as measured and calculated in accordance with test procedures set forth in subpart B of this part (chassis-based test procedures), excluding those test procedures defined as “Supplemental” test procedures in § 86.004–2 and codified in §§ 86.158, 86.159, and 86.160.

(1) *Catalysts and diesel particulate filters (DPF)*. (i) If equipped, reduction catalyst deterioration or malfunction before it results in exhaust emissions exceeding, for model years 2007 through 2009, 4 times the applicable NO_x standard and, for model years 2010 through 2012, the applicable NO_x standard+0.6 g/mi and, for model years 2013 and later, the applicable NO_x standard+0.3 g/mi. Further, if equipped, oxidation catalyst (not to include the DPF), deterioration or malfunction before it results in exhaust NMHC emissions exceeding, for 2010 through 2012 model years, 2.5 times the applicable NMHC standard and, for 2013 and later model years, 2 times the applicable NMHC standard. Monitoring of oxidation catalysts is not required through the 2009 model year. These catalyst monitoring need not be done if the manufacturer can demonstrate that deterioration or malfunction of the system will not result in exceedance of the threshold. As an alternative to the oxidation catalyst monitoring requirement, the monitor can be designed to detect oxidation catalyst deterioration or malfunction before it results in an inability to achieve a temperature rise of 100 degrees C, or to reach the necessary DPF regeneration temperature, within 60 seconds of initiating an active DPF regeneration. Further, oxidation catalyst deterioration or malfunction when the DOC is unable to sustain the necessary regeneration temperature for the duration of the regeneration event. The OBD or control system must abort the regeneration if the regeneration temperature has not been reached within five minutes of initiating an active regeneration event, and if the regeneration temperature cannot be sustained for the duration of the regeneration event.

(ii) If equipped with a DPF, for all model years, catastrophic failure of the device must be detected. Any DPF whose complete failure results in exhaust emissions exceeding 1.5 times the applicable PM standard or family emissions limit (FEL) must be monitored for such catastrophic failure. This monitoring need not be done if the manufacturer can demonstrate that a catastrophic failure of the system will not result in exceedance of the threshold. Further, if equipped with a DPF, the OBD system shall detect DPF deterioration or malfunction before it results in exhaust emissions exceeding, for 2010 through 2012 model years, 4 times the applicable PM standard and, for 2013 and later model years, the applicable PM standard +0.04 g/mi.

(2) *Engine misfire*. Lack of cylinder combustion must be detected.

(3) *Exhaust gas sensors*—(i) *Oxygen sensors and air-fuel ratio sensors downstream of aftertreatment devices*. If equipped, sensor deterioration or malfunction resulting in exhaust emissions exceeding any of the following levels: for 2007 through 2009 model years, 4 times the applicable PM standard, or 3 times the applicable NO_x standard, or 2.5 times the applicable NMHC standard and, for 2010 through 2012 model years, 4 times the applicable PM standard, or the applicable NO_x standard+0.3 g/mi, or 2.5 times the applicable NMHC standard and, for 2013 and later model years, the applicable PM standard+0.04 g/mi, or the applicable NO_x standard+0.3 g/mi, or 2 times the applicable NMHC standard.

(ii) *Oxygen sensors and air-fuel ratio sensors upstream of aftertreatment devices*. If equipped, sensor deterioration or malfunction resulting in exhaust emissions exceeding any of the following levels: for 2007 through 2009 model years, 4 times the applicable PM standard, or 3 times the applicable NO_x standard, or 2.5 times the applicable NMHC standard, or 2.5 times the applicable CO standard and, for 2010 through 2012 model years, the applicable PM standard+0.02 g/mi, or the applicable NO_x standard+0.3 g/mi, or 2.5 times the applicable NMHC standard, or 2.5 times the applicable CO standard and, for 2013 and later model years, the applicable

PM standard+0.02 g/mi, or the applicable NO_x standard+0.3 g/mi, or 2 times the applicable NMHC standard, or 2 times the applicable CO standard.

(iii) *NO_x sensors.* If equipped, sensor deterioration or malfunction resulting in exhaust emissions exceeding any of the following levels: for 2007 through 2009 model years, 5 times the applicable PM standard, or 4 times the applicable NO_x standard and, for 2010 through 2012 model years, 4 times the applicable PM standard, or the applicable NO_x standard+0.6 g/mi and, for 2013 and later model years, the applicable PM standard+0.04 g/mi, or the applicable NO_x standard+0.3 g/mi.

(4) [Reserved]

(5) *Other emission control systems and components.* Any deterioration or malfunction occurring in an engine system or component directly intended to control emissions, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding any of the following levels: For 2007 through 2009 model years, 4 times the applicable PM standard, or 3 times the applicable NO_x standard, or 2.5 times the applicable NMHC standard, or 2.5 times the applicable CO standard and, for 2010 through 2012 model years, 4 times the applicable PM standard, or the applicable NO_x standard+0.3 g/mi, or 2.5 times the applicable NMHC standard, or 2.5 times the applicable CO standard and, for 2013 and later model years, the applicable PM standard+0.02 g/mi, or the applicable NO_x standard+0.3 g/mi, or 2 times the applicable NMHC standard, or 2 times the applicable CO standard. A functional check, as described in paragraph (n)(6) of this section, may satisfy the requirements of this paragraph (n)(5) provided the manufacturer can demonstrate that a malfunction would not cause emissions to exceed the applicable levels. This demonstration is subject to Administrator approval. For engines equipped with crankcase ventilation (CV), monitoring of the CV system is not necessary provided the manufacturer can demonstrate to the Administrator's satisfaction that the CV system is unlikely to fail.

(6) *Other emission-related powertrain components.* Any other deterioration or malfunction occurring in an electronic emission-related powertrain system or component not otherwise described in paragraphs (n)(1) through (n)(5) of this section that either provides input to or receives commands from the on-board computer and has a measurable impact on emissions; monitoring of components required by this paragraph (n)(6) must be satisfied by employing electrical circuit continuity checks and rationality checks for computer input components (input values within manufacturer specified ranges based on other available operating parameters), and functionality checks for computer output components (proper functional response to computer commands) except that the Administrator may waive such a rationality or functionality check where the manufacturer has demonstrated infeasibility. Malfunctions are defined as a failure of the system or component to meet the electrical circuit continuity checks or the rationality or functionality checks.

(7) *Performance of OBD functions.* Any sensor or other component deterioration or malfunction which renders that sensor or component incapable of performing its function as part of the OBD system must be detected and identified on engines so equipped.

(o) For 2007 and later model year diesel complete heavy-duty vehicles, in lieu of the certification provisions of paragraph (k) of this section, the certification provisions of this paragraph (o) shall apply. For test groups required to have an OBD system, certification will not be granted if, for any test vehicle approved by the Administrator in consultation with the manufacturer, the malfunction indicator light does not illuminate under any of the following circumstances, unless the manufacturer can demonstrate that any identified OBD problems discovered during the Administrator's evaluation will be corrected on production vehicles.

(1)(i) If monitored for emissions performance—a reduction catalyst is replaced with a deteriorated or defective catalyst, or an electronic simulation of such, resulting in exhaust emissions exceeding, for 2007 through 2009 model

years, 4 times the applicable NO_x standard and, for 2010 through 2012 model years, the applicable NO_x standard+0.6 g/mi and, for 2013 and later model years, the applicable NO_x standard+0.3 g/mi. Also if monitored for emissions performance-an oxidation catalyst (not to include the DPF) is replaced with a deteriorated or defective catalyst, or an electronic simulation of such, resulting in exhaust NMHC emissions exceeding, for 2010 through 2012 model years, 2.5 times the applicable NMHC standard and, for 2013 and later model years, 2 times the applicable NMHC standard. If monitored for exotherm performance for 2010 and later model years, an oxidation catalyst is replaced with a deteriorated or defective catalyst, or an electronic simulation of such, resulting in an inability to achieve a 100 degree C temperature rise, or the necessary regeneration temperature, within 60 seconds of initiating a DPF regeneration.

(ii) If monitored for performance—a DPF is replaced with a DPF that has catastrophically failed, or an electronic simulation of such. Further, a DPF is replaced with a deteriorated or defective DPF, or an electronic simulation of such, resulting in exhaust PM emissions exceeding, for 2010 through 2012 model years, 4 times the applicable PM standard and, for 2013 and later model years, the applicable PM standard+0.04 g/mi.

(2) An engine misfire condition is induced and is not detected.

(3)(i) If so equipped, any oxygen sensor or air-fuel ratio sensor located downstream of aftertreatment devices is replaced with a deteriorated or defective sensor, or an electronic simulation of such, resulting in exhaust emissions exceeding any of the following levels: for 2007 through 2009 model years, 4 times the applicable PM standard, or 3 times the applicable NO_x standard, or 2.5 times the applicable NMHC standard and, for 2010 through 2012 model years, 4 times the applicable PM standard, or the applicable NO_x standard+0.3 g/mi, or 2.5 times the applicable NMHC standard and, for 2013 and later model years, the applicable PM standard+0.04 g/mi, or the applicable NO_x standard+0.3 g/mi, or 2 times the applicable NMHC standard.

(ii) If so equipped, any oxygen sensor or air-fuel ratio sensor located upstream of aftertreatment devices is replaced with a deteriorated or defective sensor, or an electronic simulation of such, resulting in exhaust emissions exceeding any of the following levels: for 2007 through 2009 model years, 4 times the applicable PM standard, or 3 times the applicable NO_x standard, or 2.5 times the applicable NMHC standard, or 2.5 times the applicable CO standard and, for 2010 through 2012 model years, the applicable PM standard+0.02 g/mi, or the applicable NO_x standard+0.3 g/mi, or 2.5 times the applicable NMHC standard, or 2.5 times the applicable CO standard and, for 2013 and later model years, the applicable PM standard+0.02 g/mi, or the applicable NO_x standard+0.3 g/mi, or 2 times the applicable NMHC standard, or 2 times the applicable CO standard.

(iii) If so equipped, any NO_x sensor is replaced with a deteriorated or defective sensor, or an electronic simulation of such, resulting in exhaust emissions exceeding any of the following levels: for 2007 through 2009 model years, 5 times the applicable PM standard, or 4 times the applicable NO_x standard and, for 2010 through 2012 model years, 4 times the applicable PM standard, or the applicable NO_x standard+0.6 g/mi and, for 2013 and later model years, the applicable PM standard+0.04 g/mi, or the applicable NO_x standard+0.3 g/mi.

(4) [Reserved]

(5) A malfunction condition is induced in any emission-related engine system or component, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding any of the following levels: for 2007 through 2009 model years, 4 times the applicable PM standard or 3 times the applicable NO_x standard, or 2.5 times the applicable NMHC standard, or 2.5 times the applicable CO standard and, for 2010 through 2012 model years, 4 times the applicable PM standard, or the applicable NO_x standard+0.3 g/mi, or 2.5 times the applicable NMHC standard, or 2.5 times the applicable CO standard and, for 2013 and later model years, the applicable

PM standard+0.02 g/mi, or the applicable NO_x standard+0.3 g/mi, or 2 times the applicable NMHC standard, or 2 times the applicable CO standard.

(6) A malfunction condition is induced in an electronic emission-related powertrain system or component not otherwise described in this paragraph (o) that either provides input to or receives commands from the on-board computer resulting in a measurable impact on emissions.

[65 FR 59965, Oct. 6, 2000, as amended at 66 FR 5189, Jan. 18, 2001; 68 FR 35799, June 17, 2003; 70 FR 75410, Dec. 20, 2005; 71 FR 51488, Aug. 30, 2006; 71 FR 78094, Dec. 28, 2006; 74 FR 8420, Feb. 24, 2009; 75 FR 25685, May 7, 2010; 76 FR 57377, Sept. 15, 2011; 79 FR 23708, Apr. 28, 2014]

§ 86.1806–17 Onboard diagnostics.

Model year 2017 and later vehicles must have onboard diagnostic (OBD) systems as described in this section. OBD systems must generally detect malfunctions in the emission control system, store trouble codes corresponding to detected malfunctions, and alert operators appropriately.

(a) Vehicles must comply with the 2013 OBD requirements adopted for California as described in this paragraph (a). California's 2013 OBD-II requirements are part of Title 13, §1968.2 of the California Code of Regulations, approved on July 31, 2013 (incorporated by reference in §86.1). The following clarifications and exceptions apply for vehicles certified under this subpart:

(1) For vehicles not certified in California, references to vehicles meeting certain California Air Resources Board emission standards are understood to refer to the corresponding EPA emission standards for a given family, where applicable. Use good engineering judgment to correlate the specified standards with the bin standards that apply under this subpart.

(2) Vehicles must comply with OBD requirements throughout the useful life as specified in §86.1805. If the specified useful life is different for evaporative and exhaust emissions, the useful life specified for evaporative emissions applies for monitoring related to fuel-system leaks and the useful life specified for exhaust emissions applies for all other parameters.

(3) The purpose and applicability statements in 13 CCR 1968.2(a) and (b) do not apply.

(4) The anti-tampering provisions in 13 CCR 1968.2(d)(1.4) do not apply.

(5) The requirement to verify proper alignment between the camshaft and crankshaft described in 13 CCR 1968.2(e)(15.2.1)(C) applies only for vehicles equipped with variable valve timing.

(6) The deficiency provisions described in paragraph (c) of this section apply instead of 13 CCR 1968.2(k).

(7) For emergency vehicles only, the provisions of 13 CCR 1968.2(e)(6.2.1) related to monitoring and identification of air-fuel ratio cylinder imbalance, as part of the fuel system monitoring, do not apply until model year 2020, unless the vehicle met the requirements in 2016 or earlier model years.

(8) Apply thresholds for exhaust emission malfunctions from Tier 3 vehicles based on the thresholds calculated for the corresponding bin standards in the California LEV II program as prescribed for the latest model year in CCR 1968.2(e)(1) through (3). For example, for Tier 3 Bin 160 standards, apply the threshold that applies for the LEV standards. For cases involving Tier 3 standards that have no corresponding bin standards from the California LEV II program, use the next highest LEV II bin. For example, for Tier 3 Bin 50 standards, apply the threshold that applies for the ULEV standards. You may apply thresholds that are more stringent than we require under this paragraph (a)(8).

(b) The following additional provisions apply:

(1) Model year 2017 and later vehicles must meet the OBD system requirements described in this paragraph (b)(1). When monitoring conditions are satisfied, test vehicles must detect the presence of a leak with an effective leak diameter at or above 0.020 inches, illuminate the MIL, and store the appropriate confirmed diagnostic trouble codes (DTCs) (13 CCR 1968.2 refers to these as fault codes). For a 0.020 inch leak, the DTC(s) shall be a generic SAE J2012 DTC that is specific to an EVAP system very small leak (e.g., P0456, P0457, or P0458) or an equivalent

manufacturer-specific DTC that we approve. Conduct testing using an O'Keefe Controls Co. metal "Type B" orifice with a diameter of 0.020 inches or an alternate orifice diameter approved under 13 CCR 1968.2(e)(4.2.3) or (e)(4.2.4).

(i) Use the methodology specified in 13 CCR 1968.2(h)(2.2) to select test vehicles to demonstrate that the OBD system is capable of detecting a 0.020 inch leak installed in the evaporative system, except that the manufacturer may use production-representative vehicles instead of the vehicle options specified in 13 CCR 1968.2(h)(2.3).

(ii) Perform tests in the laboratory, with or without a dynamometer, or on an outdoor road surface, as necessary to exercise the vehicle's ability to detect leaks in the evaporative system.

(iii) Perform at least two tests to evaluate the OBD system for leaks that are installed near the fuel fill pipe and near the canister. The implanted leak near the fuel fill pipe must be at the fuel cap or between the fuel cap and the fuel tank. The implanted leak near the canister must be in the vapor line between the canister and the fuel tank, or between the canister and the purge valve). If a vehicle has multiple canisters or fuel fill pipes, repeat the testing to evaluate the system for implanted leaks corresponding to each canister and fuel fill pipe. You may propose to implant leaks in different locations (e.g., near the purge valve); we will approve your alternate leak location if it more effectively demonstrates leak detection for your particular fuel system design.

(iv) If vehicle operation is needed to fulfill preconditioning (i.e., when engine-off tests require driving before vehicle shutdown to enable the engine-off monitor) or monitoring conditions for leak detection under this paragraph (b)(1) utilize an FTP cycle, Unified cycle, or some other specified operating cycle that will satisfy the approved monitoring or preconditioning conditions without the interference of approved deficiencies. Continue vehicle operation as needed to illuminate the MIL and store the appropriate DTCs.

(v) Emission measurements are not required during this OBD evaporative

system leak monitoring demonstration testing.

(vi) For test groups not selected for testing in a given model year, you may instead provide a statement in the application for certification, consistent with good engineering judgment, that vehicles meet leak-detection requirements based on previous OBD tests, development tests, or other appropriate information. For any untested test groups, the statement specified in § 86.1844-01(d)(8) applies with regard to the leak monitoring requirement. We may ask you to provide the data and other information that formed the basis for your statement. Select test groups in later model years such that testing will rotate to cover your whole product line over time.

(vii) Submit the following information in the application for certification:

(A) Describe the test sequence.

(B) Identify the driving cycle used and the time expired and distance driven before the MIL illuminated.

(C) Identify the ranges of in-use environmental and vehicle operating conditions for which the vehicle will not meet the leak-detection specifications described in this paragraph (b)(1). To meet this requirement, you may give us the same information you gave the California Air Resources Board regarding enable conditions for the evaporative system leak monitor.

(D) Identify the confirmed and permanent DTCs set by the OBD system during testing.

(E) Include the freeze frame information stored at the point the fault is detected.

(F) Include the SAE J1979 test results (e.g., Mode/Service \$06) corresponding to the DTCs that were stored during the test.

(viii) If you have one or more vehicle models in model year 2016 that do not comply with the leak requirements in 13 CCR 1968.2(e)(4), you may comply with the requirements of this paragraph (b)(1) in model year 2017 by substituting model year 2016 vehicles on an equal-percentage basis. Demonstrate this by calculating the percentage of vehicles subject to OBD requirements under this subpart that

meet the requirements of this paragraph (b)(1) in model years 2016 and 2017; the sum of these two percentage values must be at or above 100 percent. Any model year 2017 vehicles not meeting the requirements of this paragraph (b)(1), as allowed by this paragraph (b)(1)(viii), may not be counted as compliant Tier 3 vehicles under the alternative phase-in specified in § 86.1813-17(g)(2)(ii).

(2) For vehicles subject to the leak standard in § 86.1813, OBD systems must record in computer memory the result of the most recent successfully completed diagnostic check for a 0.020 inch leak. Someone must be able to use the data to determine the miles driven since the last check occurred, the pass/fail result, and whether there has been a check since the computer memory was last cleared (e.g., from a scan tool command or battery disconnect). The system may be designed to keep data only from the previous 750 miles of driving. (Note: This 750 mile requirement is related to the use of the OBD evaporative leak monitor in the leak test and should not be confused with either the minimum or maximum distance values specified in Table G-19 of SAE J1979.) The data must be reported in a standardized format consistent with other data required for the OBD system. The results must be scan-readable.

(3) For vehicles with fuel tanks exceeding 25 gallons nominal fuel tank capacity, you may request our approval for a leak threshold greater than 0.020 inches, up to a maximum value of 0.040 inches. We will generally approve a leak threshold equal to the standard that applies under § 86.1813.

(c) You may ask us to accept as compliant a vehicle that does not fully meet specific requirements under this section. Such deficiencies are intended to allow for minor deviations from OBD standards under limited conditions. We expect vehicles to have functioning OBD systems that meet the objectives stated in this section. The following provisions apply regarding OBD system deficiencies:

(1) Except as specified in paragraph (d) of this section, we will not approve a deficiency that involves the complete lack of a major diagnostic monitor,

such as monitors related to exhaust aftertreatment devices, oxygen sensors, air-fuel ratio sensors, NO_x sensors, engine misfire, evaporative leaks, and diesel EGR (if applicable).

(2) We will approve a deficiency only if you show us that full compliance is infeasible or unreasonable considering any relevant factors, such as the technical feasibility of a given monitor, or the lead time and production cycles of vehicle designs and programmed computing upgrades.

(3) Our approval for a given deficiency applies only for a single model year, though you may continue to ask us to extend a deficiency approval in renewable one-year increments. We may approve an extension if you demonstrate an acceptable level of effort toward compliance and show that the necessary hardware or software modifications would pose an unreasonable burden.

(d) For alternative-fuel vehicles, manufacturers may request a waiver from specific requirements for which monitoring may not be reliable for operation with the alternative fuel. However, we will not waive requirements that we judge to be feasible for a particular manufacturer or vehicle model.

(e) For alternative-fuel conversions, manufacturers may meet the requirements of § 86.1806-05 instead of the requirements of this section.

(f) You may ask us to waive certain requirements in this section for emergency vehicles. We will approve your request for an appropriate duration if we determine that the OBD requirement in question could harm system performance in a way that would impair a vehicle's ability to perform its emergency functions.

(g) The following interim provisions describe an alternate implementation schedule for the requirements of this section in certain circumstances:

(1) Manufacturers may delay complying with all the requirements of this section, and instead meet all the requirements that apply under § 86.1806-05, for any heavy-duty vehicles that are not yet subject to the Tier 3 standards in § 86.1816.

(2) Except as specified in this paragraph (g)(2), small-volume manufacturers may delay complying with all the

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requirements of this section until model year 2022, and instead meet all the requirements that apply under § 86.1806-05 during those years. This provision does not apply for a vehicle model if it is identical to a 2016 vehicle model that was certified to meet California's OBD requirements under § 86.1806-05(j)(3). A vehicle model is considered identical to one from model year 2016 if it is certified in the current year based on the same test data for exhaust or evaporative emissions under the carryover data provisions of this subpart.

(3) Manufacturers may disregard the requirements of this section that apply above 8,500 pounds GVWR before model year 2019 and instead meet all the requirements that apply under § 86.1806-05. This also applies for model year 2019 vehicles from a test group with vehicles that have a Job 1 date on or before March 3, 2018 (see 40 CFR 85.2304).

[79 FR 23709, Apr. 28, 2014]

§ 86.1807-01 Vehicle labeling.

(a) The manufacturer of any motor vehicle subject to the applicable emission standards of this subpart, shall, at the time of manufacture, affix a permanent legible label, of the type and in the manner described in this section, containing the information prescribed in this section, to all production models of such vehicles available for sale to the public and covered by a Certificate of Conformity under § 86.1848-01.

(1) A permanent, legible label shall be affixed in a readily visible position in the engine compartment.

(2) The label shall be affixed by the vehicle manufacturer who has been issued the Certificate of Conformity for such vehicle, in such manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(3) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label:

(i) The label heading: Vehicle Emission Control Information;

(ii) Full corporate name and trademark of manufacturer;

(iii) Engine displacement (in cubic inches or liters), test group identification and evaporative/refueling family identification;

(iv) [Reserved]

(v) An unconditional statement of compliance with the appropriate model year U.S. EPA regulations which apply to light-duty vehicles, light-duty trucks, medium-duty passenger vehicles, or complete heavy-duty vehicles;

(vi) The exhaust emission standards (or FEL, as applicable) to which the test group is certified, and for test groups having different in-use standards, the corresponding exhaust emission standards that the test group must meet in use. In lieu of this requirement, manufacturers may use the standardized test group name designated by EPA;

(vii) [Reserved]

(viii) Vehicles granted final admission under 40 CFR 85.1505 must comply with the labeling requirements contained in 40 CFR 85.1510;

(ix) [Reserved]

(x) For vehicles designed to be capable of operating on fuels other than gasoline or diesel, the statement "This vehicle is certified to operate on [specify fuel(s)]".

(b) The provisions of this section shall not prevent a manufacturer from also reciting on the label that such vehicle (or engine) conforms to any applicable state emission standards for new motor vehicles (or new motor vehicle engines) or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle (or engine).

(c)(1) The manufacturer of any light-duty vehicle, light-duty truck, medium-duty passenger vehicle, or heavy-duty vehicle subject to the emission standards of this subpart shall, in addition and subsequent to setting forth those statements on the label required by the Department of Transportation (DOT) pursuant to 49 CFR 567.4 set forth on the DOT label or on an additional label located in proximity to the DOT label and affixed as described in 49 CFR 567.4(b), the following information in the English language, lettered in block letters and numbers not less than three thirty-seconds of an inch

high, of a color that contrasts with the background of the label:

(i) The heading: "Vehicle Emission Control Information."

(ii)(A) For light-duty vehicles, the statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to XXX-Fueled 20XX Model Year New Motor Vehicles."

(B) For light-duty trucks, the statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to XXX-Fueled 20XX Model Year New Light-Duty Trucks."

(C) For medium-duty passenger vehicles, the statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to XXX-fueled 20XX Model Year New Medium-Duty Passenger Vehicles."

(D) For heavy-duty vehicles, the statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to XXX-fueled 20XX Model Year Chassis-Certified New Heavy-Duty Vehicles."

(iii) [Reserved]

(2)-(3) [Reserved]

(d)(1) Incomplete light-duty trucks shall have the following prominent statement printed on the label required by paragraph (a)(3)(v) of this section: "This vehicle conforms to U.S. EPA regulations applicable to 20xx Model year Light-Duty Trucks under the special provisions of 40 CFR 86.1801-01(c)(1) when it does not exceed XXX pounds in curb weight, XXX pounds in gross vehicle weight rating, and XXX square feet in frontal area."

(2) Incomplete heavy-duty vehicles optionally certified in accordance with the provisions for complete heavy-duty vehicles under the special provisions of § 86.1801-01(c)(2) shall have the following prominent statement printed on the label required by paragraph (a)(3)(v) of this section: "This vehicle conforms to U.S. EPA regulations applicable to 20xx Model year Complete Heavy-Duty Vehicles under the special provisions of 40 CFR 86.1801-01(c)(2) when it does not exceed XXX pounds in curb weight, XXX pounds in gross vehicle weight rating, and XXX square feet in frontal area."

(e) The manufacturer of any incomplete light-duty vehicle, light-duty truck, or heavy-duty vehicle shall notify the purchaser of such vehicle of

any curb weight, frontal area, or gross vehicle weight rating limitations affecting the emission certificate applicable to that vehicle. This notification shall be transmitted in a manner consistent with National Highway Traffic Safety Administration safety notification requirements published in 49 CFR part 568.

(f) All light-duty vehicles, light-duty trucks, medium-duty passenger vehicles, and complete heavy-duty vehicles shall comply with SAE Recommended Practices J1877 "Recommended Practice for Bar-Coded Vehicle Identification Number Label," (July 1994). SAE J1877 is incorporated by reference (see § 86.1).

(g) The Administrator may approve in advance other label content and formats provided the alternative label contains information consistent with this section.

(h) Vehicles powered by model year 2007 through 2013 diesel-fueled engines must include permanent readily visible labels on the dashboard (or instrument panel) and near all fuel inlets that state "Use Ultra Low Sulfur Diesel Fuel Only" or "Ultra Low Sulfur Diesel Fuel Only".

(i) For vehicles with one or more approved AECDs for emergency vehicles under paragraph (4) of the definition of "defeat device" in § 86.1803, include the following statement on the emission control information label: "THIS VEHICLE HAS A LIMITED EXEMPTION AS AN EMERGENCY VEHICLE."

[64 FR 23925, May 4, 1999, as amended at 65 FR 6853, Feb. 10, 2000; 65 FR 59969, Oct. 6, 2000; 70 FR 72928, Dec. 8, 2005; 77 FR 34146, June 8, 2012; 79 FR 23711, Apr. 28, 2014]

§ 86.1808-01 Maintenance instructions.

(a) The manufacturer shall furnish or cause to be furnished to the purchaser of each new motor vehicle subject to the standards prescribed in this subpart, as applicable, written instructions for the proper maintenance and use of the vehicle, by the purchaser consistent with the provisions of § 86.1834-01, which establishes what scheduled maintenance the Administrator approves as being reasonable and necessary.

(1) The maintenance instructions required by this section shall be in clear,

and to the extent practicable, nontechnical language.

(2) The maintenance instructions required by this section shall contain a general description of the documentation which the manufacturer will require from the ultimate purchaser or any subsequent purchaser as evidence of compliance with the instructions.

(b) Instructions provided to purchasers under paragraph (a) of this section shall specify the performance of all scheduled maintenance performed by the manufacturer on certification durability vehicles and, in cases where the manufacturer performs less maintenance on certification durability data vehicles than the allowed limit, may specify the performance of any scheduled maintenance allowed under § 86.1834-01.

(c) Scheduled emission-related maintenance in addition to that performed under § 86.1834-01 may only be recommended to offset the effects of abnormal in-use operating conditions, except as provided in paragraph (d) of this section. The manufacturer shall be required to demonstrate, subject to the approval of the Administrator, that such maintenance is reasonable and technologically necessary to assure the proper functioning of the emission control system. Such additional recommended maintenance shall be clearly differentiated, in a form approved by the Administrator, from that approved under § 86.1834-01.

(d) Inspections of emission-related parts or systems with instructions to replace, repair, clean, or adjust the parts or systems if necessary, are not considered to be items of scheduled maintenance which insure the proper functioning of the emission control system. Such inspections, and any recommended maintenance beyond that approved by the Administrator as reasonable and necessary under paragraphs (a), (b), and (c) of this section, may be included in the written instructions furnished to vehicle owners under paragraph (a) of this section, provided that such instructions clearly state, in a form approved by the Administrator, that the owner need not perform such inspections or recommended maintenance in order to maintain the emis-

sion warranty or manufacturer recall liability.

(e) If the vehicle has been granted an alternative useful life period under the provisions of § 86.1805-01(c), the manufacturer may choose to include in such instructions an explanation of the distinction between the alternative useful life specified on the label, and the emissions defect and emissions performance warranty period. The explanation must clearly state that the useful life period specified on the label represents the average period of use up to retirement or rebuild for the test group represented by the engine used in the vehicle. An explanation of how the actual useful lives of engines used in various applications are expected to differ from the average useful life may be included. The explanation(s) shall be in clear, non-technical language that is understandable to the ultimate purchaser.

(f) Emission control diagnostic service information:

(1) *Applicability.* Manufacturers are subject to the provisions of this paragraph (f) for 1996 model year for and later light-duty vehicles and light-duty trucks. Manufacturers are subject to the provisions of this paragraph (f) for 2005 model year and later heavy-duty vehicles at or below 14,000 pounds GVWR and the corresponding engines that are subject to the OBD requirements of this part.

(2) *General requirements.* (i) Manufacturers shall furnish or cause to be furnished to any person engaged in the repairing or servicing of motor vehicles or motor vehicle engines, or the Administrator upon request, any and all information needed to make use of the on-board diagnostic system and such other information, including instructions for making emission-related diagnoses and repairs, including but not limited to service manuals, technical service bulletins, recall service information, bi-directional control information, and training information, unless such information is protected by section 208(c) of the Act as a trade secret. No such information may be withheld under section 208(c) of the Act if that information is provided (directly or indirectly) by the manufacturer to franchised dealers or other persons engaged

in the repair, diagnosing, or servicing of motor vehicles or motor vehicle engines.

(ii) *Definitions.* The following definitions apply for this paragraph (f):

(A) Aftermarket service provider means any individual or business engaged in the diagnosis, service, and repair of a motor vehicle or engine, who is not directly affiliated with a manufacturer or manufacturer-franchised dealership.

(B) Bi-directional control means the capability of a diagnostic tool to send messages on the data bus that temporarily overrides the module's control over a sensor or actuator and gives control to the diagnostic tool operator. Bi-directional controls do not create permanent changes to engine or component calibrations.

(C) Data stream information means information (i.e., messages and parameters) originated within the vehicle by a module or intelligent sensors (i.e., a sensor that contains and is controlled by its own module) and transmitted between a network of modules and/or intelligent sensors connected in parallel with either one or more communication wires. The information is broadcast over the communication wires for use by the OBD system to gather information on emissions-related components or systems and from other vehicle modules that may impact emissions, including but not limited to systems such as chassis or transmission. For the purposes of this section, data stream information does not include engine calibration related information, or any data stream information from systems or modules that do not impact emissions.

(D) Emissions-related information means any information related to the diagnosis, service, and repair of emissions-related components. Emissions-related information includes, but is not limited to, information regarding any system, component or part of a vehicle that controls emissions and any system, component and/or part associated with the powertrain system, including, but not limited to:

(1) The engine, the fuel system and ignition system;

(2) Information for any system, component or part that is likely to impact

emissions, such as transmission systems, and any other information specified by the Administrator to be relevant to the diagnosis and repair of an emissions-related problem; and

(3) Any other information specified by the Administrator to be relevant for the diagnosis and repair of an emissions-related failure found through the inspection and maintenance program after such finding has been communicated to the affected manufacturer(s).

(E) Emissions-related training information means any information related to training or instruction for the purpose of the diagnosis, service, and repair of emissions-related components.

(F) Enhanced service and repair information means information which is specific for an original equipment manufacturer's brand of tools and equipment. This includes computer or anti-theft system initialization information necessary for the completion of any emissions-related repair on motor vehicles that employ integral vehicle security systems.

(G) Equipment and tool company means a registered automotive equipment or software company either public or private that is engaged in, or plans to engage in, the manufacture of automotive scan tool reprogramming equipment or software.

(H) Generic service and repair information means information which is not specific for an original equipment manufacturer's brand of tools and equipment.

(I) Indirect information means any information that is not specifically contained in the service literature, but is contained in items such as tools or equipment provided to franchised dealers (or others). This includes computer or anti-theft system initialization information necessary for the completion of any emissions-related repair on motor vehicles that employ integral vehicle security systems.

(J) Intermediary means any individual or entity, other than an original equipment manufacturer, which provides service or equipment to aftermarket service providers.

(K) Manufacturer-franchised dealership means any service provider with

which a manufacturer has a direct business relationship.

(L) Third-party information provider means any individual or entity, other than an original equipment manufacturer, who consolidates manufacturer service information and makes this information available to aftermarket service providers.

(M) Third-party training provider means any individual or entity, other than an original equipment manufacturer who develops and/or delivers instructional and educational material for automotive training courses.

(3) *Information dissemination.* Each manufacturer shall provide or cause to be provided to the persons specified in paragraph (f)(2)(i) of this section and to any other interested parties a manufacturer-specific Web site containing the information specified in paragraph (f)(2)(i) of this section for vehicles identified in paragraph (f)(1) of this section that have been offered for sale; this requirement does not apply to indirect information, including the information specified in paragraphs (f)(12) through (f)(16) of this section. Each manufacturer Web site shall—

(i) Provide access in full-text to all of the information specified in paragraph (f)(5) of this section.

(ii) Be updated at the same time as manufacturer-franchised dealership World Wide Web sites;

(iii) Provide users with a description of the minimum computer hardware and software needed by the user to access that manufacturer's information (e.g., computer processor speed and operating system software). This description shall appear when users first log-on to the home page of the manufacturer's Web site.

(iv) Provide Short-Term (24 to 72 hours), Mid-Term (30-day period), and Long-Term (365-day period) Web site subscription options to any person specified in paragraph (f)(2)(i) of this section whereby the user will be able to access the site, search for the information, and purchase, view and print the information at a fair and reasonable cost as specified in paragraph (f)(7) of this section for each of the options. In addition, for each of the subscription options, manufacturers are required to make their entire site accessible for

the respective period of time and price. In other words, a manufacturer may not limit any or all of the subscription options to just one make or one model.

(v) Allow the user to search the manufacturer Web site by various topics including but not limited to model, model year, key words or phrases, etc., while allowing ready identification of the latest vehicle calibration. Manufacturers who do not use model year to classify their vehicles in their service information may use an alternate vehicle delineation such as body series. Any manufacturer utilizing this flexibility shall create a cross-reference to the corresponding model year and provide this cross-reference on the manufacturer Web site home page.

(vi) Provide accessibility using common, readily available software and shall not require the use of software, hardware, viewers, or browsers that are not readily available to the general public. Manufacturers shall also provide hyperlinks to any plug-ins, viewers or browsers (e.g. Adobe Acrobat or Netscape) needed to access the manufacturer Web site.

(vii) Allow simple hyper-linking to the manufacturer Web site from government Web sites and automotive-related Web sites.

(viii) Allow access to the manufacturer Web sites with no limits on the modem speed by which aftermarket service providers or other interested parties can connect to the manufacturer Web site.

(ix) Possess sufficient server capacity to allow ready access by all users and have sufficient capacity to assure that all users may obtain needed information without undue delay.

(x) Correct or delete broken Web links on a weekly basis.

(xi) Allow for Web site navigation that does not require a user to return to the manufacturer home page or a search engine in order to access a different portion of the site.

(xii) Allow all users to print out any and all of the materials required to be made available on the manufacturers Web site, including the ability to print it at the users location.

(4) *Small volume provisions for information dissemination.* (i) Manufacturers

with annual sales of less than 5,000 vehicles shall have until June 28, 2004 to launch their individual Web sites as required by paragraph (f)(3) of this section.

(ii) Manufacturers with annual sales of less than 1,000 vehicles may, in lieu of meeting the requirement of paragraph (f)(3) of this section, request the Administrator to approve an alternative method by which the required emissions-related information can be obtained by the persons specified in paragraph (f)(2)(i) of this section.

(5) *Required information.* All information relevant to the diagnosis and completion of emissions-related repairs shall be posted on manufacturer Web sites. This excludes indirect information specified in paragraphs (f)(6) and (f)(12) through (f)(16) of this section. To the extent that this information does not already exist in some form for their manufacturer-franchised dealerships, manufacturers are required to develop and make available the information required by this section to both their manufacturer-franchised dealerships and the aftermarket. The required information includes, but is not limited to:

(i) Manuals, including subsystem and component manuals developed by a manufacturer's third party supplier that are made available to manufacturer-franchised dealerships, technical service bulletins (TSBs), recall service information, diagrams, charts, and training materials. Manuals and other such service information from third party suppliers are not required to be made available in full-text on manufacturer Web sites as described in paragraph (f)(3) of this section. Rather, manufacturers must make available on the manufacturer Web site as required by paragraph (f)(3) of this section an index of the relevant information and instructions on how to order such third party information. In the alternative, a manufacturer can create a link from its Web site to the Web site(s) of the third party supplier.

(ii) OBD system information which includes, but is not limited to, the following:

(A) A general description of the operation of each monitor, including a de-

scription of the parameter that is being monitored;

(B) A listing of all typical OBD diagnostic trouble codes associated with each monitor;

(C) A description of the typical enabling conditions (either generic or monitor-specific) for each monitor (if equipped) to execute during vehicle operation, including, but not limited to, minimum and maximum intake air and engine coolant temperature, vehicle speed range, and time after engine startup. In addition, manufacturers shall list all monitor-specific OBD drive cycle information for all major OBD monitors as equipped including, but not limited to, catalyst, catalyst heater, oxygen sensor, oxygen sensor heater, evaporative system, exhaust gas re-circulation (EGR), secondary air, and air conditioning system. Additionally, for diesel vehicles under 14,000 pounds GVWR which also perform misfire, fuel system and comprehensive component monitoring under specific driving conditions (i.e., non-continuous monitoring; as opposed to spark ignition engines that monitor these systems under all conditions or continuous monitoring), the manufacturer shall make available monitor-specific drive cycles. Any manufacturer who develops generic drive cycles, either in addition to, or instead of, monitor-specific drive cycles shall also make these available in full-text on manufacturer Web sites;

(D) A listing of each monitor sequence, execution frequency and typical duration;

(E) A listing of typical malfunction thresholds for each monitor;

(F) For OBD parameters for specific vehicles that deviate from the typical parameters, the OBD description shall indicate the deviation and provide a separate listing of the typical values for those vehicles;

(G) Identification and scaling information necessary to interpret and understand data available to a generic scan tool through "mode 6", pursuant to Society of Automotive Engineers SAE J1979, "EE Diagnostic Test Modes" (Incorporated by reference, see § 86.1).

(H) Algorithms, look-up tables, or any values associated with look-up tables are not required to be made available.

(iii) Any information regarding any system, component, or part of a vehicle monitored by the OBD system that could in a failure mode cause the OBD system to illuminate the malfunction indicator light (MIL);

(iv) Any information on other systems that can effect the emission system within a multiplexed system (including how information is sent between emission-related system modules and other modules on a multiplexed bus);

(v) Manufacturer-specific emissions-related diagnostic trouble codes (DTCs) and any related service bulletins, trouble shooting guides, and/or repair procedures associated with these manufacturer-specific DTCs; and

(vi) Information regarding how to obtain the information needed to perform reinitialization of any vehicle computer or anti-theft system following an emissions-related repair.

(6) *Anti-theft system initialization information.* Computer or anti-theft system initialization information and/or related tools necessary for the proper installation of on-board computers or necessary for the completion of any emissions-related repair on motor vehicles that employ integral vehicle security systems or the repair or replacement of any other emission-related part shall be made available at a fair and reasonable cost to the persons specified in paragraph (f)(2)(i) of this section.

(i) Except as provided under paragraph (f)(6)(ii) of this section, manufacturers must make this information available to persons specified in paragraph (f)(2)(i) of this section, such that such persons will not need any special tools or manufacturer-specific scan tools to perform the initialization. Manufacturers may make such information available through, for example, generic aftermarket tools, a pass-through device, or inexpensive manufacturer specific cables.

(ii) A manufacturer may request Administrator approval for an alternative means to re-initialize vehicles for some or all model year vehicles through the

2007 model year by 1 month following the effective date of the final rule. The Administrator shall approve the request only after the following conditions have been met:

(A) The manufacturer must demonstrate that the availability of such information to aftermarket service providers would significantly increase the risk of vehicle theft.

(B) The manufacturer must make available a reasonable alternative means to install or repair computers, or to otherwise repair or replace an emission-related part.

(C) Any alternative means proposed by a manufacturer cannot require aftermarket technicians to use a manufacturer-franchised dealership to obtain information or special tools to re-initialize the anti-theft system. All information must come directly from the manufacturer or a single manufacturer-specified designee.

(D) Any alternative means proposed by a manufacturer must be available to aftermarket technicians at a fair and reasonable price.

(E) Any alternative must be available to aftermarket technicians within twenty-four hours of the initial request.

(F) Any alternative must not require the purchase of a special tool or tools, including manufacturer-specific tools, to complete this repair. Alternatives may include lease of such tools, but only for appropriately minimal cost.

(G) In lieu of leasing their manufacturer-specific tool to meet this requirement, a manufacturer may also release the necessary information to equipment and tool manufacturers for incorporation into aftermarket scan tools. Any manufacturer choosing this option must release the information to equipment and tool manufacturers within 60 days of Administrator approval. Manufacturers may also comply with this requirement using SAE J2534 for some or all model years through model year 2007.

(7) *Cost of required information.* (i) All information required to be made available by this section shall be made available at a fair and reasonable price. In determining whether a price is fair and reasonable, consideration may be

given to relevant factors, including, but not limited to, the following:

(A) The net cost to the manufacturer-franchised dealerships for similar information obtained from manufacturers, less any discounts, rebates, or other incentive programs.

(B) The cost to the manufacturer for preparing and distributing the information, excluding any research and development costs incurred in designing and implementing, upgrading or altering the onboard computer and its software or any other vehicle part or component. Amortized capital costs for the preparation and distribution of the information may be included.

(C) The price charged by other manufacturers for similar information.

(D) The price charged by manufacturers for similar information prior to the launch of manufacturer Web sites.

(E) The ability of aftermarket technicians or shops to afford the information.

(F) The means by which the information is distributed.

(G) The extent to which the information is used, which includes the number of users, and frequency, duration, and volume of use.

(H) Inflation.

(ii) By August 26, 2003, each manufacturer shall submit to the Administrator a request for approval of their pricing structure for their Web sites and amounts to be charged for the information required to be made available under paragraphs (f)(3) and (f)(5) of this section. Subsequent to the approval of the manufacturer Web site pricing structure, each manufacturer shall notify the Administrator upon the increase in price of any one or all of the subscription options of 20 percent or more above the previously approved price, taking inflation into account.

(A) The manufacturer shall submit a request to the Administrator that sets forth a detailed description of the pricing structure and amounts, and support for the position that the pricing structure and amounts are fair and reasonable by addressing, at a minimum, each of the factors specified in paragraph (f)(7)(i) of this section.

(B) The Administrator will act on the request within 180 days following re-

ceipt of a complete request or following receipt of any additional information requested by the Administrator.

(C) The Administrator may decide not to approve, or to withdraw approval for a manufacturer's pricing structure and amounts based on a conclusion that this pricing structure and/or amounts are not, or are no longer, fair and reasonable, by sending written notice to the manufacturer explaining the basis for this decision.

(D) In the case of a decision by the Administrator not to approve or to withdraw approval, the manufacturer shall within three months following notice of this decision, obtain Administrator approval for a revised pricing structure and amounts by following the approval process described in this paragraph (f)(7)(ii).

(8) *Unavailable information.* Any information which is not provided at a fair and reasonable price shall be considered unavailable, in violation of these regulations and section 202(m)(5) of the Clean Air Act.

(9) *Third-party information providers.* By December 24, 2003, manufacturers shall, for model year 2004 and later vehicles and engines, make available to third-party information providers as defined in paragraph (f)(2)(ii) of this section with whom they engage in licensing or business arrangements;

(i) The required emissions-related information as specified in paragraph (f)(5) of this section either:

(A) Directly in electronic format such as diskette or CD-ROM using non-proprietary software, in English; or

(B) Indirectly via a Web site other than that required by paragraph (f)(3) of this section;

(ii) For any manufacturer who utilizes an automated process in their manufacturer-specific scan tool for diagnostic fault trees, the data schema, detail specifications, including category types/codes and vehicle codes, and data format/content structure of the diagnostic trouble trees.

(iii) Manufacturers can satisfy the requirement of paragraph (f)(9)(ii) of this section by making available diagnostic trouble trees on their manufacturer Web sites in full-text.

(iv) Manufacturers are not responsible for the accuracy of the information distributed by third parties. However, where manufacturers charge information intermediaries for information, whether through licensing agreements or other arrangements, manufacturers are responsible for inaccuracies contained in the information they provide to third-party information providers.

(10) *Required emissions-related training information.* By December 24, 2003, for emissions-related training information, manufacturers shall:

(i) Video tape or otherwise duplicate and make available for sale on manufacturer Web sites within 30 days after transmission any emissions-related training courses provided to manufacturer-franchised dealerships via the Internet or satellite transmission;

(ii) Provide on the manufacturer's Web site an index of all emissions-related training information available for purchase by aftermarket service providers for 1994 and newer vehicles. The required information must be made available for purchase within 3 months of model introduction and then must be made available at the same time it is made available to manufacturer-franchised dealerships, whichever is earlier. The index shall describe the title of the course or instructional session, the cost of the video tape or duplicate, and information on how to order the item(s) from the manufacturer Web site. All of the items available must be shipped within 24 hours of the order being placed and are to be made available at a fair and reasonable price as described in paragraph (f)(7) of this section. Manufacturers unable to meet the 24 hour shipping requirement under circumstances where orders exceed supply and additional time is needed by the distributor to reproduce the item being ordered may exceed the 24 hour shipping requirement, but in no instance can take longer than 14 days to ship the item.

(iii) Provide access to third-party training providers as defined in paragraph (f)(2)(ii) of this section all emission-related training courses transmitted via satellite or Internet offered to their manufacturer-franchised dealerships. Manufacturers may not charge

unreasonable up-front fees to third-party training providers for this access, but may require a royalty, percentage, or other arranged fee based on per-use enrollment/subscription basis. Manufacturers may take reasonable steps to protect any copyrighted information and are not required to provide this information to parties that do not agree to such steps.

(11) *Timeliness and maintenance of information dissemination.* (i) General requirements. Subsequent to the initial launch of the manufacturer's Web site, manufacturers must make the information required under paragraph (f)(5) of this section available on their Web site within six months of model introduction, or at the same time it is made available to manufacturer-franchised dealerships, whichever is earlier. After this six-month period, the information must be available and updated on the manufacturer Web site at the same time that the updated information is made available to manufacturer-franchised dealerships, except as otherwise specified in this section.

(ii) *Archived information.* Manufacturers must maintain the required information on their Web sites in full-text as defined in paragraph (f)(5) of this section for a minimum of 15 years after model introduction. Subsequent to this fifteen year period, manufacturers may archive the information in the manufacturer's format of choice and provide an index of the archived information on the manufacturer Web site and how it can be obtained by interested parties. Manufacturers shall index their available information with a title that adequately describes the contents of the document to which it refers. Manufacturers may allow for the ordering of information directly from their Web site, or from a Web site hyperlinked to the manufacturer Web site. In the alternative, manufacturers shall list a phone number and address where aftermarket service providers can call or write to obtain the desired information. Manufacturers must also provide the price of each item listed, as well as the price of items ordered on a subscription basis. To the extent that any additional information is added or

changed for these model years, manufacturers shall update the index as appropriate. Manufacturers will be responsible for ensuring that all information, including information that is distributed through information distributors, is provided within one regular business day of receiving the order. Items that are less than 20 pages (e.g. technical service bulletins) shall be faxed, if requested, to the requestor and distributors are required to deliver the information overnight if requested and paid for by the ordering party. Archived information must be made available on demand and at a fair and reasonable price.

(12) *Reprogramming information.* (i) Manufacturers shall make available to the persons specified in paragraph (f)(2)(i) of this section all emissions-related recalibration or reprogramming events (including driveability reprogramming events that may affect emissions) in the format of its choice at the same time they are made available to manufacturer-franchised dealerships. This requirement takes effect on September 25, 2003, and within 3 months of model introduction for all new model years.

(ii) Manufacturers shall provide persons specified in paragraph (f)(2)(i) of this section with an efficient and cost-effective method for identifying whether the calibrations on vehicles are the latest to be issued. This requirement takes effect on September 25, 2003, and within 3 months of model introduction for all new model years.

(iii) For all 2004 and later OBD vehicles equipped with reprogramming capability, manufacturers shall comply with SAE J2534 (Incorporated by reference, see § 86.1). Any manufacturer who cannot comply with SAE J2534 in model year 2004 may request one year additional lead time from the Administrator.

(iv) For model years 2004 and later, manufacturers shall make available to aftermarket service providers the necessary manufacturer-specific software applications and calibrations needed to initiate pass-through reprogramming. This software shall be able to run on a standard personal computer that utilizes standard operating systems as

specified in SAE J2534 (Incorporated by reference, see § 86.1).

(v) For model years prior to 2004, manufacturers may use SAE J2534 as described above, provided they make available to the aftermarket any additional required hardware (i.e., cables). Manufacturers may not require the purchase or use of a manufacturer-specific scan tool to receive or use this additional hardware. Manufacturers must also make available the necessary manufacturer-specific software applications and calibrations needed to initiate pass-through reprogramming. Manufacturers must also make available to equipment and tool companies any information needed to develop aftermarket equivalents of the manufacturer-specific hardware.

(vi) Manufacturers may take any reasonable business precautions necessary to protect proprietary business information and are not required to provide this information to any party that does not agree to these reasonable business precautions. The requirement to make hardware available and to release the information to equipment and tool companies takes effect on September 25, 2003, and within 3 months of model introduction for all new model years.

(vii) Manufacturers who cannot comply with paragraphs (f)(12)(v) and (f)(12)(vi) of this section shall make available to equipment and tool companies by September 25, 2003 the following information necessary for reprogramming the ECU:

(A) The physical hardware requirements for reprogramming events or tools (e.g. system voltage requirements, cable terminals/pins, connections such as RS232 or USB, wires, etc.).

(B) ECU data communication (e.g. serial data protocols, transmission speed or baud rate, bit timing requirements, etc.).

(C) Information on the application physical interface (API) or layers (descriptions for procedures such as connection, initialization, performing and verifying programming/download, and termination).

(D) Vehicle application information or any other related service information such as special pins and voltages

for reprogramming events or additional vehicle connectors that require enablement and specifications for the enablement.

(E) Information that describes what interfaces or combinations of interfaces are used to deliver calibrations from database media (e.g. PC using CDROM to the reprogramming device e.g. scan tool or black box).

(viii) A manufacturer can propose an alternative to the requirements of paragraph (f)(12)(vii) of this section for how aftermarket service providers can reprogram an ECU. The Administrator will approve this alternative if the manufacturer demonstrates all of the following:

(A) That it cannot comply with paragraph (f)(12)(v) of this section for the vehicles subject to the alternative plan;

(B) That a very small percentage of its vehicles in model years prior to 2004 cannot be reprogrammed with the provisions described in paragraph (f)(12)(v) of this section, or that releasing the information to tool companies would likely not result in this information being incorporated into aftermarket tools; and

(C) That aftermarket service providers will be able to reprogram promptly at a reasonable cost.

(ix) In meeting the requirements of paragraphs (f)(12)(v) through (f)(12)(vii) of this section, manufacturers may take any reasonable business precautions necessary to protect proprietary business information and are not required to provide this information to any party that does not agree to these reasonable business precautions.

(13) *Generic and enhanced information for scan tools.* Manufacturers shall make available to equipment and tool companies all generic and enhanced service information including bi-directional control and data stream information as defined in paragraph (f)(2)(ii) of this section. This requirement applies for 1996 and later model year vehicles.

(i) The information required by this paragraph (f)(13) of this section shall be provided electronically using common document formats to equipment and tool companies with whom they have appropriate licensing, contractual, and/

or confidentiality arrangements. To the extent that a central repository for this information (e.g. the TEK-NET library developed by the Equipment and Tool Institute) is used to warehouse this information, the Administrator shall have free unrestricted access. In addition, information required by paragraph (f)(13) of this section shall be made available to equipment and tool companies who are not otherwise members of any central repository and shall have access if the non-members have arranged for the appropriate licensing, contractual and/or confidentiality arrangements with the manufacturer and/or a central repository.

(ii) In addition to the generic and enhanced information defined in paragraph (f)(2)(ii) of this section, manufacturers shall also make available the following information necessary for developing generic diagnostic scan tools:

(A) The physical hardware requirements for data communication (e.g. system voltage requirements, cable terminals/pins, connections such as RS232 or USB, wires, etc.)

(B) ECU data communication (e.g. serial data protocols, transmission speed or baud rate, bit timing requirements, etc.),

(C) Information on the application physical interface (API) or layers. (i.e., processing algorithms or software design descriptions for procedures such as connection, initialization, and termination),

(D) Vehicle application information or any other related service information such as special pins and voltages or additional vehicle connectors that require enablement and specifications for the enablement.

(iii) Any manufacturer who utilizes an automated process in its manufacturer-specific scan tool for diagnostic fault trees shall make available to equipment and tool companies the data schema, detail specifications, including category types/codes and vehicle codes, and data format/content structure of the diagnostic trouble trees.

(iv) Manufacturers can satisfy the requirement of paragraph (f)(13)(iii) of this section by making available diagnostic trouble trees on their Web sites in full text.

(14) *Availability of manufacturer-specific scan tools.* Manufacturers shall make available for sale to the persons specified in paragraph (f)(2)(i) of this section their own manufacturer-specific diagnostic tools at a fair and reasonable cost. These tools shall also be made available in a timely fashion either through the manufacturer Web site or through a manufacturer-designated intermediary. Manufacturers who develop different versions of one or more of their diagnostic tools that are used in whole or in part for emission-related diagnosis and repair shall insure that all emission-related diagnosis and repair information is available for sale to the aftermarket at a fair and reasonable cost. Manufacturers shall provide technical support to aftermarket service providers for the tools described in this section, either themselves or through a third party of its choice. Factors for determining fair and reasonable cost include, but are not limited to:

(i) The net cost to the manufacturer's franchised dealerships for similar tools obtained from manufacturers, less any discounts, rebates, or other incentive programs;

(ii) The cost to the manufacturer for preparing and distributing the tools, excluding any research and development costs;

(iii) The price charged by other manufacturers of similar sizes for similar tools;

(iv) The capabilities and functionality of the manufacturer tool;

(v) The means by which the tools are distributed;

(vi) Inflation;

(vii) The ability of aftermarket technicians and shops to afford the tools.

(15) *Changing content of manufacturer-specific scan tools.* Manufacturers who opt to remove non-emissions related content from their manufacturer-specific scan tools and sell them to the persons specified in paragraph (f)(2)(i) of this section shall adjust the cost of the tool accordingly lower to reflect the decreased value of the scan tool. All emissions-related content that remains in the manufacturer-specific tool shall be identical to the information that is contained in the complete version of the manufacturer specific

tool. Any manufacturer who wishes to implement this option must request approval from the Administrator prior to the introduction of the tool into commerce.

(16) *Special tools.* (i) Manufacturers who have developed special tools to extinguish the malfunction indicator light (MIL) for Model Years 1994 through 2003 shall make available the necessary information to equipment and tool companies to design a comparable generic tool.

(ii) Manufacturers are prohibited from requiring special tools to extinguish the malfunction indicator light (MIL) beginning with Model Year 2004.

(17) *Reference materials.* Manufacturers shall conform with the following Society of Automotive Engineers (SAE) standards.

(i) For Web-based delivery of service information, manufacturers shall comply with SAE Recommended Practice J1930 (Revised, May 1998), "Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms" (Incorporated by reference, see § 86.1). This recommended practice standardizes various terms, abbreviations, and acronyms associated with on-board diagnostics. Manufacturers shall comply with SAE J1930 (Incorporated by reference, see § 86.1) beginning with Model Year 2004.

(ii) For identification and scaling information necessary to interpret and understand data available to a generic scan tool through "mode 6", manufacturers shall comply with SAE Recommended Practice J1979 (Revised, September, 1997), "EE Diagnostic Test Modes" (Incorporated by reference, see § 86.1). This recommended practice describes the implementation of the diagnostic test modes for emissions-related test data. Manufacturers shall comply with SAE J1979 beginning with Model Year 2004.

(iii) For allowing ECU and equipment and tool manufacturers to satisfy the needs of multiple end users with minimum modification to a basic ECU design, manufacturers shall comply with SAE Recommended Practice J2284-3 (May, 2001), "High Speed CAN (HSC) for Vehicle Applications at 500 KBPS" (Incorporated by reference, see § 86.1). SAE

J2284-3 establishes standard ECU physical layer, data link layer, and media design criteria. Manufacturers may comply with SAE J2284-3 beginning with model year 2003 and shall comply with SAE J2284-3 beginning with model year 2008.

(iv) For pass-through reprogramming capabilities, manufacturers shall comply with SAE Recommended Practice J2534 (February, 2002), "Recommended Practice for Pass-Thru Vehicle Programming" (Incorporated by reference, see § 86.1). This recommended practice provides technical specifications and information that manufacturers must supply to equipment and tool companies to develop aftermarket pass-through reprogramming tools. Manufacturers shall comply with SAE J2534 beginning with model year 2004.

(18) *Reporting requirements.* Manufacturers shall provide to the Administrator reports on an annual basis within 30 days of the end of the calendar year and upon request of the Administrator, that describe the performance of their individual Web sites. These annual reports shall be submitted to the Administrator electronically utilizing non-proprietary software in the format as agreed to by the Administrator and the manufacturers. Manufacturers may request Administrator approval to report on parameters other than those described below if the manufacturer can demonstrate that those alternate parameters will provide sufficient and similar information for the Administrator to effectively evaluate the manufacturer Web site. These annual reports shall include, at a minimum, monthly measurements of the following parameters:

(i) Total successful requests (measured in number of files including graphic interchange formats (GIFs) and joint photographic expert group (JPEG) images, i.e. electronic images such as wiring or other diagrams or pictures). This is defined as the total successful request counts of all the files which have been requested, including pages, graphics, etc.

(ii) Total failed requests (measured in number of files). This is defined as the total failed request counts of all the files which were requested but failed because they could not be found

or were read-protected. This includes pages, graphics, etc.

(iii) Average data transferred per day (measured by bytes). This is defined as average amount of data transferred per day from one place to another.

(iv) Daily Summary (measured in number of files/pages by day of week). This is defined as the total number of requests each day of the week, over the time period given at the beginning of the report.

(v) Daily report (measured in number of files/pages by the day of the month). This is defined as how many requests there were in each day of a specific month.

(vi) Browser Summary (measured in number of files/pages by browser type, i.e., Netscape, Internet Explorer). This is defined as the versions of a browser by vendor.

(vii) Any other information deemed necessary by the Administrator to determine the adequacy of a manufacturer Web site.

(19) *Prohibited Acts, Liability and Remedies.* (i) It is a prohibited act for any person to fail to promptly provide or cause a failure to promptly provide information as required by this paragraph (f), or to otherwise fail to comply or cause a failure to comply with any provision of this paragraph (f).

(ii) Any person who fails or causes the failure to comply with any provision of this paragraph (f) is liable for a violation of that provision. A corporation is presumed liable for any violations of this subpart that are committed by any of its subsidiaries, affiliates or parents that are substantially owned by it or substantially under its control.

(iii) Any person who violates a provision of this paragraph (f) shall be subject to a civil penalty of not more than \$32,500 per day for each violation. This maximum penalty is shown for calendar year 2004. Maximum penalty limits for later years may be set higher based on the Consumer Price Index, as specified in 40 CFR part 19. In addition, such person shall be liable for all other remedies set forth in Title II of the Clean Air Act, remedies pertaining to provisions of Title II of the Clean Air Act, or other applicable provisions of law.

(g) Through model year 2013, the manufacturer shall furnish or cause to be furnished to the purchaser the following statement for each new diesel-fueled Tier 2 vehicle (certified using a test fuel with 15 ppm sulfur or less): “This vehicle must be operated only with ultra low sulfur diesel fuel (that is, diesel fuel meeting EPA specifications for highway diesel fuel, including a 15 ppm sulfur cap).”

[64 FR 23925, May 4, 1999, as amended at 68 FR 38455, June 27, 2003; 70 FR 40442, July 13, 2005; 79 FR 23711, Apr. 28, 2014]

§ 86.1809-01 Prohibition of defeat devices.

(a) No new light-duty vehicle, light-duty truck, or complete heavy-duty vehicle shall be equipped with a defeat device.

(b) The Administrator may test or require testing on any vehicle at a designated location, using driving cycles and conditions which may reasonably be expected to be encountered in normal operation and use, for the purposes of investigating a potential defeat device.

(c) For cold temperature CO emission control, the Administrator will use a guideline to determine the appropriateness of the CO emission control at ambient temperatures between 25 deg. F (−4 deg. C) and 68 deg. F (20 deg. C). The guideline for CO emission congruity across the intermediate temperature range is the linear interpolation between the CO standard applicable at 25 deg. F (−4 deg. C) and the CO standard applicable at 68 deg. F (20 deg. C). For vehicles that exceed this CO emissions guideline upon intermediate temperature cold testing:

(1) If the CO emission level is greater than the 20 deg. F (−7 deg. C) emission standard, the vehicle will automatically be considered to be equipped with a defeat device without further investigation.

(2) If the CO emission level does not exceed the 20 deg. F emission standard, the Administrator may investigate the vehicle design for the presence of a defeat device under paragraph (d) of this section.

(d) For vehicle designs designated by the Administrator to be investigated for possible defeat devices:

(1) The manufacturer must show to the satisfaction of the Administrator that the vehicle design does not incorporate strategies that unnecessarily reduce emission control effectiveness exhibited during the Federal or Supplemental Federal emissions test procedures (FTP or SFTP) when the vehicle is operated under conditions which may reasonably be expected to be encountered in normal operation and use.

(2) Information requirements:

(i) Upon request by the Administrator, the manufacturer will provide an explanation containing detailed information regarding test programs, engineering evaluations, design specifications, calibrations, on-board computer algorithms, and design strategies incorporated for operation both during and outside of the Federal emission test procedure.

(ii) For purposes of investigations of possible cold temperature CO defeat devices under this paragraph (d), the manufacturer shall provide an explanation which must show, to the satisfaction of the Administrator, that CO emissions are reasonably controlled in reference to the linear guideline, across the intermediate temperature range.

(e) For each test group of Tier 2 LDV/LLDTs and HLDT/MDPVs and interim non-Tier 2 LDV/LLDTs and HLDT/MDPVs the manufacturer must submit, with the Part II certification application, an engineering evaluation demonstrating to the satisfaction of the Administrator that a discontinuity in emissions of non-methane organic gases, carbon monoxide, oxides of nitrogen and formaldehyde measured on the Federal Test Procedure (subpart B of this part) does not occur in the temperature range of 20 to 86 degrees F. For diesel vehicles, the engineering evaluation must also include particulate emissions.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6853, Feb. 10, 2000; 65 FR 59969, Oct. 6, 2000]

§ 86.1809-10 Prohibition of defeat devices.

(a) No new light-duty vehicle, light-duty truck, medium-duty passenger vehicle, or complete heavy-duty vehicle shall be equipped with a defeat device.

(b) The Administrator may test or require testing on any vehicle at a designated location, using driving cycles and conditions that may reasonably be expected to be encountered in normal operation and use, for the purposes of investigating a potential defeat device.

(c) For cold temperature CO and cold temperature NMHC emission control, the Administrator will use a guideline to determine the appropriateness of the CO and NMHC emission control at ambient temperatures between 25°F (the upper bound of the temperature test range) and 68°F (the lower bound of the FTP range). The guideline for CO emission congruity across the intermediate temperature range is the linear interpolation between the CO standard applicable at 25°F and the CO standard applicable at 68°F. The guideline for NMHC emission congruity across the intermediate temperature range is the linear interpolation between the NMHC FEL pass limit (e.g. 0.3499 g/mi for a 0.3 g/mi FEL) applicable at 20°F and the Tier 2 NMOG standard to which the vehicle was certified at 68°F, where the intermediate temperature NMHC level is rounded to the nearest hundredth for comparison to the interpolated line. For vehicles that exceed this CO emissions guideline or this NMHC emissions guideline upon intermediate temperature cold testing:

(1) If the CO emission level is greater than the 20°F emission standard, the vehicle will automatically be considered to be equipped with a defeat device without further investigation. If the intermediate temperature NMHC emission level, rounded to the nearest hundredth, is greater than the 20°F FEL pass limit, the vehicle will be presumed to have a defeat device unless the manufacturer provides evidence to EPA's satisfaction that the cause of the test result in question is not due to a defeat device.

(2) If the CO emission level does not exceed the 20°F emission standard, the Administrator may investigate the vehicle design for the presence of a defeat device under paragraph (d) of this section. If the intermediate temperature NMHC emission level, rounded to the nearest hundredth, does not exceed the 20°F FEL pass limit the Administrator may investigate the vehicle design for

the presence of a defeat device under paragraph (d) of this section.

(d) The following provisions apply for vehicle designs designated by the Administrator to be investigated for possible defeat devices:

(1) The manufacturer must show to the satisfaction of the Administrator that the vehicle design does not incorporate strategies that unnecessarily reduce emission control effectiveness exhibited during the Federal Test Procedure or Supplemental Federal Test Procedure (FTP or SFTP) when the vehicle is operated under conditions that may reasonably be expected to be encountered in normal operation and use.

(2) The following information requirements apply:

(i) Upon request by the Administrator, the manufacturer must provide an explanation containing detailed information regarding test programs, engineering evaluations, design specifications, calibrations, on-board computer algorithms, and design strategies incorporated for operation both during and outside of the Federal emission test procedure.

(ii) For purposes of investigations of possible cold temperature CO or cold temperature NMHC defeat devices under this paragraph (d), the manufacturer must provide an explanation to show, to the satisfaction of the Administrator, that CO emissions and NMHC emissions are reasonably controlled in reference to the linear guideline across the intermediate temperature range.

(e) For each test group of Tier 2 LDV/LLDTs and HLDT/MDPVs and interim non-Tier 2 LDV/LLDTs and HLDT/MDPVs the manufacturer must submit, with the Part II certification application, an engineering evaluation demonstrating to the satisfaction of the Administrator that a discontinuity in emissions of non-methane organic gases, carbon monoxide, oxides of nitrogen and formaldehyde measured on the Federal Test Procedure (subpart B of this part) does not occur in the temperature range of 20 to 86 °F. For diesel vehicles, the engineering evaluation must also include particulate emissions.

[72 FR 8561, Feb. 26, 2007]

§ 86.1809-12 Prohibition of defeat devices.

(a) No new light-duty vehicle, light-duty truck, medium-duty passenger vehicle, or complete heavy-duty vehicle shall be equipped with a defeat device.

(b) The Administrator may test or require testing on any vehicle at a designated location, using driving cycles and conditions that may reasonably be expected to be encountered in normal operation and use, for the purposes of investigating a potential defeat device.

(c) For cold temperature CO and cold temperature NMHC emission control, the Administrator will use a guideline to determine the appropriateness of the CO and NMHC emission control at ambient temperatures between 25°F (the upper bound of the FTP test temperature range) and 68°F (the lower bound of the FTP test temperature range). The guideline for CO emission congruity across the intermediate temperature range is the linear interpolation between the CO standard applicable at 25°F and the CO standard applicable at 68°F. The guideline for NMHC emission congruity across the intermediate temperature range is the linear interpolation between the NMHC FEL pass limit (e.g., 0.3499 g/mi for a 0.3 g/mi FEL) applicable at 20°F and the Tier 2 NMOG standard or the Tier 3 NMOG+NO_x bin standard to which the vehicle was certified at 68°F, where the intermediate temperature NMHC level is rounded to the nearest hundredth for comparison to the interpolated line. For vehicles that exceed this CO emissions guideline or this NMHC emissions guideline upon intermediate temperature testing:

(1) If the CO emission level is greater than the 20 °F emission standard, the vehicle will automatically be considered to be equipped with a defeat device without further investigation. If the intermediate temperature NMHC emission level, rounded to the nearest hundredth, is greater than the 20 °F FEL pass limit, the vehicle will be presumed to have a defeat device unless the manufacturer provides evidence to EPA's satisfaction that the cause of the test result in question is not due to a defeat device.

(2) If the CO emission level does not exceed the 20°F emission standard, the

Administrator may investigate the vehicle design for the presence of a defeat device under paragraph (d) of this section. If the intermediate temperature NMHC emission level, rounded to the nearest hundredth, does not exceed the 20°F FEL pass limit the Administrator may investigate the vehicle design for the presence of a defeat device under paragraph (d) of this section.

(d) The following provisions apply for vehicle designs designated by the Administrator to be investigated for possible defeat devices:

(1) The manufacturer must show to the satisfaction of the Administrator that the vehicle design does not incorporate strategies that unnecessarily reduce emission control effectiveness exhibited during the Federal Test Procedure or Supplemental Federal Test Procedure (FTP or SFTP) or the Highway Fuel Economy Test Procedure (described in subpart B of 40 CFR part 600), or the Air Conditioning Idle Test (described in § 86.165-12), when the vehicle is operated under conditions that may reasonably be expected to be encountered in normal operation and use.

(2) The following information requirements apply:

(i) Upon request by the Administrator, the manufacturer must provide an explanation containing detailed information regarding test programs, engineering evaluations, design specifications, calibrations, on-board computer algorithms, and design strategies incorporated for operation both during and outside of the Federal emission test procedures.

(ii) For purposes of investigations of possible cold temperature CO or cold temperature NMHC defeat devices under this paragraph (d), the manufacturer must provide an explanation to show, to the satisfaction of the Administrator, that CO emissions and NMHC emissions are reasonably controlled in reference to the linear guideline across the intermediate temperature range.

(e) For each test group the manufacturer must submit, with the Part II certification application, an engineering evaluation demonstrating to the satisfaction of the Administrator that a discontinuity in emissions of non-

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methane organic gases, carbon monoxide, carbon dioxide, oxides of nitrogen, nitrous oxide, methane, and formaldehyde measured on the Federal Test Procedure (subpart B of this part) and on the Highway Fuel Economy Test Procedure (subpart B of 40 CFR part 600) does not occur in the temperature range of 20 to 86°F. For diesel vehicles, the engineering evaluation must also include particulate emissions.

[75 FR 25685, May 7, 2010, as amended at 79 FR 23712, Apr. 28, 2014]

§ 86.1810-01 General standards; increase in emissions; unsafe conditions; waivers.

This section applies to model year 2001 and later light-duty vehicles and light-duty trucks fueled by gasoline, diesel, methanol, natural gas and liquefied petroleum gas fuels. This section also applies to MDPVs and complete heavy-duty vehicles certified according to the provisions of this subpart. Multi-fueled vehicles (including dual-fueled and flexible-fueled vehicles) shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of flexible fueled vehicles). The standards of this subpart apply to both certification and in-use vehicles unless otherwise indicated. For Tier 2 and interim non-Tier 2 vehicles, this section also applies to hybrid electric vehicles and zero emission vehicles. Unless otherwise specified, requirements and provisions of this subpart applicable to methanol fueled vehicles are also applicable to Tier 2 and interim non-Tier 2 ethanol fueled vehicles.

(a) Any device, system or element of design installed on or incorporated in a new motor vehicle to enable such vehicle to conform to the standards imposed by this subpart:

(1) Shall not in its operation or function cause the emission into the ambient air of any noxious or toxic substance that would not be emitted in the operation of such vehicle without such system, except as specifically permitted by regulation; and

(2) Shall not in its operation, function or malfunction result in any unsafe condition endangering the vehicle, its occupants, or persons or property in close proximity to the vehicle.

(b) In establishing the physically adjustable range of each adjustable parameter on a new motor vehicle, the manufacturer shall ensure that, taking into consideration the production tolerances, safe vehicle drive ability characteristics are available within that range, as required by section 202(a)(4) of the Clean Air Act.

(c) Every manufacturer of new motor vehicles subject to any of the standards imposed by this subpart shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicles (or motor vehicle engines) in accordance with good engineering judgment to ascertain that such test vehicles will meet the requirements of this section for the useful life of the vehicle.

(d) *Crankcase emissions prohibited.* No crankcase emissions shall be discharged into the ambient atmosphere from any 2001 and later model year light-duty vehicle, light-duty truck, or complete heavy-duty vehicle certified according to the provisions of this subpart.

(e) *On-board diagnostics.* All light-duty vehicles, light-duty trucks and complete heavy-duty vehicles must have an on-board diagnostic system as described in § 86.1806-01 or § 86.1806-04, as applicable.

(f) *Altitude requirements.* Unless otherwise specified, emission standards apply at low-altitude conditions and at high-altitude conditions. The following exceptions apply:

(1) The supplemental exhaust emission standards as described in § 86.1811-04(f) apply only at low-altitude conditions;

(2) The cold temperature NMHC emission standards as described in § 86.1811-10(g) apply only at low-altitude conditions;

(3) The evaporative emission standards specified in § 86.1811-09(e) apply at low-altitude conditions. The evaporative emission standards specified in § 86.1811-04(e) continue to apply at high-altitude conditions for 2009 and later model year vehicles.

(g) The standards set forth in this part refer to test procedures set forth in subparts B, C, O and P of this part.

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(h) For methanol-fueled and natural gas-fueled vehicles, hydrocarbon standards refer to hydrocarbon equivalents and nonmethane hydrocarbon standards refer to nonmethane hydrocarbon equivalents.

(i) *Supplemental FTP general provisions.* (1) Implementation schedules. A minimum of the percentage of a manufacturer's model year sales of light-duty vehicles or light light-duty trucks (considered independently) shown in Table S01-1 and heavy light-duty trucks shown in Table S01-2 shall not exceed the applicable SFTP standards found in paragraph (b) of §§ 86.1811-01, 1812-01, 1813-01, 1814-02, and 1815-02 when tested under the applicable procedures in subpart B of this part. Tables S01-1 and S01-2 follow:

TABLE S01-1—SFTP IMPLEMENTATION SCHEDULE FOR LIGHT-DUTY VEHICLES AND LIGHT LIGHT-DUTY TRUCKS

Model year	Percentage
2000	40
2001	80
2002	100

TABLE S01-2—SFTP IMPLEMENTATION SCHEDULE FOR HEAVY LIGHT-DUTY TRUCKS

Model year	Percentage
2002	40
2003	80
2004	100

(2) Optionally, a minimum of the percentage shown in Table S01-1 of a manufacturer's combined sales of the applicable model year's light-duty vehicles and light light-duty trucks shall not exceed the applicable SFTP standards. Under this option, the light-duty vehicles shall not exceed the applicable SFTP standards in § 86.1811-01(b), and the light light-duty trucks shall not exceed the applicable SFTP standards in § 86.1812-01(b) or § 86.1813-01(b) as applicable.

(3) Sales percentages for the purposes of determining compliance with the applicable SFTP emission standards shall be based on total actual U.S. sales of light-duty vehicles of the applicable model year by a manufacturer to a dealer, distributor, fleet operator, broker, or any other entity which comprises the point of first sale. If the op-

tion of paragraph (i)(2) of this section is taken, such sales percentages shall be based on the total actual combined U.S. sales of light-duty vehicles and light light-duty trucks of the applicable model year by a manufacturer to a dealer, distributor, fleet operator, broker, or any other entity which comprises the point of first sale.

(4) The SFTP standards do not apply to vehicles or trucks certified on alternative fuels, but the standards do apply to the gasoline and diesel fuel operation of flexible fuel vehicles and trucks and dual fuel vehicles and trucks.

(5) The SFTP standards do not apply to vehicles or trucks tested at high altitude.

(6) The air to fuel ratio shall not be richer at any time than the leanest air to fuel mixture required to obtain maximum torque (lean best torque), plus a tolerance of six percent. The Administrator may approve a manufacturer's request for additional enrichment if it can be shown that additional enrichment is needed to protect the engine or emissions control hardware. For Tier 2 and interim non-Tier 2 vehicles, this provision does not apply to enrichment that occurs upon cold start, warm-up conditions and rapid-throttle motion conditions ("tip-in" or "tip-out" conditions).

(7) The requirement to use a single roll dynamometer (or a dynamometer which produces equivalent results), discussed in §§ 86.108-00, 86.118-00, and 86.129-00 of subpart B of this part, applies to all SFTP and FTP test elements as set forth in subpart B of this part for test groups which are designated as SFTP compliant under the implementation schedules in Tables S01-1 and S01-2 in paragraph (i)(1) of this section.

(8) Small volume provisions. (i) Light-duty vehicles and light light-duty trucks manufactured by small volume manufacturers, as described in § 86.1801-01(d), are exempt from the requirements of this paragraph until model year 2002, when 100 percent compliance with the provisions of this paragraph (i) and the SFTP standards in §§ 86.1811-01(b) and 86.1812-01(b) is required. This exemption does not apply

to small volume test groups as defined in § 86.1838-01(b)(2).

(ii) Heavy light-duty trucks manufactured by small volume manufacturers, as defined in § 86.1801-01, are exempt from the requirements of this paragraph (i) until model year 2004 when 100 percent compliance with the provisions of this paragraph and the SFTP standards in §§ 86.1814-02(b) and 86.1815-02(b) is required. This exemption does not apply to small volume test groups as defined in § 86.1838-01(b)(2).

(9) [Reserved]

(10) The manufacturer must state at the time of Application for Certification, based on projected U.S. sales or projected production for U.S. sale, which test groups will be used to attain the required implementation schedule sales percentages for certification purposes.

(11) A manufacturer cannot use one set of test groups to meet its intermediate useful life standards and another to meet its full useful life standards. The same test groups which are used to meet the intermediate useful life standards will be required to meet the corresponding full useful life standards.

(12) Compliance with composite standards shall be demonstrated using the calculations set forth in § 86.164-00.

(13) *A/C-on specific calibrations.* (i) For Tier 2 and interim non-Tier 2 vehicles, A/C-on specific calibrations (e.g. air to fuel ratio, spark timing, and exhaust gas recirculation), may be used which differ from A/C-off calibrations for given engine operating conditions (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters).

(ii) Such calibrations must not unnecessarily reduce the NMHC+NO_x emission control effectiveness during A/C-on operation when the vehicle is operated under conditions which may reasonably be expected to be encountered during normal operation and use.

(iii) If reductions in control system NMHC+NO_x effectiveness do occur as a result of such calibrations, the manufacturer must, in the Application for Certification, specify the circumstances under which such reductions do occur, and the reason for the use of such calibrations resulting in

such reductions in control system effectiveness.

(iv) A/C-on specific “open-loop” or “commanded enrichment” air-fuel enrichment strategies (as defined below), which differ from A/C-off “open-loop” or “commanded enrichment” air-fuel enrichment strategies, may not be used, with the following exceptions: Cold-start and warm-up conditions, or, subject to Administrator approval, conditions requiring the protection of the vehicle, occupants, engine, or emission control hardware. Other than these exceptions, such strategies which are invoked based on manifold pressure, engine speed, throttle position, or other engine parameters must use the same engine parameter criteria for the invoking of this air-fuel enrichment strategy and the same degree of enrichment regardless of whether the A/C is on or off. “Open-loop” or “commanded” air-fuel enrichment strategy is defined as enrichment of the air to fuel ratio beyond stoichiometry for the purposes of increasing engine power output and the protection of engine or emissions control hardware. However, “closed-loop biasing,” defined as small changes in the air-fuel ratio for the purposes of optimizing vehicle emissions or driveability, must not be considered an “open-loop” or “commanded” air-fuel enrichment strategy. In addition, “transient” air-fuel enrichment strategy (or “tip-in” and “tip-out” enrichment), defined as the temporary use of an air-fuel ratio rich of stoichiometry at the beginning or duration of rapid throttle motion, must not be considered an “open-loop” or “commanded” air-fuel enrichment strategy.

(14) *“Lean-on-cruise” calibration strategies.* (i) For Tier 2 and interim non-Tier 2 vehicles, the manufacturer must state in the Application for Certification whether any “lean-on-cruise” strategies are incorporated into the vehicle design. A “lean-on-cruise” air-fuel calibration strategy is defined as the use of an air-fuel ratio significantly greater than stoichiometry, during non-deceleration conditions at speeds above 40 mph. “Lean-on-cruise” air-fuel calibration strategies must not be employed during vehicle operation in normal driving conditions, including

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A/C usage, unless at least one of the following conditions is met:

(A) Such strategies are substantially employed during the FTP or SFTP;

(B) Such strategies are demonstrated not to significantly reduce vehicle NMHC+NO_x emission control effectiveness over the operating conditions in which they are employed; or

(C) Such strategies are demonstrated to be necessary to protect the vehicle occupants, engine, or emission control hardware.

(ii) If the manufacturer proposes to use a "lean-on-cruise" calibration strategy, the manufacturer must specify the circumstances under which such a calibration would be used, and the reason or reasons for the proposed use of such a calibration.

(j) *Evaporative emissions general provisions.* (1) The evaporative standards in §§ 86.1811-01(d), 86.1811-04(e), 86.1812-01(d), 86.1813-01(d), 86.1814-01(d), 86.1814-02(d), 86.1815-01(d), 1815-02(d) and 86.1816-04(d) apply equally to certification and in-use vehicles and trucks. The spitback standard also applies to newly assembled vehicles.

(2) For certification testing only, manufacturers may conduct testing to quantify a level of non-fuel background emissions for an individual test vehicle. Such a demonstration must include a description of the source(s) of emissions and an estimated decay rate. The demonstrated level of non-fuel background emissions may be subtracted from evaporative emission test results from certification vehicles if approved in advance by the Administrator.

(3) All fuel vapor generated in a gasoline- or methanol-fueled light-duty vehicle, light-duty truck, or complete heavy-duty vehicle during in-use operation shall be routed exclusively to the evaporative control system (e.g., either canister or engine purge.) The only exception to this requirement shall be for emergencies.

(4) For certification purposes, where the applicable California evaporative emission standard is as stringent or more stringent than the applicable federal evaporative emission standard, the Administrator may accept California certification test data indicating compliance with the California standard to

demonstrate compliance with the appropriate federal certification evaporative emission standard. The Administrator may require the manufacturer to provide comparative test data which clearly demonstrates that a vehicle meeting the California evaporative standard (when tested under California test conditions/test procedures) will also meet the appropriate federal evaporative emission standard when tested under federal test conditions/test procedures described in this part 86.

(k) *Refueling emissions general provisions—(1) Implementation schedules.* (i) Tables S01-3, S01-4, and S01-5 in this paragraph (k)(1)(i) give the minimum percentage of a manufacturer's sales of the applicable model year's gasoline- and methanol-fueled Otto-cycle and petroleum-fueled and methanol-fueled diesel-cycle light-duty vehicles, light-duty trucks and complete heavy-duty vehicles which shall be tested under the applicable procedures in subpart B of this part, and shall not exceed the standards described in §§ 86.1811-01(e), 86.1811-04(e)(3), 86.1812-01(e), 86.1813-01(e), and 86.1816-04(e). Vehicles waived from the emission standards under the provisions of paragraphs (m) and (n) of this section shall not be counted in the calculation of the percentage of compliance. Either manufacturer sales or actual production intended for sale in the United States may be used to determine combined volume, at the manufacturer's option. Tables S01-3, S01-4, and S01-5 follow:

TABLE S01-3—LIGHT-DUTY VEHICLES

Model year	Percentage
1998 ^a	40
1999 ^a	80
2000 ^a	100

^aNOTE: This subpart prescribes standards for 2001 and later MY vehicles. However, the implementation phase-in periods prior to this date are included for ease of reference.

TABLE S01-4—LIGHT LIGHT-DUTY TRUCKS

Model year	Percentage
2001	40
2002	80
2003	100

TABLE S01-5—HEAVY LIGHT-DUTY TRUCKS

Model year	Percentage
2004	40

TABLE S01-5—HEAVY LIGHT-DUTY TRUCKS—
Continued

Model year	Percentage
2005	80
2006	100

(ii) Either manufacturer sales or actual production intended for sale in the United States may be used to determine combined volume, at the manufacturers option.

(2) *Determining sales percentages.* Sales percentages for the purposes of determining compliance with the applicable refueling emission standards light-duty vehicles, light-duty trucks, medium-duty passenger vehicles, and complete heavy-duty vehicles shall be based on total actual U.S. sales of heavy light-duty trucks and complete heavy-duty vehicles of the applicable model year by a manufacturer to a dealer, distributor, fleet operator, broker, or any other entity which comprises the point of first sale.

(3) *Refueling receptacle requirements.* Compressed natural gas vehicles must meet the requirements for fueling connection devices as specified in § 86.1813-17(f)(1).

(1) *Fuel dispensing spitback testing waiver.* (1) Vehicles certified to the refueling emission standards set forth in §§ 86.1811-04(e), 86.1812-01(e), 86.1813-01(e), 86.1816-05(e) are not required to demonstrate compliance with the fuel dispensing spitback standard contained in that section provided that:

(i) The manufacturer certifies that the vehicle inherently meets the fuel dispensing spitback standard as part of compliance with the refueling emission standard; and

(ii) This certification is provided in writing and applies to the full useful life of the vehicle.

(2) EPA retains the authority to require testing to enforce compliance and to prevent noncompliance with the fuel dispensing spitback standard.

(m) [Reserved]

(n) *Fixed liquid level gauge waiver.* Liquefied petroleum gas-fueled vehicles which contain fixed liquid level gauges or other gauges or valves which can be opened to release fuel or fuel vapor during refueling, and which are being tested for refueling emissions, are not

required to be tested with such gauges or valves open, as outlined in § 86.157-98(d)(2), provided the manufacturer can demonstrate, to the satisfaction of the Administrator, that such gauges or valves would not be opened during refueling in-use due to inaccessibility or other design features that would prevent or make it very unlikely that such gauges or valves could be opened.

(o) *NMOG measurement procedures.* Measure NMOG emissions using the procedures described in 40 CFR 1065.635.

(p) For Tier 2 and interim non-Tier 2 vehicles fueled by gasoline, diesel, natural gas, liquefied petroleum gas, or hydrogen, manufacturers may measure non-methane hydrocarbons (NMHC) in lieu of NMOG. Manufacturers must multiply NMHC measurements from gasoline vehicles by an adjustment factor of 1.04 before comparing with the NMOG standard to determine compliance with that standard. For vehicles fuel by natural gas, liquefied petroleum gas, hydrogen manufacturers must propose an adjustment factor to adjust NMHC results to properly represent NMOG results. Such factors must be based upon comparative testing of NMOG and NMHC emissions and be approved in advance by the Administrator.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6853, Feb. 10, 2000; 65 FR 59969, Oct. 6, 2000; 66 FR 5190, Jan. 18, 2001; 66 FR 19309, Apr. 13, 2001; 70 FR 72928, Dec. 8, 2005; 76 FR 19874, Apr. 8, 2011; 79 FR 23712, Apr. 28, 2014]

§ 86.1810-09 General standards; increase in emissions; unsafe condition; waivers.

Section 86.1810-09 includes text that specifies requirements that differ from § 86.1810-01. Where a paragraph in § 86.1810-01 is identical and applicable to § 86.1810-09, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.1810-01.” Where a corresponding paragraph of § 86.1810-01 is not applicable, this is indicated by the statement “[Reserved].” This section applies to model year 2009 and later light-duty vehicles and light-duty trucks fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels. This section also applies to MDPVs and complete heavy-

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duty vehicles certified according to the provisions of this subpart. Multi-fueled vehicles (including dual-fueled and flexible-fueled vehicles) must comply with all requirements established for each consumed fuel (or blend of fuels in the case of flexible fueled vehicles). The standards of this subpart apply to both certification and in-use vehicles unless otherwise indicated. This section also applies to hybrid electric vehicles and zero emission vehicles. Unless otherwise specified, requirements and provisions of this subpart applicable to methanol fueled vehicles are also applicable to Tier 2 and interim non-Tier 2 ethanol fueled vehicles.

(a) through (e) [Reserved] For guidance see § 86.1810-01.

(f) *Altitude requirements.* (1) All emission standards apply at low altitude conditions and at high altitude conditions, with the following exceptions:

(i) The supplemental exhaust emission standards as described in § 86.1811-04(f) apply only at low altitude conditions;

(ii) The cold temperature NMHC emission standards as described in § 86.1811-10(g) apply only at low altitude conditions;

(iii) The evaporative emission standards specified in § 86.1811-09(e) apply at low altitude conditions. The evaporative emission standards specified in § 86.1811-04(e) continue to apply at high altitude conditions for 2009 and later model year vehicles.

(2) For vehicles that comply with the cold temperature NMHC standards described in § 86.1811-10(g) and the CO₂, N₂O, and CH₄ exhaust emission standards described in § 86.1818-12, manufacturers must submit an engineering evaluation indicating that common calibration approaches are utilized at high altitudes (except when there are specific high altitude calibration needs to deviate from low altitude emission control practices). Any deviation from low altitude emission control practices must be included in the auxiliary emission control device (AECD) descriptions submitted at certification. Any AECD specific to high altitude must require engineering emission data for EPA evaluation to quantify any emission impact and validity of the AECD.

(g) through (p) [Reserved] For guidance see § 86.1810-01.

[72 FR 8562, Feb. 26, 2007, as amended at 75 FR 25686, May 7, 2010; 76 FR 39521, July 6, 2011; 77 FR 63156, Oct. 15, 2012]

§ 86.1810-17 General requirements.

The following provisions apply to all vehicles certified under this subpart:

(a) Any device, system or element of design installed on or incorporated in a new motor vehicle to enable such vehicle to conform to the standards imposed by this subpart:

(1) Shall not in its operation or function cause the emission into the ambient air of any noxious or toxic substance that would not be emitted in the operation of such vehicle without such system, except as specifically permitted by regulation; and

(2) Shall not in its operation, function or malfunction result in any unsafe condition endangering the vehicle, its occupants, or persons or property in close proximity to the vehicle.

(b) In establishing the physically adjustable range of each adjustable parameter on a new motor vehicle, the manufacturer shall ensure that, taking into consideration the production tolerances, safe vehicle drivability characteristics are available within that range.

(c) Unless otherwise specified, the emission standards of this subpart apply equally for certification and for in-use vehicles throughout the specified useful-life period. Also, manufacturers must use good engineering judgment to determine that all of a vehicle's emission-related components are designed to operate properly throughout the specified useful-life period.

(d) Vehicles may not discharge crankcase emissions into the ambient atmosphere.

(e) All vehicles must have an onboard diagnostic system as described in § 86.1806.

(f) Emission standards apply at low-altitude conditions and at high-altitude conditions, except as noted in this subpart.

(g) The cold temperature CO and NMHC standards in this subpart refer to test procedures set forth in subpart C of this part and 40 CFR part 1066, subpart H. All other emission standards in

this subpart rely on test procedures set forth in subpart B of this part. These procedures rely on the test specifications in 40 CFR parts 1065 and 1066 as described in subparts B and C of this part.

(h) Multi-fueled vehicles (including dual-fueled and flexible-fueled vehicles) must comply with all the requirements established for each consumed fuel (and blend of fuels for flexible-fueled vehicles). The following specific provisions apply for flexible-fueled vehicles that operate on ethanol and gasoline:

(1) For exhaust emissions, we may identify the worst-case fuel blend for testing in addition to what is required for gasoline-fueled vehicles. The worst-case fuel blend may be the fuel specified in 40 CFR 1065.725, or it may consist of a combination of the fuels specified in 40 CFR 1065.710(b) and 1065.725. We may waive testing with the worst-case blended fuel for US06 and/or SC03 duty cycles; if we waive only SC03 testing, substitute the SC03 emission result using the standard test fuel for gasoline-fueled vehicles to calculate composite SFTP emissions.

(2) For refueling emissions, we may identify the worst-case fuel blend for testing in addition to what is required for gasoline-fueled vehicles. The worst-case fuel blend may consist of a combination of the fuels specified in 40 CFR 1065.710(c) and 1065.725. This is generally expected to be a fuel blend with 10 percent ethanol and a nominal Dry Vapor Pressure Equivalent of 10 psi. You may prepare such a worst-case fuel blend by mixing it before dispensing into the vehicle's fuel tank, or by consecutively dispensing appropriate amounts of the two specified fuels into a fuel tank.

(3) No additional spitback or evaporative emission testing is required beyond the emission measurements with the gasoline test fuel specified in 40 CFR 1065.710.

(i) Where we specify requirements based on a percentage of total sales volume in a given model year, you may instead ask us to calculate the percentage based on production volumes instead of sales volumes.

[79 FR 23712, Apr. 28, 2014]

§ 86.1811-04 Emission standards for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles.

(a) *Applicability.* (1) This section contains regulations implementing emission standards for all LDVs, LDTs and MDPVs. This section applies to 2004 and later model year LDVs, LDTs and MDPVs fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels, except as noted. Additionally, this section contains provisions applicable to hybrid electric vehicles (HEVs) and zero emission vehicles (ZEVs). Multi-fueled vehicles must comply with all requirements established for each consumed fuel.

(2) This section also applies to LDVs, LDTs and MDPVs of model years prior to 2004, when manufacturers certify such vehicles to Tier 2 exhaust emission requirements to utilize alternate phase-in schedules, as allowed under paragraph (k)(6) of this section, and/or to earn early NO_x credits for use in complying with the Tier 2 fleet average NO_x standard which takes effect in the 2004 model year for LDV/LLDTs and 2008 for HLDT/MDPVs.

(3) Except where otherwise specified, this section applies instead of §§ 86.1811-01, 86.1812-01, 86.1813-01, 86.1814-01, 86.1814-02, 86.1815-01, and 86.1815-02.

(4) Except where otherwise specified, the provisions of this section apply equally to LDVs and all categories of LDTs, and to all MDPVs. Numerous provisions are applicable equally to HLDTs and MDPVs, as reflected by the term HLDT/MDPV. Numerous provisions apply equally to LDVs and LLDTs as reflected by the term LDV/LLDT.

(5) The exhaust emission standards and evaporative emission standards of this section apply equally to certification and in-use LDVs, LDTs and MDPVs, unless otherwise specified.

(b) *Test weight.* (1) Except as required in paragraphs (b)(2) and (b)(4) of this section, or permitted under paragraph (b)(3) of this section, emission testing of all LDVs, LDTs and MDPVs to determine compliance with any exhaust or evaporative emission standard set forth in this part must be on a loaded

vehicle weight (LVW) basis, as that term is defined in this subpart.

(2) Interim non-Tier 2 HLDTs tested to Tier 1 SFTP standards, must be tested on an adjusted loaded vehicle weight (ALVW) basis, as that term is defined in this subpart, during the SC03 element of the SFTP.

(3) Except as required in paragraphs (b)(2) and (b)(4) of this section, interim non-Tier 2 HLDT/MDPVs may be tested on an ALVW basis or an LVW basis to demonstrate compliance with any exhaust or evaporative emission standard set forth in this part.

(4) MDPVs certified to bin 11 standards from Tables S04-1 and -2 must be tested on an ALVW basis to demonstrate compliance with any exhaust emission standard set forth in this part.

(c) *Tier 2 FTP exhaust emission standards.* Exhaust emissions from Tier 2 vehicles must not exceed the standards in Table S04-1 of this section at full useful life when tested over the Federal Test Procedure (FTP) described in subpart B of this part. Exhaust emissions from Tier 2 vehicles must not exceed the standards in Table S04-2 of this section at intermediate useful life, if applicable, when tested over the FTP.

(1) For a given test group a manufacturer desires to certify to operate only on one fuel, the manufacturer must select a set of standards from the same bin (line or row) in Table S04-1 of this section for non-methane organic gases (NMOG), carbon monoxide (CO), oxides of nitrogen (NO_x), formaldehyde (HCHO) and particulate matter (PM). The manufacturer must certify the test group to meet those standards, subject to all the applicable provisions of this subpart. The manufacturer must also certify the test group to meet the intermediate useful life standards (if any) in Table S04-2 of this section having the same EPA bin reference number as the chosen full useful life standards.

(2) For a given test group of flexible-fueled, bi-fuel or dual fuel vehicles when operated on the alcohol or gaseous fuel they are designed to use, manufacturers must select a bin of standards from Table S04-1 of this section and the corresponding bin in Table S04-2, if any. When these flexible-

fueled, bi-fuel or dual fuel vehicles are certified to operate on gasoline or diesel fuel, the manufacturer may choose to comply with the next numerically higher applicable NMOG standard, if any, above the bin which contains the standards selected for certification on the gaseous or alcohol fuel.

(3)(i) For a given test group of flexible-fueled, bi-fuel or dual fuel vehicles certified to bin 10 in Table S04-1, when operated on the alcohol or gaseous fuel they are designed to use, manufacturers may choose to comply with an NMOG standard of 0.230 for LDV/LLDTs or 0.280 g/mi for HLDT/MDPVs at full useful life and corresponding intermediate life standards of 0.160 g/mi and 0.195 g/mi, respectively, when these flexible-fueled, bi-fuel or dual fuel vehicles are certified to operate on gasoline or diesel fuel.

(ii) For a given test group of flexible-fueled, bi-fuel or dual fuel vehicles certified to bin 8 in Table S04-1, when operated on the alcohol or gaseous fuel they are designed to use, manufacturers may choose to comply with a NMOG standard of 0.156 g/mi for LDV/LLDTs and 0.180 for HLDT/MDPVs at full useful life and corresponding intermediate life standards of 0.125 g/mi and 0.140 g/mi, respectively, when these flexible-fueled, bi-fuel or dual fuel vehicles are certified to operate on gasoline or diesel fuel.

(4)(i) For bins where intermediate life standards are applicable, a manufacturer may elect not to comply with such standards. Except as permitted in paragraph (c)(4)(iv) of this section, the manufacturer must certify such vehicles to a useful life of 15 years or 150,000 miles, whichever occurs first, for LDV/LLDTs and HLDT/MDPVs.

(ii) A manufacturer electing not to comply with intermediate life standards, as permitted in paragraph (c)(4)(i) of this section, may not generate additional NO_x credits as described under § 86.1860-04 (g), except as permitted in paragraph (c)(4)(iii) of this section.

(iii) For bins where intermediate life standards are not applicable, or are specified to be optional by paragraph (c)(4)(iv) of this section, a manufacturer may generate additional NO_x credits subject to the provisions in § 86.1860-04 (g).

(iv) For diesel vehicles certified to bin 9 or bin 10, intermediate life standards are optional regardless of whether the manufacturer certifies the test group to a full useful life of 120,000 miles or 150,000 miles.

(5) In a given model year, an individual vehicle may not be included in both the Tier 2 program and an interim program.

(6) Tables S04-1 and S04-2 follow:

TABLE S04-1—TIER 2 AND INTERIM NON-TIER 2 FULL USEFUL LIFE EXHAUST MASS EMISSION STANDARDS
[Grams per mile]

Bin No.	NO _x	NMOG	CO	HCHO	PM	Notes
11	0.9	0.280	7.3	0.032	0.12	a, c
10	0.6	0.156/0.230	4.2/6.4	0.018/0.027	0.08	a, b, d
9	0.3	0.090/0.180	4.2	0.018	0.06	a, b, e
8	0.20	0.125/0.156	4.2	0.018	0.02	b, f
7	0.15	0.090	4.2	0.018	0.02	
6	0.10	0.090	4.2	0.018	0.01	
5	0.07	0.090	4.2	0.018	0.01	
4	0.04	0.070	2.1	0.011	0.01	
3	0.03	0.055	2.1	0.011	0.01	
2	0.02	0.010	2.1	0.004	0.01	
1	0.00	0.000	0.0	0.000	0.00	

Notes:

^aThis bin and its corresponding intermediate life bin are deleted at end of 2006 model year (end of 2008 model year for HLDTs and MDPVs).

^bHigher NMOG, CO and HCHO values apply for HLDTs and MDPVs only.

^cThis bin is only for MDPVs.

^dOptional NMOG standard of 0.280 g/mi applies for qualifying LDT4s and qualifying MDPVs only.

^eOptional NMOG standard of 0.130 g/mi applies for qualifying LDT2s only.

^fHigher NMOG standard deleted at end of 2008 model year.

TABLE S04-2—TIER 2 AND INTERIM NON-TIER 2 INTERMEDIATE USEFUL LIFE (50,000 MILE) EXHAUST MASS EMISSION STANDARDS (GRAMS PER MILE)

Bin No.	NO _x	NMOG	CO	HCHO	PM	Notes
11	0.6	0.195	5.0	0.022		a c f h
10	0.4	0.125/0.160	3.4/4.4	0.015/0.018		a b d f g h
9	0.2	0.075/0.140	3.4	0.015		a b e f g h
8	0.14	0.100/0.125	3.4	0.015		b f h i
7	0.11	0.075	3.4	0.015		f h
6	0.08	0.075	3.4	0.015		f h
5	0.05	0.075	3.4	0.015		f h

NOTES:

^aThis bin deleted at end of 2006 model year (end of 2008 model year for HLDTs and MDPVs).

^bHigher NMOG, CO and HCHO values apply for HLDTs and MDPVs only.

^cThis bin is only for MDPVs.

^dOptional NMOG standard of 0.195 g/mi applies for qualifying LDT4s and qualifying MDPVs only.

^eOptional NMOG standard of 0.100 g/mi applies for qualifying LDT2s only.

^fThe full useful life PM standards from Table S04-1 also apply at intermediate useful life.

^gIntermediate life standards of this bin are optional for diesels.

^hIntermediate life standards are optional for vehicles certified to a useful life of 150,000 miles.

ⁱHigher NMOG standard deleted at end of 2008 model year.

(d) *Fleet average NO_x Standards.* (1)(i) For a given individual model year's sales of Tier 2 vehicles, including model years during the phase-in years of the Tier 2 standards, manufacturers must comply with a fleet average oxides of nitrogen (NO_x) standard of 0.07 grams per mile. The manufacturer must calculate its fleet average NO_x emission level(s) as described in § 86.1860-04. Up through and including model year 2008, manufacturers must calculate separate fleet average NO_x

emission levels for LDV/LLDTs and for HLDLT/MDPVs as described in § 86.1860-04.

(ii) During a phase-in year, the manufacturer must comply with the 0.07 g/mi fleet average standard for the required phase-in percentage for that year as specified in paragraph (k)(1) of this section, or for the alternate phase-in percentage as permitted under paragraph (k)(6) of this section.

(2) *For Early Tier 2 LDV/LLDTs.* For model years prior to 2004, where the

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manufacturer desires to bank early Tier 2 NO_x credits as permitted under § 86.1861(c), the manufacturer must comply with a fleet average standard of 0.07 grams per mile for its Tier 2 LDV/LLDTs. Manufacturers must determine compliance with the NO_x fleet average standard according to regulations in § 86.1860-04 of this subpart.

(3) *For Early Tier 2 HLD/MDPVs.* For model years prior to 2008, where the manufacturer desires to bank early Tier 2 NO_x credits as permitted under § 86.1861(c), the manufacturer must comply with a fleet average standard of 0.07 grams per mile for its Tier 2 HLD/MDPVs. Manufacturers must determine compliance with the NO_x fleet average standard according to regulations in § 86.1860-04.

(e) *Evaporative emission standards.* Consistent with the phase-in requirements in paragraph (k) of this section, evaporative emissions from gasoline-fueled, natural gas-fueled, liquefied petroleum gas-fueled, ethanol-fueled and methanol-fueled vehicles must not exceed the standards in this paragraph (e). The standards apply equally to certification and in-use vehicles.

(1) *Diurnal-plus-hot soak evaporative hydrocarbon standards.* Hydrocarbons for LDV/LLDTs, HLDs and MDPVs must not exceed the diurnal plus hot soak standards shown in Table S04-3 for the full three diurnal test sequence and for the supplemental two diurnal test sequence. Table S04-3 follows:

TABLE S04-3—LIGHT-DUTY DIURNAL PLUS HOT SOAK EVAPORATIVE EMISSION STANDARDS
[grams per test]

Vehicle category	3 day diurnal+hot soak	Supplemental 2 day diurnal+hot soak
LDV/LLDTs	0.95	1.2
HLDs	1.2	1.5
MDPVs	1.4	1.75

(2) *Running loss standard.* Hydrocarbons for LDVs, LDTs and MDPVs measured on the running loss test must not exceed 0.05 grams per mile.

(3) *Refueling emission standards.* Refueling emissions must not exceed the following standards:

(i) For gasoline-fueled and methanol-fueled LDV, LDT and MDPV: 0.20

grams hydrocarbon per gallon (0.053 grams per liter) of fuel dispensed. This standard also applies for diesel-fueled LDV.

(ii) For liquefied petroleum gas-fueled LDV, LDTs and MDPVs: 0.15 grams hydrocarbon per gallon (0.04 grams per liter) of fuel dispensed.

(iii) Refueling standards for HLDs are subject to the phase-in requirements found in § 86.1810-01(k). MDPVs must also comply with the phase-in requirement in § 86.1810-01(k) and must be grouped with HLDs to determine phase-in compliance.

(4) *Spitback standards.* For gasoline and methanol fueled LDV/Ts and MDPVs, hydrocarbons measured on the fuel dispensing spitback test must not exceed 1.0 grams hydrocarbon (carbon if methanol-fueled) per test.

(5) *Evaporative emission requirements for interim vehicles.* (i) LDV/Ts not certified to meet the evaporative emission standards in this paragraph (e) as permitted under the phase-in schedule of paragraph (k) of this section, must meet applicable evaporative emission standards in § 86.1811-01, § 86.1812-01, § 86.1813-01, § 86.1814-02 or § 86.1815-02 except that all LDV/Ts must meet the refueling emission standards in paragraph (e)(3) of this section.

(ii) MDPVs not certified to meet the evaporative emission standards in this paragraph (e) as permitted under the phase-in schedule of paragraph (k) of this section, must meet applicable evaporative emission standards for heavy-duty vehicles in § 86.099-10.

(6) In cases where applicable California emission standards are as stringent or more stringent than applicable standards specified under this paragraph (e), the Administrator may accept data indicating compliance with California standards to demonstrate compliance for certification purposes with the standards required under this paragraph (e). The Administrator may require manufacturers to provide comparative test data to show that a vehicle meeting California standards under California test conditions and procedures will also meet the standards under this paragraph (e) when tested under test conditions and procedures in this part 86.

(f) *Supplemental exhaust emission standards for LDV/Ts.* (1) Supplemental exhaust emission standards are applicable to gasoline and diesel-fueled LDV/Ts but are not applicable to MDPVs, alternative fueled LDV/Ts, or flexible fueled LDV/Ts when operated on a fuel other than gasoline or diesel. Except as otherwise specified in this

paragraph (f), manufacturers must comply with 4000 mile and full useful life SFTP standards as determined in this paragraph (f). The 4000 mile SFTP standards must be taken from Table S04-4 and the full life SFTP standards must be calculated using the formula in paragraph (f)(2) of this section. Table S04-4 follows:

TABLE S04-4—4000 MILE SFTP STANDARDS FOR TIER 2 AND INTERIM NON-TIER 2 LDVS AND LDTs

	US06		SC03	
	NMHC+NO _x (g/mi)	CO (g/mi)	NMHC+NO _x (g/mi)	CO (g/mi)
LDV/LDT1	0.14	8.0	0.20	2.7
LDT2	0.25	10.5	0.27	3.5
LDT3	0.4	10.5	0.31	3.5
LDT4	0.6	11.8	0.44	4.0

(2)(i) Manufacturers must calculate their applicable full useful life SFTP standards for NMHC+ NO_x, PM and for CO, if using the weighted CO standard. If not using the weighted CO standard, manufacturers may use the full useful life standalone Tier 1 standards for US06 and SC03. To calculate the applicable full useful life weighted NMHC+ NO_x, PM and CO standards, manufacturers must use the following formula:

$$\text{SFTP Standard} = \text{SFTP Standard}_i - [0.35 \times (\text{FTP Standard}_i - \text{Current FTP Standard})]$$

Where:

SFTP Standard = Applicable full life weighted SFTP standard for NMHC+ NO_x, PM

or CO. The NMHC+ NO_x and PM standards must be rounded to two decimal places and the CO standard must be rounded to one decimal place.

SFTP Standard_i = Applicable full life Tier 1 SFTP standard for NMHC+NO_x or CO from Table S04-5. For PM only, use FTP Standard_i for SFTP Standard_i.

FTP Standard_i = Applicable full life Tier 1 FTP standard from Table S04-6 in this paragraph (f). For the Tier 1 NMHC+NO_x standard, add the applicable NMHC and NO_x standards.

Current FTP Standard = Applicable full life FTP standard from Table S04-1 in paragraph (c) of this section. For the current NMHC+NO_x standard, add the NMOG and NO_x standards from the applicable bin.

TABLE S04-5—TIER 1 FULL USEFUL LIFE SFTP STANDARDS

Vehicle category	NMHC + NO _x (weighted g/mi) ^{a c}	CO (g/mi) ^{b c}		
		US06	SC03	Weighted
LDV/LDT1	0.91 (0.65)	11.1 (9.0)	3.7 (3.0)	4.2 (3.4)
LDT2	1.37 (1.02)	14.6 (11.6)	4.9 (3.9)	5.5 (4.4)
LDT3	1.44	16.9	5.6	6.4
LDT4	2.09	19.3	6.4	7.3

^a Weighting for NMHC+NO_x and optional weighting for CO is 0.35x(FTP) +0.28x(US06)+0.37x(SC03).

^b CO standards are stand alone for US06 and SC03 with option for a weighted standard.

^c Intermediate life standards are shown in parentheses for diesel LDV/LLDTs opting to calculate intermediate life SFTP standards in lieu of 4,000 mile SFTP standards as permitted under paragraph (f)(6) of this section.

TABLE S04-6—TIER 1 FULL USEFUL LIFE FTP STANDARDS (G/Mi)

Vehicle category	NMHC ^a	NO _x ^a	CO ^a	PM
LDV/LDT1	0.31 (0.25)	0.6 (0.4)	4.2 (3.4)	0.10
LDT2	0.40 (0.32)	0.97(0.7)	5.5 (4.4)	0.10
LDT3	0.46	0.98	6.4	0.10

TABLE S04-6—TIER 1 FULL USEFUL LIFE FTP STANDARDS (G/M)—Continued

Vehicle category	NMHC ^a	NO _x ^a	CO ^a	PM
LDT4	0.56	1.53	7.3	0.12

^aIntermediate life standards are shown in parentheses for diesel LDV/LLDTs opting to calculate intermediate life SFTP standards in lieu of 4,000 mile SFTP standards as permitted under paragraph (f)(6) of this section.

(ii)(A) Manufacturers must determine compliance with NMHC+NO_x, CO and PM weighted SFTP standards calculated in paragraph (f)(2)(i) of this section by weighting their emission results as follows:

$$0.35 \times (\text{FTP}) + 0.28 \times (\text{US06}) + 0.37 \times (\text{SC03}).$$

(B) The results of the calculation in paragraph (f)(2)(ii)(A) of this section must be rounded to one more decimal place than the applicable standard calculated in paragraph (f)(2)(i) of this section and then compared with that standard.

(3) For interim non-Tier 2 gasoline, diesel and flexible-fueled LDT3s and LDT4s, manufacturers may, alternatively, meet the gasoline-fueled vehicle SFTP standards found in §§ 86.1814-02 and 86.1815-02, respectively.

(4) Interim non-Tier 2 gasoline, diesel and flexible-fueled LDV/LLDTs certified to bin 10 FTP exhaust emission standards from Table S04-1 in paragraph (c) of this section may meet the gasoline Tier 1 SFTP requirements found at §§ 86.1811-01(b), 86.1812-01(b), 86.1813-01(b), for LDVs, LDT1s, and LDT2s, respectively.

(5) SFTP standards for PM are not applicable to interim non-Tier 2 LDV/Ts. For Tier 2 LDV/Ts, the 4000 mile PM standard is equal to the full life PM standard calculated under paragraph (f)(2) of this section. The requirements of this paragraph (f)(5) also apply to Tier 2 flexible fuel vehicles when operated on gasoline or diesel fuel. (See regulations in § 86.1829-01(b)(1)(iii)(B) regarding data submittal for PM results for gasoline vehicles.)

(6)(i) In lieu of complying with 4000 mile SFTP standards described in this paragraph, diesel LDV/LLDTs through model year 2006, may comply instead with intermediate life SFTP standards derived from Tier 1 intermediate life SFTP standards for gasoline vehicles.

(ii) To calculate intermediate life SFTP standards, substitute inter-

mediate life Tier 1 FTP and SFTP values from Tables S04-5 and S04-6 in this paragraph (f), as appropriate, for the full life values in the equation in paragraph (f)(2)(i) of this section. Substitute the applicable intermediate life standards for the full life current FTP standard. If there is no applicable intermediate life standard use the full life current FTP standard.

(iii) A manufacturer of diesel LDV/LLDTs must declare which option it will use (4,000 mile or intermediate life standards) in Part I of its certification application.

(7) For diesel vehicles certified to the bin 9 or bin 10 standards of paragraph (c) of this section, 4000 mile SFTP and intermediate life SFTP standards are optional regardless of whether the manufacturer certifies the test group to a full useful life of 120,000 miles or 150,000 miles.

(8)(i) For model year 2007 through 2009 diesel LDVs and diesel LDT1s only, a manufacturer may optionally comply with the 4000 mile US06 NMHC+NO_x standard shown in Table S04-4 for LDT2s (0.25 g/mile), instead of the standards for LDV/LDT1s (0.14 g/mile). A manufacturer choosing this option also must comply with intermediate life SFTP NMHC+NO_x standards determined using the calculation described under paragraph (f)(6)(ii) of this section. A manufacturer choosing this option must comply with the SFTP NMHC+NO_x standard determined under paragraph (f)(6)(ii) not only at intermediate life but also at full useful life and must certify such vehicles to this SFTP NMHC+NO_x standard for a full useful life of 150,000 miles or 15 years, whichever occurs first.

(ii) In Part I of its certification application for model years 2007 through 2009, a manufacturer of diesel LDV/LLDTs must declare which provision it will use (the base Tier 2 provision of

paragraphs (f)(1) and (f)(2) of this section or the option described in paragraph (f)(8)(i) of this section).

(g) *Cold temperature exhaust emission standards.* These standards are applicable only to gasoline fueled LDV/Ts and MDPVs. For cold temperature exhaust emission standards, a useful life of 50,000 miles applies.

(1) For LDVs and LDT1s, the standard is 10.0 grams per mile CO.

(2) For LDT2s, LDT3s and LDT4s, and MDPVs the standard is 12.5 grams per mile CO.

(3) These standards do not apply to interim non-Tier 2 MDPVs.

(h) [Reserved]

(i) Idle CO standards and references to such standards in this subpart, do not apply to any 2004 or later model year LDV, LDT, or MDPV or to any LDV, LDT or MDPV certified to Tier 2 standards before model year 2004 for purposes of generating early NO_x credits or meeting the requirements of an alternative phase-in schedule that begins prior to the 2004 model year.

(j) *Highway NO_x exhaust emission standard.* The NO_x emissions measured on the federal Highway Fuel Economy Test in 40 CFR part 600, subpart B, must not be greater than 1.33 times the applicable FTP NO_x standard to which the manufacturer certifies the test group. Both the measured emissions and the product of the NO_x standard and 1.33 must be rounded to the nearest 0.01 g/mi before being compared.

(k) *Phase-in of the Tier 2 FTP exhaust and evaporative requirements; small volume manufacturer flexibilities.* (1) Manufacturers must comply with the phase-in requirements in Tables S04-7 and S04-8 of this paragraph (k) for the Tier 2 FTP exhaust emission requirements specified in paragraph (c) of this section. Separate phase-in schedules are provided for LDV/LLDTs and for HLDT/MDPVs. These requirements specify the minimum percentage of the manufacturer's LDV/LLDT and HLDT/MDPV U.S. sales, by model year, that must meet the Tier 2 requirements, including the applicable fleet average standard, for their full useful lives. As the terms LDV/LLDT and HLDT/MDVP imply, LDVs and LLDTs must be grouped together to determine compliance with these phase-in requirements

and HLDTs and MDPVs must also be grouped together to determine compliance with these phase-in requirements. Tables S04-7 and S04-8 follow:

TABLE S04-7—PHASE-IN PERCENTAGES FOR LDV/LLDT TIER 2 REQUIREMENTS

Model year	Percentage of LDV/LLDTs that must meet tier 2 requirements
2004	25
2005	50
2006	75
2007 and subsequent	100

TABLE S04-8—PHASE-IN PERCENTAGES FOR HLDT/MDPV TIER 2 REQUIREMENTS

Model year	Percentage of HLDT/MDPVs that must meet tier 2 requirements
2008	50
2009 and subsequent	100

(2) Manufacturers must also comply with the phase-in requirements in Tables S04-7 and S04-8 of this paragraph (k) for the evaporative emission requirements contained in paragraph (e) of this section.

(3) Manufacturers may opt to use different LDV/LLDTs and HLDT/MDPVs to meet the phase-in requirements for evaporative emissions and FTP exhaust emissions, provided that the manufacturer meets the minimum applicable phase-in requirements in Table S04-7 and Table S04-8 of this paragraph (k) for both FTP exhaust and evaporative emissions. A LDV, LDT or MDPV counted toward compliance with any phase-in requirement for FTP exhaust or evaporative standards, must comply with all applicable Tier 2 exhaust requirements or all applicable evaporative requirements, respectively, described in this section.

(4) LDVs, LDTs and MDPVs not certified to meet the Tier 2 FTP exhaust requirements during model years 2004–2008, as allowed under this subpart, are subject to the provisions of paragraph (1) of this section.

(5) *Provisions for small volume manufacturers.* (i) Small volume manufacturers, as defined in this part, are exempt from the Tier 2 LDV/LLDT exhaust and

evaporative emissions phase-in requirements for model years 2004, 2005 and 2006 in Table S04-7 of this paragraph (k), but must comply with the 100% requirement for the 2007 and later model years for exhaust and evaporative emissions. If not complying with Tier 2 requirements during 2004, 2005 and 2006, small volume manufacturers must comply with the requirements for interim non-Tier 2 LDV/LLDTs.

(ii) Small volume manufacturers, as defined in this part, are exempt from the HLDT/MDPV exhaust and evaporative phase-in requirement for model year 2008 in Table S04-8 of this section but must comply with the 100% requirement for the 2009 model year. Small volume manufacturers are also exempt from the HLDT/MDPV interim fleet average NO_x standard (0.20 g/mi) and its phase-in for the 2004, 2005 and 2006 model years.

(iii) Small volume manufacturers must comply with the FTP exhaust emission standards from Tables S04-1 and 2 of paragraph (c) of this section for all HLDT/MDPVs of model years 2004 and later, except that 2004 model year HLDTs may comply with Tier 1 exhaust emission standards subject to the provisions of paragraph (1)(2)(vii) of this section, and 2004 model year MDPVs may comply with heavy-duty vehicle standards subject to the provisions of paragraph (1)(2)(viii) of this section. Small volume manufacturers must also comply with the 0.20 g/mi fleet average NO_x standard for 2007 and 2008 model year HLDT/MDPVs; the Tier 2 0.07 g/mi fleet average NO_x standard for the 2009 and later model year HLDT/MDPVs; and the evaporative emission standards in Table S04-3 of this section for the 2009 and later model years.

(iv) Vehicles produced by small volume manufacturers, as defined in § 86.1838-01, are exempt from the LDV/LLDT evaporative emissions standards in Table S09-1 of § 86.1811-09(e) for model years 2009 and 2010, but must comply with the Tier 2 evaporative emission standards in Table S04-3 in paragraph (e)(1) of this section for model years 2009 and 2010.

(v) Vehicles produced by small volume manufacturers, as defined in § 86.1838-01, are exempt from the HLDT/

MDPV evaporative emissions standards in Table S09-1 of § 86.1811-09(e) for model years 2010 and 2011, but must comply with the Tier 2 evaporative emission standards in Table S04-3 in paragraph (e)(1) of this section for model years 2010 and 2011.

(vi) Small volume manufacturers, as defined in § 86.1838-01, are exempt from the LDV/LLDT cold temperature NMHC phase-in requirements in Table S10-1 of § 86.1811-10(g) for model years 2010, 2011, and 2012, but must comply with the 100% requirement for 2013 and later model years for cold temperature NMHC standards.

(vii) Small volume manufacturers, as defined in § 86.1838-01, are exempt from the HLDT/MDPV cold temperature NMHC phase-in requirements in Table S10-1 of § 86.1811-10(g) for model years 2012, 2013, and 2014, but must comply with the 100% requirement for 2015 and later model years for cold temperature NMHC standards.

(6)(i) A manufacturer may elect an alternate phase-in schedule that results in 100% phase-in for LDV/LLDTs by 2007. Alternate phase-in schedules must produce a sum of at least 250% when the percentages of LDV/LLDTs certified to Tier 2 requirements for each model year from 2001 through 2007 are summed. As an example, a 10/25/50/65/100 percent phase-in that began in 2003 would have a sum of 250 percent and would be acceptable. However, a 10/25/40/70/100 percent phase-in that began the same year would have a sum of 245 percent and would not be acceptable.

(ii) A manufacturer electing this option for LDV/LLDTs may calculate its compliance with the evaporative standards in paragraph (e)(1) of this section separately from its compliance with Tier 2 exhaust standards, provided that the phase-in schedules for each separately produce a sum of at least 250 percent when calculated as described in paragraph (k)(6)(i) of this section. A vehicle counted towards compliance with any phase-in requirement for the Tier 2 exhaust standards or the evaporative standards in paragraph (e)(1) of this section, must comply with all applicable Tier 2 exhaust standards or all evaporative standards, as applicable, described in this section.

(iii) In addition to the requirements of paragraphs (k)(6)(i) and (ii) of this section, except as permitted in paragraph (k)(6)(vii) of this section, a manufacturer of LDV/LLDTs electing to use an alternate phase-in schedule for compliance with the Tier 2 exhaust standards or the evaporative standards in paragraph (e)(1) of this section must ensure that the sum of the percentages of vehicles from model years 2001 through 2004, meeting such exhaust or evaporative standards, as applicable, is at least 25%.

(iv) A manufacturer may elect an alternate phase-in schedule that results in 100% phase-in for HLD/MDPVs by 2009. The requirements of paragraphs (k)(6)(i) through (k)(6)(ii) of this section apply, except that for HLD/MDPVs, the calculation described in paragraphs (k)(6)(i) and (k)(6)(ii) of this section may cover model years 2001 through 2009 and must produce a sum of at least 150%.

(v) A manufacturer electing to use any alternate phase-in schedule permitted under this section must provide in its Application for Certification for the first year in which it intends to use such a schedule, and in each succeeding year during the phase-in, the intended phase-in percentages for that model year and the remaining phase-in years along with the intended final sum of those percentages as described in this paragraph (k)(6). This information may be included with the information required under § 86.1844-01(d)(13). In its year end annual reports, as required under § 86.1844-01(e)(4) the manufacturer must include sufficient information so that the Administrator can verify compliance with the alternative phase-in schedule established under paragraph (k)(6) of this section.

(vi) Under an alternate phase-in schedule, the projected phase-in percentage is not binding for a given model year, provided the sums of the actual phase-in percentages that occur meet the appropriate total sums as required in paragraph (k)(6) of this section, and provided that 100% actual compliance is reached for the appropriate model year, either 2007 or 2009, as described in paragraph (k)(6) of this section.

(vii) A manufacturer unable to meet the 25% requirement in paragraph (k)(6)(iii) of this section, must:

(A) Ensure that the sum of the percentages of vehicles for model years 2001 through 2004, meeting such exhaust or evaporative standards, as applicable, is at least 20%.

(B) Subtract that sum of percentages for model years 2001 through 2004 from 25%, and multiply the unrounded result by 2.

(C) Round the product from paragraph (k)(6)(vii)(B) of this section to the nearest 0.1% and add that to 50%. That sum becomes the required phase-in percentage for the 2005 model year.

(D) Comply with the phase-in percentage for the 2005 model year determined in paragraph (k)(6)(vii)(C) of this section.

(E) Comply with a minimum phase-in percentage for the 2006 model year determined by the following equation:

$$\begin{aligned} &\text{minimum phase-in percentage for 2006} \\ &= [75\% - (2005_{\text{api}} - 2005_{\text{rpi}})] \end{aligned}$$

Where:

2005_{rpi} = the required phase-in for the 2005 model year as determined in paragraph (k)(6)(vii)(C) of this section; and

2005_{api} = the manufacturer's actual phase-in quantity for the 2005 model year.

(7)(i) Sales percentages for the purpose of determining compliance with the phase-in of the Tier 2 requirements and the phase-in of the evaporative standards in paragraph (e)(1) of this section, must be based upon projected U.S. sales of LDV/LLDTs and HLD/MDPVs of the applicable model year by the manufacturer to the point of first sale. Such sales percentages must be rounded to the nearest one tenth of a percent, and must not include vehicles and trucks projected to be sold to points of first sale in California or a state that has adopted California requirements for that model year as permitted under section 177 of the Act.

(ii) Alternatively, the manufacturer may petition the Administrator to allow actual volume produced for U.S. sales to be used in lieu of projected U.S. sales for purposes of determining compliance with the phase-in percentage requirements under this section. The manufacturer must submit its petition within 30 days of the end of the

model year to the Vehicle Programs and Compliance Division. For EPA to approve the use of actual volume produced for U.S. sales, the manufacturer must establish to the satisfaction of the Administrator, that actual production volume is functionally equivalent to actual sales volume of LDV/LLDTs and HLD/MDPVs sold in states other than California and states that have adopted California standards.

(iii) Manufacturers must submit information showing compliance with all phase-in requirements of this section with its Part I application as required by § 86.1844(d)(13).

(1) *FTP exhaust standards for interim non-Tier 2 vehicles*—(1) *FTP exhaust emission standards for interim non-Tier 2 LDV/LLDTs*. (i) LDV/LLDTs that are not used to meet the Tier 2 phase-in requirements including the Tier 2 fleet average NO_x requirement during the Tier 2 phase-in period (model years 2004–2006) must comply with the full useful life FTP exhaust emission standards listed in Table S04-1 of paragraph (c) of this section and the corresponding intermediate useful life standards, if any, in Table S04-2 of paragraph (c) of this section. Manufacturers may choose the bin of full useful life standards to which they certify a test group of vehicles, subject to the requirements in paragraph (1)(3)(i) of this section. In a given model year, an individual vehicle may not be used to comply with both the Tier 2 fleet average NO_x standard and the applicable interim fleet average NO_x standard although vehicles from the same test group may be separated and the vehicles counted toward compliance with either program.

(ii) The provisions of paragraphs (c) (1), (2) and (3) of this section apply to flexible-fueled, dual fuel and multi-fuel interim non-Tier 2 LDV/LLDTs.

(iii) Only manufacturers that comply with the applicable FTP standards in Tables S04-1 and 2 of paragraph (c) of this section for all of their 2004 model year HLD/MDPVs and declare their intention to comply with the 2004 model year 25% phase-in requirement to the 0.20 g/mi interim fleet average NO_x standard for HLD/MDPVs (or HLD/MDPVs) described in this paragraph (1) may use the optional higher NMOG values for

interim LDT2s certified to bin 9 standards that are shown in Tables S04-1 and 2. Manufacturers must declare their intention to comply with the full 2004 model year 25% phase-in requirement in Part I of their HLD/MDPV, as applicable, certification applications.

(iv) The provisions of paragraph (c)(4) of this section apply to interim non-Tier 2 vehicles.

(2) *FTP exhaust emission standards for interim non-Tier 2 HLD/MDPVs and interim non-Tier 2 MDPVs*. (i) Except as permitted under paragraphs (1)(2) (vii) and (viii) of this section, HLD/MDPVs of model years 2004–2008 that are not used to meet the Tier 2 FTP phase-in requirements including the Tier 2 fleet average NO_x requirement must comply with the full useful life FTP exhaust emission standards listed in Table S04-1 of paragraph (c) of this section and, the corresponding intermediate useful life standards, if any, in Table S04-2 of paragraph (c) of this section. Manufacturers may choose the bin of full useful life standards to which they certify a test group of vehicles, subject to the requirements in paragraph (1)(3)(ii) of this section.

(ii) Except as permitted under paragraphs (1)(2) (vii) and (viii) of this section, HLD/MDPVs of model years 2004–2008 that are not used to meet the Tier 2 FTP phase-in requirements including the Tier 2 fleet average NO_x requirement must comply with the fleet average NO_x standard described in paragraph (1)(3)(ii) of this section subject to the phase-in schedule in paragraph (1)(2)(iv) of this section, i.e. 25 percent of the HLD/MDPVs must meet the fleet average standard of 0.20 g/mi in 2004, 50 percent in 2005, and so on.

(iii) Manufacturers may choose the bin of full useful life standards and corresponding intermediate life standards to which they certify test groups of HLD/MDPVs, subject to the requirements in paragraph (1)(3)(ii) of this section. Manufacturers may include HLD/MDPVs in the interim program that are not used to meet the Tier 2 fleet average NO_x standard or the phase-in percentage requirements in the Tier 2 program or to generate Tier 2 NO_x credits. In a given model

year, an individual vehicle may not be used to comply with both the Tier 2 fleet average NO_x standard and the applicable interim fleet average NO_x standard although vehicles from the same test group may be separated and the vehicles counted toward compliance with either program.

(iv) *Phase-in schedule for interim non-Tier 2 HLD/MDPVs.* Table S04-9 of this paragraph (1) specifies the minimum percentage of the manufacturer's interim non-Tier 2 HLD/MDPV U.S. sales, by model year, that must comply with the fleet average NO_x standard described in paragraph (1)(3)(ii) of this section. Table S04-9 follows:

TABLE S04-9—PHASE-IN PERCENTAGES FOR COMPLIANCE WITH INTERIM NON-TIER 2 FLEET AVERAGE NO_x STANDARD FOR HLD/MDPVs

Model year	Percentage of non-tier 2 HLD/MDPVs that must meet interim non-tier 2 fleet average NO _x standard
2004	25
2005	50
2006	75
2007 and 2008	100

(v)(A) A manufacturer may elect an alternate phase-in schedule, beginning as early as the 2001 model year, that results in 100% compliance by 2007 with the fleet average NO_x standard for interim non-Tier 2 HLD/MDPVs described in paragraph (1)(3)(ii) of this section. The requirements of paragraph (k)(6) of this section apply to the selection of an alternate phase-in schedule.

(B) If a manufacturer elects not to bring all of its HLD/MDPVs into compliance with the interim requirements in 2004 as permitted under paragraphs (1)(2)(vii) and

(viii) of this section, it may still use an alternate phase-in schedule to attain 100% compliance with the interim fleet average NO_x standard for HLD/MDPVs, but the sum of phase-in percentages it must meet will be 225% rather than 250%. If the manufacturer commences its 2004 model year on or after December 21, 2003, for any HLD/MDPVs, the manufacturer must increase the 225% by the fraction of its 2004 model year HLD/MDPVs whose

model year commenced on or after that date and which were brought into compliance with the 0.20 g/mi corporate average NO_x standard as required under paragraph (1)(2)(ix) of this section. The manufacturer must ensure that the sum of the percentages of vehicles up through model year 2005 complying with the interim fleet average NO_x standard is at least 50%.

(vi) The provisions of paragraphs (c) (1), (2) and (3) of this section apply to flexible-fueled, dual fuel and multi-fuel interim non-Tier 2 HLD/MDPVs.

(vii) For 2004 model year HLD/MDPV test groups whose model year commences before December 21, 2003, the manufacturer may exempt such HLD/MDPVs from compliance with any requirements applicable to interim non-Tier 2 HLD/MDPVs, and such HLD/MDPVs must be produced in accordance with standards and requirements in §§ 86.1814-02 and 86.1815-02. Such HLD/MDPVs must also meet the refueling emission standards contained in paragraph (e)(3) of this section.

(viii) For 2004 model year heavy-duty vehicles whose model year commences before December 21, 2003, the manufacturer may exempt such vehicles from compliance with any requirements applicable to interim non-Tier 2 MDPVs. Exempted vehicles will not be considered MDPVs and must be produced in accordance with standards and requirements in § 86.099-10. Exempted vehicles are also exempted from refueling emission standards.

(ix) For 2004 model year HLD/MDPV test groups whose model year commences on or after December 21, 2003, the manufacturer must comply with all interim non-Tier 2 requirements in this section.

(A) All such vehicles, but not more than 25% of the manufacturer's total sales of 2004 model year HLD/MDPVs must meet the interim non-Tier 2 fleet average NO_x standard as described in paragraph (1)(3)(ii) of this section.

(B) All such vehicles but not more than 40% of the manufacturer's 2004 model year HLD/MDPVs must comply with the refueling requirements in paragraph (e)(3) of this section.

(x) Only those manufacturers that comply with the interim non-Tier 2 FTP standards for all of their 2004 model year HLD/MDPVs and declare their

intention to comply with the 2004 model year 25% phase-in requirement to the fleet average interim NO_x standard for HLDTs or HLDT/MDPVs of 0.20 g/mi described in paragraph (1) of this section may use the optional higher NMOG values for interim LDT4s certified to bin 10 standards that are shown in Tables S04-1 and 2 of paragraph (c) of this section. Manufacturers must declare their intention to comply with the 2004 model year 25% phase-in requirement in Part I of their HLDT certification applications.

(xi) Only those manufacturers that comply with the interim non-Tier 2 FTP standards for all of their 2004 model year MDPVs, and declare their intention to comply with the 2004 model year 25% phase-in requirement to the fleet average interim NO_x standard for MDPVs or HLDT/MDPVs of 0.20 g/mi described in paragraph (1) of this section may:

(A) Use the exhaust emission standards of bin 11 in Tables S04-1 and S04-2 of paragraph (c) in this section for MDPVs through model year 2008;

(B) For diesel-fueled vehicles, certify the engines in such vehicles, through model year 2007, to provisions in this part 86 applicable to diesel-fueled heavy-duty engines of the appropriate model year. Such diesel fueled vehicles must not be included in any count or determination of compliance with the phase-in requirements applicable to interim non-Tier 2 MDPVs; and

(C) Use the optional higher NMOG values for interim LDT4s certified to bin 10 standards that are shown in Tables S04-1 and 2.

(xii) Manufacturers electing to comply with the provisions of paragraph (1)(2)(xi) of this section must declare their intention to comply with the 2004 model year 25% phase-in requirement to the fleet average interim NO_x standard for MDPVs or HLDT/MDPVs of 0.20 g/mi in Part I of their MDPV certification applications.

(xiii) Where diesel-fueled heavy-duty engines are used as permitted under paragraph (1)(2)(xi)(B) of this section, such engines must be treated as a separate averaging set—MDPV HDDEs—under the averaging, banking and trading provisions applicable to heavy-duty diesel engines. Only NO_x credits gen-

erated by engine-certified diesel engines that are used in other MDPVs can be applied to these engines. Manufacturers wishing to average, bank or trade credits for MDPV HDDEs must comply with the requirements in this paragraph and with all requirements applicable to heavy-duty engine averaging, banking and trading in this part.

(3) *Fleet average NO_x standards for interim non-Tier 2 LDV/Ts and MDPVs.* (i) Manufacturers must comply with a fleet average full useful life NO_x standard for their interim non-Tier 2 LDV/LLDTs, on an annual basis, of 0.30 grams per mile.

(ii) Manufacturers must comply with a fleet average full useful life NO_x standard for their interim non-Tier 2 HLDT/MDPVs, excluding those HLDTs and MDPVs not yet covered by the phase-in requirement described in paragraph (1)(2)(ii) of this section, on an annual basis, of 0.20 grams per mile.

(iii) Manufacturers must determine their compliance with these interim fleet average NO_x standards for each model year by separately computing the sales weighted average NO_x level of all interim non-Tier 2 LDV/LLDTs and all interim non-Tier 2 HLDT/MDPVs (excluding those not yet phased in as described in paragraph (1)(2)(ii) of this section), using the methodology in § 86.1860.

(iv) Manufacturers may generate, bank, average, trade and use interim non-Tier 2 NO_x credits based on their NO_x fleet average as determined under paragraph (1)(3)(iii) of this section. Unless waived or modified by the Administrator, the provisions of § 86.1861 of this part apply to the generation, banking, averaging, trading and use of credits generated by interim non-Tier 2 vehicles. NO_x credits generated by interim non-Tier 2 vehicles are not subject to any discount except as required by § 86.1861-04(e).

(m) *NMOG standards for diesel, flexible fueled and dual-fueled LDV/Ts and MDPVs.* (1) For diesel fueled LDV/Ts and MDPVs, the term “NMOG” in both the Tier 2 and interim non-Tier 2 standards means non-methane hydrocarbons.

(2) Flexible-fueled and dual-fuel Tier 2 and interim non-Tier 2 vehicles must

be certified to NMOG exhaust emission standards both for operation on gasoline and on any alternate fuel they are designed to use. Manufacturers may measure NMHC in lieu of NMOG when flexible-fueled and dual-fuel vehicles are operated on gasoline, subject to the requirements of § 86.1810(p).

(n) *Requirements for vehicles with rechargeable energy storage systems.* Manufacturers must measure emissions from hybrid electric vehicles (including plug-in hybrid electric vehicles) as described in 40 CFR part 1066, subpart F, except that these procedures do not apply for plug-in hybrid electric vehicles during charge-depleting operation.

(o) *NMOG measurement.* (1) Manufacturers must measure NMOG emissions using the procedures described in 40 CFR 1066.635.

(2) Manufacturers must not apply reactivity adjustment factors (RAFs) to NMOG measurements. See § 86.1841.

(p) *In-use standards.* (1) Table S04-10 of this paragraph (p) contains in-use emission standards applicable only to vehicles certified to the bins shown in

the table. These standards apply to in-use testing performed by the manufacturer pursuant to regulations at §§ 86.1845-01, 86.1845-04 and 86.1846-01 and to in-use testing performed by EPA. These standards do not apply to certification or Selective Enforcement Auditing.

(2) These standards apply only to LDV/LLDTs produced up through the 2008 model year, and HLDV/MDPVs produced up through the 2010 model year. These standards are subject to other limitations described in paragraph (p)(3) of this section.

(3) For the first model year and also for the next model year after that, in which a test group of vehicles is certified to a bin of standards to which it has not previously been certified, the standards in Table S04-10 of this paragraph (p) apply for purposes of in-use testing only. The standards apply equally to all LDV/Ts and MDPVs subject to the model year limitation in paragraph (p)(2) of this section. Table S04-10 follows:

TABLE S04-10—IN-USE COMPLIANCE STANDARDS (G/Mi)

[Certification standards shown for reference purposes]

Bin number	Durability period (miles)	NO _x In-use	NO _x certification	NMOG In-use	NMOG certification
5	50,000	0.07	0.05	n/a	0.075
5	120,000	0.10	0.07	n/a	0.090
4	120,000	0.06	0.04	n/a	0.070
3	120,000	0.05	0.03	0.09	0.055
2	120,000	0.03	0.02	0.02	0.010

(4) For diesel vehicles certified to bin 10, separate in-use standards apply for NO_x and PM emissions. These standards are determined by multiplying the applicable NO_x and PM certification standards by factors of 1.2 and 1.35, respectively, and then rounding the result to one more decimal place than contained in the certification standard. The resultant standards do not apply for certification or selective enforcement auditing.

(5) For diesel vehicles certified to bin 7 and bin 8 only in model years 2007 through 2009, a manufacturer may optionally comply with the bin 5 FTP PM standard shown in Table S04-1. For diesel vehicles choosing this option, separate in-use NO_x standards apply at

high altitude conditions as defined in § 86.1803-01. These standards are determined by multiplying the applicable NO_x certification standards by a factor of 1.2. The resultant standards apply only in-use at high altitude conditions and do not apply for certification or selective enforcement auditing. A manufacturer choosing this option must certify such vehicles to the applicable FTP NO_x and PM standards for a full useful life of 150,000 miles or 15 years, whichever occurs first. A manufacturer choosing this option would not be allowed to generate additional credits as described under § 86.1860-04 (g).

(q) *Hardship provision for small volume manufacturers.* (1) A small volume manufacturer may apply for relief from any

applicable final phase-in model year contained in this section. Relief will only be available to defer required compliance with a completely new set of standards, a fleet average NO_x standard, and/or evaporative emission standard for 100% of affected vehicles for one model year. Thus, a small volume manufacturer that obtains relief may:

- (i) Defer 100% compliance with the fleet average NO_x standard for interim LDV/LLDTs (0.30 g/mi) until 2005;
- (ii) Defer 100% compliance with the evaporative emission standards and/or fleet average NO_x standard for Tier 2 LDV/LLDTs (0.07 g/mi) until 2008;
- (iii) Defer 100% compliance with the requirements that interim HLDTs and MDPVs comply with applicable emission standards shown in Tables S04-1 and S04-2, until 2005;
- (iv) Defer 100% compliance with the fleet average NO_x standard for interim HLDT/MDPVs (0.20 g/mi) until 2008; and
- (v) Defer 100% compliance with the evaporative emission standards and/or fleet average NO_x standard for Tier 2 HLDT/MDPVs (0.07 g/mi) until 2010.
- (vi) Defer compliance with the LDV/LLDT evaporative emissions standards in Table S09-1 of § 86.1811-09(e) until 2013, and defer 100% compliance with the LDV/LLDT evaporative emissions standards in Table S09-2 of § 86.1811-09(e) until 2016. (The hardship relief may be extended one additional model year—two model years total.)
- (vii) Defer compliance with the HLDT/MDPV evaporative emissions standards in Table S09-1 of § 86.1811-09(e) until 2014, and defer 100% compliance with the HLDT/MDPV evaporative emissions standards in Table S09-2 of § 86.1811-09(e) until 2016. (The hardship relief may be extended one additional model year—two model years total.)
- (viii) Defer 100% compliance with the LDV/LLDT cold temperature NMHC standards in Table S10-X of § 86.1811-10(g) until 2015. (The hardship relief may be extended one additional model year—two model years total.)
- (ix) Defer 100% compliance with the HLDT/MDPV cold temperature NMHC standards in Table S10-X of § 86.1811-10(g) until 2017. (The hardship relief

may be extended one additional model year—two model years total.)

(2) Applications for relief must be in writing and must:

- (i) Be submitted before the earliest date of noncompliance;
 - (ii) Include evidence that the manufacturer will incur severe economic hardship if relief is not granted;
 - (iii) Include evidence that the noncompliance will occur despite the best efforts of the manufacturer to comply; and
 - (iv) Include evidence that the manufacturer has made every reasonable effort to purchase credits to address the noncompliance, where applicable.
- (r) *NMOG standard adjustment for direct ozone reducing devices.* (1) A manufacturer may obtain NMOG credit for use in certifying to the exhaust NMOG standards listed in paragraph (c) of this section and for use in complying with the in-use standards of paragraph (p) of this section, where applicable. This credit effectively allows the manufacturer to increase the exhaust NMOG emission standards listed in these paragraphs by the amount of the applicable credit. For example, if the applicable NMOG credit was 0.01 g/mi, and the vehicle was being certified in Bin 5, as described in Table S04-1 of paragraph (c) of this section, exhaust NMOG emissions must be no greater than 0.10 g/mi, as opposed to the normal NMOG certification standard of 0.09 g/mi in Bin 5.
- (2) The NMOG credit must be determined through a two-step process.
- (i) The first step must determine the ozone reduction potential of the direct ozone reducing device, the ozone reduction potential of exhaust NMOG reductions beyond Bin 5 of the Tier 2 standards, and the ratio of the two methods of reducing ambient ozone levels. The requirements for this step are described in paragraph (r)(3) of this section.
 - (ii) The second step must demonstrate and certify the relevant performance characteristics of the specific ozone reducing device. The requirements for this step are described in paragraph (r)(4) of this section.
 - (3) The ozone reduction potential of the direct ozone reducing device and the ozone reduction potential of exhaust NMOG reductions beyond Bin 5

of the Tier 2 standards must be estimated using procedures which are approved by the Administrator in advance. At a minimum:

(i) The modeling must utilize an urban airshed model using up-to-date chemical and meteorological simulation techniques;

(ii) Four local areas must be modeled: New York City, Chicago, Atlanta and Houston;

(iii) The ozone episodes to be modeled must meet the selection criteria established by EPA for State ozone SIPs;

(iv) Photochemical and dispersion modeling must follow that used by EPA to project the ozone impacts of this rule, or its equivalent;

(v) Emission projections must be made for calendar year 2007 and be consistent with those used by EPA in support of this final rule, or reflect updates approved by EPA;

(vi) Baseline emissions (emissions prior to use of the direct ozone reducing device or the VOC emission reductions) must include the benefits of the Tier 2 emission and sulfur standards; as well as all other emission controls assumed in EPA's ozone modeling of the benefits of the Tier 2 and sulfur standards, as described in the Final Regulatory Impact Analysis to the Tier 2 and Sulfur Rule;

(vii) The ozone benefit of the direct ozone reducing device must assume a radiator area of 0.29 square meters, an air flow velocity through the radiator of 40% of vehicle speed, and an ozone reduction efficiency of 80%, or other values as approved by the Administrator;

(viii) The ozone level of the air entering the direct ozone reducing device must be assumed to be 40% less than that existing in the grid cell where the vehicle is located;

(ix) The ozone benefit of VOC emission reductions must be modeled by assuming that all Tier 2 LDVs, LDTs and MDPVs meet an exhaust NMOG standard of 0.055 g/mi or lower instead of a 0.09 g/mi NMOG standard;

(x) The ozone reducing device must be assumed to be present on all of the Tier 2 LDVs, LDTs and MDPVs modeled as meeting the more stringent NMOG standard described in paragraph (r)(3)(ix) of this section;

(xi) The relationship between changes in exhaust NMOG emission standards and in-use VOC emissions must be determined sufficiently far in the future to ensure that the change in ozone being modeled is sufficiently large to allow comparison with the impact of the ozone reducing device;

(xii) LDV, LDT and MDPV emissions must be modeled using the updated Tier 2 emission model developed by EPA as part of the Tier 2 rulemaking (available from EPA upon request) or MOBILE6, once this model is available;

(xiii) The ozone benefit of the direct ozone reducing device must be the reduction in the peak one-hour ozone level anywhere in the modeled region on the day when ozone is at its highest;

(xiv) The NMOG credit in each local area must be the reduction in peak one hour ozone associated with use of the direct ozone reducing device divided by the reduction in peak one hour ozone associated with the more stringent exhaust NMOG emission standard multiplied by the reduction the exhaust NMOG standard (in g/mi) modeled in paragraph (r)(3)(ix) of this section; and

(xv) The NMOG credit applicable to the generic direct ozone reducing device modeled in paragraph (r)(3)(vii) of this section must be determined by arithmetically averaging the NMOG credit determined in paragraph (r)(3)(xiv) of this section for each of the four local areas.

(4) The manufacturer must submit data, using procedures which have been approved by the Administrator in advance, that demonstrate the following aspects of the device being certified:

(i) The air flowrate through the device as a function of vehicle speed;

(ii) The ozone reduction efficiency of the device over the useful life of the vehicle for a range of vehicle speeds and ozone levels;

(iii) The method through which the onboard diagnostic system will detect improper performance.

(5) The NMOG credit for the specific application of this technology tested under the provisions of paragraph (r)(4) of this section is the four-area NMOG credit determined in paragraph (r)(3)(xv) of this section scaled based on the performance of the specific application tested under the provisions of

paragraph (r)(4) of this section relative to those assumed in paragraph (r)(3)(vii) of this section. This scaling must assume a linear relationship between the NMOG credit and three aspects of the direct ozone reducing device: radiator area, average air flow through the radiator relative to vehicle speed, and ozone reduction efficiency and the NMOG credit. The NMOG credit must be rounded to the nearest 0.001 g/mi. For example, if the NMOG credit determined in paragraph (r)(3)(xv) of this section was 0.01 g/mi and the specific direct ozone reducing device being certified had an area of 0.20 square meters, an air flow velocity of 30% of vehicle speed and an ozone reducing efficiency of 70%, and the generic ozone reducing device simulated in the ozone model under paragraph (r)(3)(vii) of this section had an area of 0.29 square meters, an air flow velocity of 40% of vehicle speed and an ozone reducing efficiency of 80%, the NMOG credit applicable to the specific device being certified would be:

$$0.01 \text{ g/mi} * (0.20/0.29) * (30\%/40\%) * 70\%/80\% = 0.005$$

(s) Manufacturers may request to group heavy-duty vehicles into the same test group as other vehicles subject to more stringent standards, so long as all vehicles in the test group meet the most stringent standards applicable to any vehicle within that test group, as provided at § 86.1827-1(a)(5) and (d)(4).

[65 FR 6854, Feb. 10, 2000; 65 FR 10598, Feb. 28, 2000, as amended at 65 FR 59970, Oct. 6, 2000; 66 FR 19309, Apr. 13, 2001; 67 FR 72825, Dec. 6, 2002; 70 FR 40443, July 13, 2005; 71 FR 16060, Mar. 30, 2006; 72 FR 8562, Feb. 26, 2007; 76 FR 57377, Sept. 15, 2011; 79 FR 23713, Apr. 28, 2014]

§ 86.1811-09 Emission standards for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles.

Section 86.1811-09 includes text that specifies requirements that differ from § 86.1811-04. Where a paragraph in § 86.1811-04 is identical and applicable to § 86.1811-09, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.1811-04.” Where a corresponding paragraph of § 86.1811-04 is

not applicable, this is indicated by the statement “[Reserved]”

(a) *Applicability.* (1) This section contains regulations implementing emission standards for all LDVs, LDTs and MDPVs. This section applies to 2009 and later model year LDVs, LDTs and MDPVs fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels, except as noted. Additionally, this section applies to hybrid electric vehicles (HEVs) and zero emission vehicles (ZEVs). Unless otherwise specified, multi-fueled vehicles must comply with all requirements established for each consumed fuel.

(2) through (4) [Reserved]. For guidance see § 86.1811-04.

(5) The exhaust emission standards and evaporative emission standards of this section apply equally to certification and in-use LDVs, LDTs and MDPVs, unless otherwise specified. See paragraph (t) of this section for interim evaporative emission in-use standards that are different than the certification evaporative emission standards specified in paragraph (e) of this section.

(b) through (d) [Reserved]. For guidance see § 86.1811-04.

(e) *Evaporative emission standards.* Evaporative emissions from gasoline-fueled, natural gas-fueled, liquefied petroleum gas-fueled, ethanol-fueled and methanol-fueled vehicles must not exceed the standards in this paragraph (e) at low altitude conditions. The evaporative emission standards specified in § 86.1811-04(e)(1) continue to apply at high altitude conditions. The standards apply equally to certification and in-use vehicles.

(1) *Diurnal-plus-hot soak evaporative hydrocarbon standards.* (i) Hydrocarbons for LDV/LLDTs, HLDTs and MDPVs that are gasoline-fueled, dedicated natural gas-fueled, dedicated liquefied petroleum gas-fueled, dedicated ethanol-fueled, dedicated methanol-fueled and multi-fueled vehicles when operating on gasoline must not exceed the diurnal plus hot soak standards shown in Table S09-1 for the full three diurnal test sequence and for the supplemental two diurnal test sequence. The standards apply equally to certification and in-use vehicles, except as otherwise

specified in paragraph (t) of this section. Table S09-1 follows:

TABLE S09-1—LIGHT-DUTY DIURNAL PLUS HOT SOAK EVAPORATIVE EMISSION STANDARDS
[grams per test]

Vehicle category	Model year	3 day diurnal+hot soak	Supplemental 2 day diurnal+hot soak
LDVs	2009	0.50	0.65
LLDTs	2009	0.65	0.85
HLDTs	2010	0.90	1.15
MDPVs	2010	1.00	1.25

(ii) Hydrocarbons for LDV/LLDTs, HLDTs and MDPVs that are multi-fueled vehicles operating on non-gasoline fuel must not exceed the diurnal plus hot soak standards shown in Table S09-2 for the full three diurnal test sequence and for the supplemental two diurnal test sequence. The standards apply equally to certification and in-use vehicles except as otherwise specified in paragraph (t) of this section. Table S09-2 follows:

TABLE S09-2—LIGHT-DUTY DIURNAL PLUS HOT SOAK EVAPORATIVE EMISSION STANDARDS: NON-GASOLINE PORTION OF MULTI-FUELED VEHICLES

[grams per test]		
Vehicle category	3 day diurnal+hot soak	Supplemental 2 day diurnal+hot soak
LDVs	0.50	0.65
LLDTs	0.65	0.85
HLDTs	0.90	1.15
MDPVs	1.00	1.25

(iii) For multi-fueled vehicles operating on non-gasoline fuel, manufacturers must comply with the phase-in requirements in Table S09-3 of this paragraph for the evaporative emission requirements specified in Table S09-2 of this section. Phase-in schedules are grouped together for LDV/LLDTs and HLDT/MDPVs. These requirements specify the minimum percentage of the manufacturer's LDV/LLDT/HLDT/MDPV 50-State sales, by model year, that must meet the requirements for their full useful lives. Table S09-3 follows:

TABLE S09-3—PHASE-IN PERCENTAGES FOR LIGHT-DUTY DIURNAL PLUS HOT SOAK EVAPORATIVE EMISSION STANDARDS: NON-GASOLINE PORTION OF MULTI-FUELED VEHICLES

Model year	Percentage of vehicles that must meet evaporative emission requirements
2012	30
2013	60
2014 and subsequent	100

(2) through (6) [Reserved]. For guidance see § 86.1811-04.

(7) In cases where vehicles are certified to evaporative emission standards in Tables S09-1 and S09-2 of this section, the Administrator may accept evaporative emissions data for low altitude testing in accordance with California test conditions and test procedures (in lieu of the evaporative emission test condition and test procedure requirements of subpart B of this part).

(f) through (s) [Reserved]. For guidance see § 86.1811-04.

(t) *Evaporative emission in-use standards.* (1) For LDVs and LLDTs certified prior to the 2012 model year, the Tier 2 LDV/LLDT evaporative emissions standards in Table S04-3 of § 86.1811-04(e) shall apply to in-use vehicles for only the first three model years after an evaporative family is first certified to the LDV/LLDT evaporative emission standards in Table S09-1 of paragraph (e) of this section, as shown in Table S09-4. For example, evaporative families first certified to the LDV/LLDT standards in Table S09-1 in the 2011 model year must meet the Tier 2 LDV/LLDT evaporative emission standards (Table S04-3) in-use for 2011, 2012, and 2013 model year vehicles (applying Tier

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2 standards in-use is limited to the first three years after introduction of a vehicle).

(2) For HLDTs and MDPVs certified prior to the 2013 model year, the Tier 2 HLDT/MDPV evaporative emissions standards in Table S04-3 of § 86.1811-04(e) shall apply to in-use vehicles for only the first three model years after an evaporative family is first certified to the HLDT/MDPV evaporative emission standards in Table S09-1 of paragraph (e) of this section, as shown in Table S09-5. For example, evaporative families first certified to the HLDT/MDPV standards in Table S09-1 in the 2012 model year must meet the Tier 2 HLDT/MDPV evaporative emission standards (Table S04-3) in-use for 2012, 2013, and 2014 model year vehicles (applying Tier 2 standards in-use is limited to the first three years after introduction of a vehicle).

TABLE S09-4—SCHEDULE FOR IN-USE LDV/LLDT DIURNAL PLUS HOT SOAK EVAPORATIVE EMISSION STANDARDS

Model Year of Introduction	2009	2010	2011
Models Years That Tier 2 Standards Apply to In-use Vehicles	2009 2010 2011	2010 2011 2012	2011 2012 2013

TABLE S09-5—SCHEDULE FOR IN-USE HLDT/MDPV DIURNAL PLUS HOT SOAK EVAPORATIVE EMISSION STANDARDS

Model Year of Introduction	2010	2011	2012
Models Years That Tier 2 Standards Apply to In-use Vehicles	2010 2011 2012	2011 2012 2013	2012 2013 2014

[72 FR 8562, Feb. 26, 2007; 72 FR 13352, Mar. 21, 2007, as amended at 76 FR 39521, July 6, 2011]

§ 86.1811-10 Emission standards for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles.

Section 86.1811-10 includes text that specifies requirements that differ from §§ 86.1811-04 and 86.1811-09. Where a paragraph in § 86.1811-04 or § 86.1811-09 is identical and applicable to § 86.1811-10, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.1811-04” or “[Reserved]. For guid-

ance see § 86.1811-09.” Where a corresponding paragraph of § 86.1811-04 or § 86.1811-09 is not applicable, this is indicated by the statement “[Reserved]”

(a) [Reserved]. For guidance see § 86.1811-09.

(b) through (d) [Reserved]. For guidance see § 86.1811-04.

(e) [Reserved]. For guidance see § 86.1811-09.

(f) [Reserved]. For guidance see § 86.1811-04.

(g) *Cold temperature exhaust emission standards.* (1) Cold temperature CO standards. These cold temperature CO standards are applicable only to gasoline fueled LDV/Ts and MDPVs. Cold temperature CO exhaust emission standards apply over a useful life of 50,000 miles or 5 years (whichever occurs first) as follows:

(i) For LDVs and LDT1s, the standard is 10.0 grams per mile CO.

(ii) For LDT2s, LDT3s and LDT4s, and MDPVs, the standard is 12.5 grams per mile CO.

(iii) These standards do not apply to interim non-Tier 2 MDPVs.

(2) *Cold temperature NMHC standards.* Full useful life fleet average cold temperature NMHC standards are applicable only to gasoline fueled LDV/LLDTs and HLDT/MDPVs, and apply equally to certification and in-use except as otherwise specified in paragraph (u) of this section for in-use standards for applicable phase-in models. Testing with other fuels such as E85, or testing on diesel vehicles, is not required. Multi-fuel, bi-fuel or dual-fuel vehicles must comply with requirements using gasoline only. For LDV/LLDTs, the useful life is 120,000 miles or 10 years, whichever comes first. For HLDT/MDPVs, the useful life is 120,000 miles or 11 years, whichever comes first. There is not an intermediate useful life standard for cold temperature NMHC standards.

(i) The standards are shown in the following table:

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TABLE S10-1—FLEET AVERAGE COLD TEMPERATURE NMHC FULL USEFUL LIFE EXHAUST EMISSION STANDARDS

Vehicle weight category	Cold temperature NMHC sales-weighted fleet average standard (grams/mile)
LDVs & LLDTs ($\leq 6,000$ lbs GVWR)	0.3
HLDTs ($> 6,000$ – $8,500$ lbs GVWR) & MDPVs ($> 8,500$ – $10,000$ lbs GVWR)	0.5

(ii) The manufacturer must calculate its fleet average cold temperature NMHC emission level(s) as described in § 86.1864-10(m).

(iii) During a phase-in year, the manufacturer must comply with the fleet average standards for the required phase-in percentage for that year as specified in paragraph (g)(3) of this section, or for the alternate phase-in percentage as permitted under paragraph (g)(4) of this section.

(iv) For model years prior to 2010 (LDV/LLDTs) and 2012 (HLDT/MDPVs), where the manufacturer desires to bank early NMHC credits as permitted under § 86.1864-10(o)(5), the manufacturer must achieve a fleet average standard below the applicable standard. Manufacturers must determine compliance with the cold temperature NMHC fleet average standard according to § 86.1864-10(o).

(3) *Phase-in of the cold temperature NMHC standards.* Except as permitted in § 86.1811-04(k)(5)(vi) and (vii) regarding small volume manufacturers, manufacturers must comply with the phase-in requirements in Tables S10-2 and S10-3. Separate phase-in schedules are provided for LDV/LLDTs and for HLDT/MDPVs. These requirements specify the minimum percentage of the manufacturer's LDV/LLDT and HLDT/MDPV 50-State sales, by model year, that must meet the fleet average cold temperature NMHC standard for their full useful lives. LDVs and LLDTs must be grouped together to determine compliance with these phase-in requirements, and HLDTs and MDPVs must also be grouped together to determine compliance with these phase-in requirements. Tables S10-2 and S10-3 follow:

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TABLE S10-2—PHASE-IN PERCENTAGES FOR LDV/LLDT COLD TEMPERATURE NMHC REQUIREMENTS

Model year	Percentage of LDV/LLDTs that must meet requirement
2010	25
2011	50
2012	75
2013 and subsequent	100

TABLE S10-3—PHASE-IN PERCENTAGES FOR HLDT/MDPV COLD TEMPERATURE NMHC REQUIREMENTS

Model year	Percentage of HLDT/MDPVs that must meet requirement
2012	25
2013	50
2014	75
2015 and subsequent	100

(4) *Alternate phase-in schedules for cold temperature NMHC standards.* (i) Manufacturers may apply for alternate phase-in schedules that would still result in 100% phase-in by 2013 and 2015, respectively, for LDV/LLDTs and HLDT/MDPVs. An alternate phase-in schedule submitted by a manufacturer is subject to EPA approval. The alternate phase-in will not be used to delay full implementation past the last year of the primary phase-in schedule (2013 for LDV/LLDTs, 2015 for HLDT/MDPVs). An alternate phase-in schedule will be acceptable if it satisfies the following conditions (where API = Anticipated Phase-In percentage for the referenced model year):

LDV/LLDTs:

$$(6 \times \text{API}_{2008}) + (5 \times \text{API}_{2009}) + (4 \times \text{API}_{2010}) + (3 \times \text{API}_{2011}) + (2 \times \text{API}_{2012}) + (1 \times \text{API}_{2013}) \geq 500\%, \text{ and } (6 \times \text{API}_{2008}) + (5 \times \text{API}_{2009}) + (4 \times \text{API}_{2010}) \geq 100\%$$

HLDT/MDPVs:

$$(6 \times \text{API}_{2010}) + (5 \times \text{API}_{2011}) + (4 \times \text{API}_{2012}) + (3 \times \text{API}_{2013}) + (2 \times \text{API}_{2014}) + (1 \times \text{API}_{2015}) \geq 500\%, \text{ and } (6 \times \text{API}_{2010}) + (5 \times \text{API}_{2011}) + (4 \times \text{API}_{2012}) \geq 100\%,$$

or

$$(6 \times \text{API}_{2010}) + (5 \times \text{API}_{2011}) + (4 \times \text{API}_{2012}) + (3 \times \text{API}_{2013}) + (2 \times \text{API}_{2014}) + (1 \times \text{API}_{2015}) \geq 600\%$$

(ii)(A) For LDV/LLDTs, if the sum of products in paragraph (g)(4)(i) of this section is greater than or equal to

500%, which is the sum of products from the primary phase-in schedule ($4 \times 25\% + 3 \times 50\% + 2 \times 75\% + 1 \times 100\% = 500\%$), then the alternate phase-in schedule is acceptable, except as prohibited in paragraphs (g)(4)(i) and (iii) of this section. In addition, manufacturers electing to use an alternate phase-in schedule for compliance with the cold temperature NMHC exhaust emission standards must ensure that the sum of products is at least 100% for model years 2010 and earlier for LDV/LLDTs. For example, a phase-in schedule for LDV/LLDTs of 5/10/10/45/80/100 that begins in 2008 would calculate as $(6 \times 5\%) + (5 \times 10\%) + (4 \times 10\%) = 120\%$ and would be acceptable for 2008–2010. The full phase-in would calculate as $(6 \times 5\%) + (5 \times 10\%) + (4 \times 10\%) + (3 \times 45\%) + (2 \times 80\%) + (1 \times 100\%) = 515\%$ and would be acceptable for 2008–2013.

(B) For HLD/MDPVs, if the sum of products in paragraph (g)(4)(i) of this section is greater than or equal to 500%, which is the sum of products from the primary phase-in schedule ($4 \times 25\% + 3 \times 50\% + 2 \times 75\% + 1 \times 100\% = 500\%$), then the alternate phase-in schedule is acceptable, except as prohibited in paragraphs (g)(4)(i) and (iii) of this section. In addition, manufacturers electing to use an alternate phase-in schedule for compliance with the cold temperature NMHC exhaust emission standards must ensure that the sum of products is at least 100% for model years 2012 and earlier for HLD/MDPVs. Alternately, if the sum of products is greater than or equal to 600%, then the alternate phase-in schedule is acceptable, except as prohibited in paragraphs (g)(4)(i) and (iii) of this section. If the sum of products is greater than or equal to 600%, then there are no requirements on the sum of products for model years 2012 and earlier.

(iii) Under an alternate phase-in schedule, the projected phase-in percentage is not binding for a given model year, provided the sums of the actual phase-in percentages that occur meet the appropriate total sums as required in the equations of paragraph (g)(4)(i) of this section, and provided that 100% actual compliance is reached for the appropriate model year, either

2013 for LDV/LLDTs or 2015 for HLD/MDPVs.

(5) Manufacturers must determine compliance with required phase-in schedules as follows:

(i) Manufacturers must submit information showing compliance with all phase-in requirements of this section with their Part I applications as required by § 86.1844(d)(13).

(ii) A manufacturer electing to use any alternate phase-in schedule permitted under this section must provide in its Application for Certification for the first year in which it intends to use such a schedule, and in each succeeding year during the phase-in, the intended phase-in percentages for that model year and the remaining phase-in years along with the intended final sum of those percentages as described in paragraph (g)(4)(i) of this section. This information may be included with the information required under § 86.1844-01(d)(13). In its year end annual reports, as required under § 86.1844-01(e)(4), the manufacturer must include sufficient information so that the Administrator can verify compliance with the alternate phase-in schedule established under paragraph (g)(4)(i) of this section.

(6)(i) Sales percentages for the purpose of determining compliance with the phase-in of the cold temperature NMHC requirements must be based upon projected 50-State sales of LDV/LLDTs and HLD/MDPVs of the applicable model year by the manufacturer to the point of first sale. Such sales percentages must be rounded to the nearest 0.1 percent.

(ii) Alternatively, the manufacturer may petition the Administrator to allow actual volume produced for U.S. sales to be used in lieu of projected U.S. sales for purposes of determining compliance with the phase-in percentage requirements under this section. The manufacturer must submit its petition within 30 days of the end of the model year. For EPA to approve the use of actual volume produced for U.S. sales, the manufacturer must establish to the satisfaction of the Administrator, that actual production volume is functionally equivalent to actual sales volume of LDV/LLDTs and HLD/MDPVs sold in all 50 U.S. States.

§ 86.1811-17

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(h) through (s) [Reserved]. For guidance see § 86.1811-04.

(t) [Reserved]. For guidance see § 86.1811-09.

(u) *Cold temperature NMHC exhaust emission in-use standards for applicable phase-in models.* An interim full useful life in-use compliance standard is calculated by adding 0.1 g/mi to the FEL to which each test group is newly cer-

tified, and applies to that test group only for the model years shown in Tables S10-4 and S10-5. Otherwise, the in-use standard is the certification standard from paragraph (g)(2) of this section. The standards apply for purposes of in-use testing only and does not apply to certification or Selective Enforcement Auditing. Tables S10-4 and S10-5 follow:

TABLE S10-4—IN-USE STANDARDS FOR APPLICABLE PHASE-IN LDV/LLDTs

Model Year of Introduction	2008	2009	2010	2011	2012	2013
Models years that the interim in-use standard is available	2008 2009 2010 2011	2009 2010 2011 2012	2010 2011 2012 2013	2011 2012 2013	2012 2013 2014	2013 2014

TABLE S10-5—IN-USE STANDARDS FOR APPLICABLE PHASE-IN HLDV/MDPVs

Model Year of Introduction	2010	2011	2012	2013	2014	2015
Models years that the interim in-use standard is available	2010 2011 2012 2013	2011 2012 2013 2014	2012 2013 2014 2015	2013 2014 2015	2014 2015 2016	2015 2016

[72 FR 8564, Feb. 26, 2007]

§ 86.1811-17 Exhaust emission standards for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles.

(a) *Applicability and general provisions.* This section describes exhaust emission standards that apply for model year 2017 and later light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles. MDPVs are subject to all the same provisions of this section that apply to LDV4. Some of the provisions of this section also apply to heavy-duty vehicles as specified in § 86.1816. See § 86.1818 for greenhouse gas emission standards. See § 86.1813 for evaporative and refueling emission standards. This section may apply to vehicles from model years earlier than 2017 as specified in paragraph (b)(11) of this section.

(b) *Tier 3 exhaust emission standards.* Exhaust emissions may not exceed the Tier 3 exhaust emission standards, as follows:

(1) Measure emissions using the chassis dynamometer procedures of 40 CFR part 1066, as follows:

(i) Establish appropriate load settings based on loaded vehicle weight (see § 86.1803).

(ii) Use appropriate driving schedules. Measurements involve testing over multiple driving schedules. The Federal Test Procedure (FTP) is based on testing with the Urban Dynamometer Driving Schedule (UDDS). The Supplemental Federal Test Procedure (SFTP) involves testing with the UDDS, the US06 driving schedule, and the SC03 driving schedule. See 40 CFR 1066.801 for further information on these test cycles.

(iii) Calculate SFTP emissions as a composite of test results over the driving schedules identified in paragraph (b)(1)(ii) of this section based on the following calculation:

$$\text{SFTP (g/mi)} = 0.35 \times \text{FTP} + 0.28 \times \text{US06} + 0.37 \times \text{SC03}$$

(A) For test vehicles that do not have air conditioning, you may omit SC03 testing. To calculate composite SFTP emissions for such vehicles, use FTP emission results to substitute for the SC03 value in the equation.

(B) You may also use FTP emission results to substitute for the SC03 value

in the equation for the types of vehicles identified in 40 CFR 600.115 that automatically qualify for the derived 5-cycle method for determining fuel economy label values. Such vehicles remain subject to the SFTP standard when tested over the SC03 driving schedule. Other vehicles remain subject to the litmus-test provisions in 40 CFR 600.115.

(iv) Use E10 test fuel as required in § 86.113, except as specified in this section.

(v) Hydrocarbon emission standards are expressed as NMOG; however, for certain vehicles you may measure exhaust emissions based on nonmethane hydrocarbon instead of NMOG as described in 40 CFR 1066.635.

(vi) Measure emissions from hybrid electric vehicles (including plug-in hy-

brid electric vehicles) as described in 40 CFR part 1066, subpart F, except that these procedures do not apply for plug-in hybrid electric vehicles during charge-depleting operation.

(2) Table 1 of this section describes fully phased-in Tier 3 standards that apply as specified in this paragraph (b) for the identified driving schedules. The FTP standards for NMOG+NO_x apply on a fleet-average basis using discrete bin standards as described in paragraph (b)(4) of this section. The bin standards include additional emission standards for high-altitude testing and for CO emissions when testing over the FTP driving schedule. The SFTP standards for NMOG+NO_x apply on a fleet-average basis as described in paragraph (b)(5) of this section. Table 1 follows:

TABLE 1 OF § 86.1811–17—FULLY PHASED-IN TIER 3 EXHAUST EMISSION STANDARDS

[g/mile]					
NMOG+NO _x		PM		CO	Formaldehyde
FTP ¹	SFTP	FTP	US06	SFTP	FTP
0.030	0.050	0.003	0.006	4.2	0.004

¹ The fleet-average FTP emission standard for NMOG+NO_x is 0.026 g/mile for any LDV or LDT1 test group certified to standards based on a useful life of 120,000 miles or 10 years in a given model year.

(3) The FTP standards specified in this section apply for testing at low-altitude conditions and high-altitude conditions as specified in paragraph (b)(4) of this section. The SFTP standards specified in paragraph (b)(2) of this section apply only for testing at low-altitude conditions.

(4) The FTP emission standard for NMOG+NO_x is based on a fleet average for a given model year. You must specify a family emission limit (FEL) for each test group. The FEL serves as the emission standard for the test group with respect to all required FTP testing. Calculate your fleet-average emission level as described in § 86.1860 based on the FEL that applies for low-altitude testing to show that you meet the specified standard. For multi-fueled vehicles, calculate fleet-average emission levels based only on emission levels for testing with gasoline or diesel fuel. You may generate emission credits for banking and trading and you may use

banked or traded credits as described in § 86.1861 for demonstrating compliance with the FTP emission standard for NMOG+NO_x. You comply with the emission standard for a given model year if you have enough credits to show that your fleet-average emission level is at or below the applicable standard. You may exchange FTP credits between or among any test groups subject to standards under this section. You may not exchange FTP and SFTP credits.

(i) Specify one of the identified values from Table 2 of this section as the FEL for demonstrating that your fleet-average emission level complies with the FTP emission standard for NMOG+NO_x under low-altitude conditions. These FEL values define emission bins that also determine corresponding emission standards for NMOG+NO_x emissions under high-altitude conditions, and for CO emissions, as follows:

TABLE 2 OF § 86.1811-17—TIER 3 FTP BIN STANDARDS

[g/mile]			
FEL Name	NMOG+NO _x FELs for low altitude	NMOG+NO _x for high altitude	CO for low and high altitude
Bin 160	0.160	0.160	4.2
Bin 125	0.125	0.160	2.1
Bin 70	0.070	0.105	1.7
Bin 50	0.050	0.070	1.7
Bin 30	0.030	0.050	1.0
Bin 20	0.020	0.030	1.0
Bin 0	0.000	0.000	0.0

(ii) Manufacturers earn a compliance credit of 0.005 g/mile NMOG+NO_x for vehicles that are certified for a useful life of 150,000 miles or 15 years and that are covered by an extended warranty over the same period for all components whose failure triggers MIL illumination. Manufacturers may apply the compliance credit as follows:

(A) You may reduce your official FTP emission result for certification by the amount of the compliance credit if that allows you to certify to a more stringent bin. In that case, you may use the more stringent bin standard for calculating the fleet-average NMOG+NO_x emission level. For any compliance testing with these vehicles, the applicable FTP bin standard for NMOG+NO_x is higher than the specified bin standard by the amount of the compliance credit. For example, if the official FTP emission result for NMOG+NO_x is 0.052 g/mile, this qualifies for an FEL of 0.050 g/mile for calculating the fleet average and the vehicle is subject to an FTP bin standard of 0.055 g/mile.

(B) If the amount of the compliance credit does not allow you to certify to a more stringent bin, calculate the fleet-average NMOG+NO_x emission level using an FEL for these vehicles that is smaller than the bin standard by the amount of the compliance credit. For any compliance testing with these vehicles, the specified bin standard applies. For example, if the official FTP emission result for NMOG+NO_x is 0.038 g/mile, calculate the fleet-average NMOG+NO_x emission level by specifying an FEL of 0.045 g/mile; these vehicles are subject to the specified FTP bin standard of 0.050 g/mile.

(iii) If you qualify for a compliance credit for direct ozone reduction under

the LEV III program, you may apply the compliance credit approved for California vehicles as described in paragraphs (b)(4)(ii)(A) and (B) of this section.

(iv) You may combine the adjustments in paragraphs (b)(4)(ii) and (iii) of this section if you qualify for them separately.

(5) The SFTP emission standard for NMOG+NO_x is also based on a fleet average in a given model year. You must specify FELs as described in paragraph (b)(4) of this section and calculate a fleet-average emission level to show that you meet the SFTP emission standard for NMOG+NO_x, except that you may specify FELs in any even increment of 0.010 g/mile up to a maximum value of 0.180 g/mile. You may generate emission credits for banking and trading and you may use banked or traded credits as described in § 86.1861 for demonstrating compliance with the SFTP emission standard for NMOG+NO_x. You comply with the emission standard for a given model year if you have enough credits to show that your fleet-average emission level is at or below the applicable standard. You may exchange SFTP credits between or among any test groups subject to standards under this section. You may not exchange FTP and SFTP credits. The SFTP standards described in this section apply only for testing at low-altitude conditions.

(6) The full Tier 3 program includes new emission standards for NMOG+NO_x, PM, CO, and formaldehyde; it also includes measurement with a new test fuel and a longer useful life (for some vehicles). Vehicles meeting all these requirements are considered Final Tier 3 vehicles. Vehicles

that do not meet all the Tier 3 requirements are considered Interim Tier 3 vehicles. Paragraphs (b)(7) through (13) of this section describe how to comply with standards during a phase-in period.

(7) The Tier 3 PM standards phase in over several years. The following provisions describe the primary approach for phasing in the Tier 3 PM standards:

(i) You must meet the FTP and the US06 PM standards with 20, 20, 40, 70, and 100 percent of your projected nationwide sales of all vehicles subject to this section in model years 2017 through 2021, respectively. In model years 2017 and 2018, an interim US06 PM standard of 0.010 g/mile applies. Each vehicle meeting the Tier 3 FTP standard for PM must also meet the Tier 3 US06 standard for PM. In model year 2017, the phase-in requirement applies only for vehicles at or below 6,000 pounds GVWR; however, you may meet an alternative phase-in requirement of 10 percent in model year 2017 based on your full production of vehicles subject to standards under this section.

(ii) You may disregard the phase-in percentages specified in paragraph (b)(7)(i) of this section if you instead comply with an indexed PM phase-in schedule as described in this paragraph (b)(7)(ii). To do this, you must notify us of your intent before January 1, 2017, and include a detailed plan for complying with the indexed phase-in schedule. You comply with the indexed phase-in schedule by calculating a PM phase-in index at or above 540 using the following equation for model years 2017 through 2021:

$$\text{PM phase-in index} = 5 \cdot \text{APP}_{2017} + 4 \cdot \text{APP}_{2018} + 3 \cdot \text{APP}_{2019} + 2 \cdot \text{APP}_{2020} + \text{APP}_{2021}$$

Where:

APP = The phase-in percentage of vehicles meeting the Tier 3 PM standards for the indicated model year, based on actual sales, as described in paragraph (b)(7)(i) of this section.

(iii) Vehicles meeting the Tier 3 PM standards must meet those standards over the useful life as specified in § 86.1805. Note that Interim Tier 3 vehicles may have different useful life values for PM emission standards than for other emission standards.

(iv) Any vehicles not included for demonstrating compliance with the Tier 3 PM phase-in requirement must instead comply with an FTP emission standard for PM of 0.010 g/mile, and a composite SFTP emission standard for PM of 0.070 g/mile.

(v) Measure PM emissions from all vehicles using the same test fuel specified in paragraph (b)(8) of this section for measuring NMOG+NO_x emissions.

(vi) You may certify Interim Tier 3 vehicles based on carryover data.

(vii) You may use the alternative phase-in provisions described in paragraph (b)(9) of this section to transition to the Tier 3 exhaust emission standards on a different schedule.

(8) The following provisions describe the primary approach for phasing in the Tier 3 standards other than PM in 2025 and earlier model years:

(i) *FTP phase-in.* The fleet-average FTP emission standard for NMOG+NO_x phases in over several years as described in this paragraph (b)(8)(i). You must identify FELs as described in paragraph (b)(4) of this section and calculate a fleet-average emission level to show that you meet the FTP emission standard for NMOG+NO_x that applies for each model year. For model year 2017, do not include vehicles above 6,000 pounds GVWR. Through model year 2019, you may also certify to transitional Bin 85 or Bin 110 standards, which consist of all-altitude FTP emission standards for NMOG+NO_x of 0.085 or 0.110 g/mile, respectively; additional FTP standards for PM, CO, and formaldehyde apply as specified in this section for vehicles certified to Bin 125 standards. Fleet-average FTP emission standards decrease through the phase-in period as shown in the following table:

TABLE 3 OF § 86.1811–17—DECLINING FLEET-AVERAGE TIER 3 FTP EMISSION STANDARDS FOR NMOG+NO_x

Model year	[g/mile]	
	LDV, LDT1 ¹	LDT2, HLDLT
2017 ²	0.086	0.101
2018	0.079	0.092
2019	0.072	0.083
2020	0.065	0.074
2021	0.058	0.065
2022	0.051	0.056
2023	0.044	0.047
2024	0.037	0.038

TABLE 3 OF § 86.1811-17—DECLINING FLEET-AVERAGE TIER 3 FTP EMISSION STANDARDS FOR NMOG+NO_x—Continued
[g/mile]

Model year	LDV, LDT1 ¹	LDT2, HLDLT
2025	0.030	0.030

¹ Calculate the adjusted fleet-average standard for LDV and LDT1 test groups certified to standards based on a useful life of 120,000 miles or 10 years in a given model year by multiplying the specified value by 0.85 and rounding to the nearest 0.001 g/mile. Through model year 2019, apply this adjustment only if one or more test groups is certified to Bin 70 or lower standards based on a useful life of 120,000 miles or 10 years.

² Vehicles above 6,000 pounds GVWR must meet the Tier 3 standards starting with model year 2018.

(ii) *SFTP phase-in.* The fleet-average SFTP emission standard for NMOG+NO_x phases in over several years as described in this paragraph (b)(8)(ii). You must identify FELs as described in paragraph (b)(5) of this section and calculate a fleet-average emission level to show that you meet the SFTP emission standard for NMOG+NO_x that applies for each model year.

(A) Calculate the fleet-average emission level together for all your light-duty vehicles and light-duty trucks, except for those certified using the provisions of paragraph (b)(8)(ii)(C) of this section. For model year 2017, do not include vehicles above 6,000 pounds GVWR (in the numerator or denominator).

(B) Fleet-average FTP emission standards decrease through the phase-in period as shown in the following table:

TABLE 4 OF § 86.1811-17—DECLINING FLEET-AVERAGE TIER 3 SFTP EMISSION STANDARDS

Model year	NMOG+NO _x (g/mile)
2017 ¹	0.103
2018	0.097
2019	0.090
2020	0.083
2021	0.077
2022	0.070
2023	0.063
2024	0.057
2025	0.050

¹ Vehicles above 6,000 pounds GVWR must meet the Tier 3 standards starting with model year 2018.

(C) You may use the Option 1 provisions specified in the LEV III program to demonstrate compliance with EPA's SFTP standards. Do not include any such test groups when demonstrating compliance with the phased-in fleet-average

SFTP standards specified in this paragraph (b)(8)(ii). Note that this option is not available for vehicles certified to the transitional bins described in paragraph (b)(8)(i) of this section.

(iii) *Interim provisions.* (A) For LDT2 and HLDLT certified to bins higher than Bin 70 under this section through model year 2019, the Tier 2 useful life period applies as specified in § 86.1805-12 for all criteria pollutants other than PM. A similar provisions applies for LDV and LDT1, as described in Table 3 of this section.

(B) You may use the E0 test fuel specified in § 86.113 through model year 2019 for gasoline-fueled vehicles certified to bins higher than Bin 70. You may not certify these vehicles using carryover data after model year 2019.

(iv) You may use the alternative phase-in provisions described in paragraph (b)(9) of this section to transition to the Tier 3 exhaust emission standards on a different schedule.

(9) This paragraph (b)(9) describes an alternative approach to phasing in the Tier 3 emission standards for vehicles above 6,000 pounds GVWR. If you choose this approach, you must phase in the Tier 3 standards for all your vehicles above 6,000 pounds GVWR that are subject to this section according to this schedule. Under this alternative phase-in, you must meet the fully phased-in standards specified in this paragraph (b) with 40, 70, and 100 percent of your projected nationwide sales of all vehicles above 6,000 pounds GVWR that are subject to this section in model years 2019 through 2021, respectively. Any vehicles not subject to Tier 3 standards during the phase-in period must continue to comply with the Tier 2 standards in § 86.1811-04(c) and (f), including the Tier 2 SFTP emission standards for NMHC+NO_x and CO for 4,000-mile testing as specified in § 86.1811-04(f)(1). Vehicles subject to Tier 2 standards under this paragraph (b)(9) are subject to the useful life provisions in § 86.1805-12 relative to exhaust emission standards. Each vehicle counting toward the phase-in percentage under this paragraph (b)(9) must meet all the standards that apply throughout the useful life as specified in § 86.1805-17, and must use the Tier 3

test fuel specified in § 86.113-07. The following exceptions and special provisions apply under this paragraph (b)(9):

(i) For model year 2019, you may exclude from the phase-in calculation any test groups with vehicles above 6,000 pounds GVWR that have a Job 1 date on or before March 3, 2018 (see 40 CFR 85.2304).

(ii) The FTP and SFTP emission standards for NMOG+NO_x are fleet-average standards. Calculate your fleet-average values based on all the vehicles that are subject to the standard in a given year. You may not generate credits for banking or trading in model years 2019 or 2020, and you may not use banked or traded credits to demonstrate compliance with the standards in those years.

(iii) The US06 emission standard for PM is 0.010 g/mile in model years 2019 through 2021, and 0.006 g/mile starting in model year 2022. The other standards described in this paragraph (b)(9) apply to all your vehicles above 6,000 pounds GVWR in model years 2022 through 2024.

(10) You may not use credits generated from Tier 2 vehicles for demonstrating compliance with the Tier 3 standards except as specified in this paragraph (b)(10). You may generate early credits with U.S. sales of Tier 2 vehicles in the two model years before the Tier 3 standards start to apply for a given vehicle model. Vehicles certified to the Tier 2 standards must meet all the Tier 2 requirements in § 86.1811-10, including the fleet-average Tier 2 standards. Calculate early Tier 3 emission credits as described in § 86.1861 by subtracting the appropriate Tier 2 fleet-average value for FTP emissions of NMOG+NO_x from 0.160 g/mile. Calculate your fleet-average value for the model year based on vehicles at or below 6,000 pounds GVWR in 2015, on all sizes of vehicles in 2016, and on vehicles above 6,000 pounds GVWR in 2017. You may use these early credits as described in § 86.1861 for demonstrating compliance with the FTP emission standard for NMOG+NO_x starting in model year 2017. For model years 2018 and later, you may use these early credits for banking or trading subject to a limitation based on credits generated in California, as follows:

(i) For the applicable model years in which you generate emission credits relative to California's LEV III fleet-average NMOG+NO_x standard, determine the actual California sales of light-duty vehicles and light-duty trucks and the actual nationwide sales of those same vehicles. In 2015, count sales only from vehicle models at or below 6,000 pounds GVWR. For each model year, multiply the credits generated under the California program by the ratio of nationwide vehicle sales to LEV III vehicle sales to calculate an effective nationwide quantity. Sum these results for model years 2015 through 2017. Note that this calculation results in a maximum credit quantity based on vehicle sales in all states, even though the initial credit calculation does not include vehicle sales in California or the section 177 states. If you comply with the LEV III standards based on pooled emission credits for California and the section 177 states, use those pooled emission credits and corresponding sales for calculating the maximum credit quantity under this paragraph (b)(10)(i).

(ii) You may not use more early credits generated under this paragraph (b)(10) for banking or trading to demonstrate compliance with Tier 3 emission standards than the calculated value of the effective nationwide credit quantity summed in paragraph (b)(10)(i) of this section. If your generated credits are greater than this threshold, determine the percentage of your generated early credits that exceed the threshold. Calculate an adjusted quantity of early credits generated under this paragraph (b)(10) by decreasing the generated quantity from each model year by the calculated percentage that exceed the applicable threshold. This adjusted quantity of credits may be used for banking or trading relative to the Tier 3 standards, subject to the five-year credit life described in § 86.1861.

(11) You may certify vehicles to the Tier 3 standards starting in model year 2015. To do this, you may either sell all your LEV III vehicles models nationwide, or you may certify a subset of your fleet to alternate fleet-average emission standards as follows:

(i) The alternate fleet-average FTP emission standards for NMOG+NO_x are 0.100 g/mile in 2015 and 0.093 g/mile in 2016 for LDV and LDT1.

(ii) The alternate fleet-average FTP emission standards for NMOG+NO_x are 0.119 g/mile in 2015, 0.110 g/mile in 2016, and 0.101 g/mile in 2017 for LDT2 and HLDT.

(iii) The alternate fleet-average SFTP emission standards for NMOG+NO_x are 0.140 in 2015 for LDV and LDT1, 0.110 in 2016 for all vehicles, and 0.103 in 2017 for LDT2 and HLDT.

(iv) The vehicles must meet FTP and SFTP standards for PM as specified in § 86.1811-04. The PM testing provisions of § 86.1829-01(b)(1)(iii)(B) apply for these vehicles.

(v) Vehicles not certified to the Tier 3 standards in a given model year must meet all the requirements that apply for Tier 2 vehicles in that model year.

(vi) For cold temperature testing and for high-altitude testing, you may use the E0 fuel specified in § 86.113-04(a) or § 86.213 instead of the E10 test fuel specified in § 86.113-07.

(vii) For vehicles certified under this paragraph (b)(11), you may generate emission credits and use those credits for demonstrating compliance with Tier 3 standards as described in paragraph (b)(10) of this section.

(12) The following alternate standards apply for in-use testing:

(i) Alternate in-use FTP standards for NMOG+NO_x apply for 2021 and earlier model year vehicles certified to Bin 70 and lower. Calculate these alternate standards by multiplying the applicable FEL by 1.4. These alternate standards apply only for testing at low-altitude conditions.

(ii) The alternate in-use FTP standard for PM is 0.006 g/mile for 2021 and earlier model year vehicles.

(iii) The in-use US06 standard for PM is 0.010 g/mile for 2023 and earlier model year vehicles.

(13) Keep records as needed to show that you meet the requirements specified in this paragraph (b) for phasing in standards and for complying with declining fleet-average average standards.

(c) *Highway NMOG+NO_x exhaust emission standard.* NMOG+NO_x emissions measured on the federal Highway Fuel

Economy Test in 40 CFR part 600, subpart B, may not exceed the applicable FTP bin standard for NMOG+NO_x. Demonstrate compliance with this standard for low-mileage vehicles by applying the appropriate deterioration factor. For vehicles not certified to any Tier 3 emission standards specified in paragraph (b) of this section, the provisions of § 86.1811-04(j) apply instead of this paragraph (c).

(d) *Special provisions for Otto-cycle engines.* The special provisions described in this paragraph (d) apply for vehicles with Otto-cycle engines. For vehicles not certified to any Tier 3 emission standards, the provisions of § 86.1810-01(i)(6), (i)(13), and (i)(14) apply instead of this paragraph (d).

(1) *Enrichment limits.* The nominal air-fuel ratio throughout the US06 cycle may not be richer than the leanest air-fuel mixture required for lean best torque, except as allowed under paragraph (d)(2) of this section. Unless we approve otherwise in advance, lean best torque is the leanest air-fuel ratio required at any speed and load point with a fixed spark advance to make peak torque. The allowable tolerance around the nominal value for any given speed and load point over the US06 cycle for a particular vehicle is 4 percent, which is calculated as the nominal mass-based air-fuel ratio for lean best torque divided by 1.04.

(2) *Engine protection.* AECDs that use commanded enrichment to protect the engine or emission control hardware must not use enrichment more frequently or to a greater degree than is needed for this purpose. For purposes of this section, commanded enrichment includes intended engine operation at air-fuel ratios rich of stoichiometry, except the following:

(i) Cycling back and forth in a narrow window between rich and lean operation as a result of feedback controls targeted to maintain overall engine operation at stoichiometry.

(ii) Small changes in the target air-fuel ratio to optimize vehicle emissions or drivability. This may be called "closed-loop biasing."

(iii) Temporary enrichment in response to rapid throttle motion.

(iv) Enrichment during cold-start and warm-up conditions.

(v) Temporary enrichment for running OBD checks to comply with § 86.1806.

(3) *A/C-on specific calibrations.* (i) A/C-on specific calibrations (e.g., air-fuel ratio, spark timing, and exhaust gas recirculation) that differ from A/C-off calibrations may be used for a given set of engine operating conditions (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters). Such calibrations must not unnecessarily reduce emission control effectiveness during A/C-on operation when the vehicle is operated under conditions that may reasonably be expected during normal operation and use. If emission control effectiveness decreases as a result of such calibrations, the manufacturer must describe in the Application for Certification the circumstances under which this occurs and the reason for using these calibrations.

(ii) For AECs involving commanded enrichment, these AECs must not operate differently for A/C-on operation than for A/C-off operation, except as provided under paragraph (d)(2) of this section. This includes both the sensor inputs for triggering enrichment and the degree of enrichment employed.

(4) *“Lean-on-cruise” calibration strategies.* Manufacturers may use “lean-on-cruise” strategies subject to the following specifications:

(i) A “lean-on-cruise” strategy is defined as the use of an air-fuel ratio significantly leaner than stoichiometry during non-deceleration conditions at speeds above 40 mph.

(ii) You must not employ “lean-on-cruise” strategies during vehicle operation in normal driving conditions, including A/C usage, unless at least one of the following conditions is met:

(A) Such strategies are substantially employed during the FTP, US06, or SC03 duty cycle.

(B) Such strategies are demonstrated not to significantly reduce vehicle emission control effectiveness over the operating conditions in which they are employed.

(C) Such strategies are demonstrated to be necessary to protect the vehicle occupants, engine, or emission control hardware.

(iii) If you propose to use a “lean-on-cruise” strategy, you must describe in the application for certification the circumstances under which such a calibration would be used and the reasons for using it.

(e) through (f) [Reserved]

(g) *Cold temperature exhaust emission standards.* The following standards apply for vehicles tested over the test procedures specified in subpart C of this part:

(1) *Cold temperature CO standards.* These cold temperature CO standards are applicable only to gasoline-fueled vehicles. These standards apply for testing at low-altitude conditions and high-altitude conditions. Cold temperature CO exhaust emission standards apply when measured using the test procedures specified in subpart C of this part, as follows:

(i) For LDV and LDT1, the standard is 10.0 g/mile CO.

(ii) For LDT2, LDT3 and LDT4, the standard is 12.5 grams per mile CO.

(2) *Cold temperature NMHC standards.* Fleet average cold temperature NMHC standards are applicable only to gasoline-fueled vehicles, and apply equally to certification and in-use except as otherwise specified in § 86.1811-10(u) for in-use standards for applicable phase-in models. Testing with other fuels such as a high-level ethanol-gasoline blend, or testing on diesel vehicles, is not required. Multi-fuel, bi-fuel or dual-fuel vehicles must comply with requirements using gasoline only.

(i) The standards are shown in the following table:

TABLE 5 OF § 86.1811-17—FLEET AVERAGE COLD TEMPERATURE NMHC EXHAUST EMISSION STANDARDS

Vehicle weight category	Cold temperature NMHC sales-weighted fleet average standard (g/mile)
LDV and LLDT	0.3
HLDT	0.5

(ii) The manufacturer must calculate its fleet average cold temperature NMHC emission level(s) as described in § 86.1864-10(m).

(iii) The standards specified in this paragraph (g)(2) apply only for testing at low-altitude conditions. However,

manufacturers must submit an engineering evaluation indicating that common calibration approaches are utilized at high altitudes. Any deviation from low altitude emission control practices must be included in the auxiliary emission control device (AECD) descriptions submitted at certification. Any AECD specific to high altitude must require engineering emission data for EPA evaluation to quantify any emission impact and validity of the AECD.

(h) *Small-volume manufacturers.* Small-volume manufacturers may use the following Tier 3 phase-in provisions:

(1) Instead of the fleet-average FTP standards for NMOG+NO_x specified in this section, small-volume manufacturers may meet alternate fleet-average standards of 0.125 g/mile through model year 2021, and 0.051 g/mile for model years 2022 through 2027. The following additional provisions apply for vehicles certified under this paragraph (h)(1):

(i) Vehicles are subject to exhaust emission standards over the useful life as specified in § 86.1805–12 through model year 2021, and as specified in this section starting in model year 2022.

(ii) Gasoline-fueled vehicles may use the E0 test fuel specified in § 86.113–04 for vehicles certified to bins higher than Bin 70 through model year 2021.

(iii) Vehicles certified under this paragraph (h)(1) may generate emission credits and they may use banked or traded emission credits relative to the alternate fleet-average FTP standard for NMOG+NO_x only in model years 2022 through 2027.

(iv) Vehicles are subject to all the other requirements specified in this section.

(2) Small-volume manufacturers may delay complying with all the requirements of this section until model year 2022, and instead meet all the requirements that apply to Tier 2 vehicles under § 86.1811–10 for 2021 and earlier model years.

(3) If meeting the Tier 3 standards would cause severe economic hardship, small-volume manufacturers may ask us to approve an extended compliance deadline under the provisions of 40 CFR 1068.250, except that the solvency criterion does not apply and there is no

maximum duration of the hardship relief.

[79 FR 23713, Apr. 28, 2014]

§ 86.1813–17 Evaporative and refueling emission standards.

Vehicles must meet evaporative and refueling emission standards as specified in this section. These standards apply for heavy duty vehicles above 14,000 pounds GVWR as specified in § 86.1801. The emission standards apply for total hydrocarbon equivalent (THCE) measurements using the test procedures specified in subpart B of this part, as appropriate. Note that § 86.1829 allows you to certify without testing in certain circumstances. Except as specified in paragraph (b) of this section, evaporative and refueling emission standards do not apply for diesel-fueled vehicles. Unless otherwise specified, MDPVs are subject to all the same provisions of this section that apply to LDT4.

(a) *Tier 3 evaporative emission standards.* Vehicles may not exceed the Tier 3 evaporative emission standards, as follows:

(1) Measure emissions using the test procedures of subpart B of this part, as follows:

(i) Follow the vehicle preconditioning and exhaust testing procedures as described in subpart B of this part.

(ii) Measure diurnal, running loss, and hot soak emissions as shown in § 86.130. This includes separate measurements for the two-diurnal test sequence and the three-diurnal test sequence; however, gaseous-fueled vehicles are not subject to evaporative emission standards using the two-diurnal test sequence.

(iii) For gasoline-fueled vehicles, use E10 test fuel as required in § 86.113, except as specified in this section.

(iv) Emissions are generally measured with a flame ionization detector (FID). In the case of diurnal, hot soak, and running loss testing with E10 test fuel, multiply measured (unspeciated) FID values by 1.08 to account for the FID's reduced response to ethanol. You may instead determine total hydrocarbon equivalent for E10 testing based on speciated measurements as described in § 86.143–96(c). You must use

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the same method (with or without speciation) for all of the specified evaporative testing for a given evaporative/refueling family. Similarly, any evaporative/refueling families certified in later model years using carryover data must use the same method that was used for the original testing. We may do testing with or without speciation, but we will apply the 1.08 correction factor to unspiciated measurements only if you also use it to determine your final test results.

(2) Diurnal and hot soak emissions may not exceed the Tier 3 emission standards, as follows:

(i) The emission standard for the sum of diurnal and hot soak measurements from the two- diurnal test sequence and the three- diurnal test sequence is based on a fleet average in a given model year. You must specify a family emission limit (FEL) for each evaporative family. The FEL serves as the emission standard for the evaporative family with respect to all required diurnal and hot soak testing. Calculate your fleet average emission level as described in § 86.1860 based on the FEL that applies for low-altitude testing to show that you meet the specified standard. For multi-fueled vehicles, calculate fleet-average emission levels based only on emission levels for testing with gasoline. You may generate emission credits for banking and trading and you may use banked or traded credits for demonstrating compliance with the diurnal plus hot soak emission standard for vehicles required to meet the Tier 3 standards, other than electric vehicles and gaseous-fueled vehicles, as described in § 86.1861 starting in model year 2017. You comply with the emission standard for a given model year if you have enough credits to show that your fleet-average emission level is at or below the applicable standard. You may exchange credits between or among evaporative families within an averaging set as described in § 86.1861. Separate diurnal plus hot soak emission standards apply as shown for high-altitude conditions. The sum of diurnal and hot soak measurements may not exceed the following fleet-average Tier 3 standards:

TABLE 1 OF § 86.1813–17—TIER 3 DIURNAL PLUS HOT SOAK EMISSION STANDARDS (GRAMS PER TEST)

Vehicle category	Low-altitude conditions	High-altitude conditions
LDV, LDT1	0.300	0.65
LDT2	0.400	0.85
HLDT	0.500	1.15 ¹
HDV	0.600	1.75

¹ 1.25 g/test for MDPVs.

(ii) Specify FELs as follows:

(A) You may specify the low-altitude FEL in increments of 0.025 g above or below the otherwise applicable Tier 3 diurnal plus hot soak standard, up to the maximum values specified in the following table:

TABLE 2 OF § 86.1813–17—TIER 3 FEL CAPS FOR LOW-ALTITUDE TESTING

Vehicle category	FEL Caps
LDV	0.500
LLDT	0.650
HLDT	0.900
MDPV	1.000
HDV	1.4

(B) Calculate the FEL for testing at high-altitude conditions based on the difference between the low-altitude FEL and the standard. For example, if a light-duty vehicle was certified with an FEL of 0.400 g instead of the 0.300 g standard, the FEL for testing under high-altitude conditions would be 0.75 g (0.65+0.10).

(iii) Hydrocarbon emissions must not exceed 0.020 g for LDV and LDT and 0.030 g for HDV when tested using the Bleed Emission Test Procedure adopted by the California Air Resources Board as part of the LEV III program. This procedure quantifies diurnal emissions without measuring hot soak emissions. The standards in this paragraph (a)(2)(iii) do not apply for testing at high-altitude conditions. For vehicles with non-integrated refueling canisters, the bleed emission test and standard do not apply to the refueling canister. You may perform the Bleed Emission Test Procedure using the analogous test temperatures and the E10 test fuel specified in subpart B of this part.

(3) Running losses may not exceed 0.05 g per mile when measured using the test procedures specified in § 86.134.

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This standard does not apply for gas-eous-fueled vehicles.

(4) Fuel systems for vehicles operating on one or more volatile liquid fuels may not exceed an effective leak diameter of 0.02 inches when measured using the procedure specified in 40 CFR 1066.985. For vehicles with fuel tanks exceeding 25 gallons nominal fuel tank capacity, you may request our approval for a leak standard greater than 0.020 inches, up to a maximum value of 0.040 inches.

(5) The Tier 3 evaporative emission standards start to phase in with model year 2017 for vehicles at or below 6,000 pounds GVWR and with model year 2018 for vehicles above 6,000 pounds GVWR. Table 3 of this section specifies the minimum percentage of each manufacturer's sales in each model year that must be certified to the Tier 3 evaporative emission standards. Calculate annual percentages based on actual nationwide sales of all vehicles subject to standards under this paragraph (a) for the applicable model year; however, if all your FELs for Tier 3 evaporative families are at the applicable standard (neither generating nor using emission credits), the phase-in requirements are based on projected sales. Also, if you certify vehicles above 6,000 pounds GVWR to the Tier 3 evaporative emission standards in model year 2017, you may count projected U.S. sales of those vehicles toward your calculation for meeting the 40 percent requirement in 2017 (numerator only). Manufacturers may meet this requirement using the additional alternative phase-in provisions in paragraph (g) of this section. Vehicles from the identified model years not certified to the Tier 3 evaporative emission standards continue to be subject to the evaporative emission standards specified in § 86.1811–09(e) or § 86.1816–08(d), including the useful life provisions of § 86.1805–12. Note that this subjects LDV and LDT1 to a 150,000 mile useful life for evaporative emissions if the vehicles are subject to a 150,000 mile useful life for exhaust emissions. Keep records as needed to show that you meet the phase-in requirements specified in this section. See paragraph (g) of this section for additional provisions that apply for

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model year 2017 and the rest of the phase-in.

TABLE 3 OF § 86.1813–17—DEFAULT PHASE-IN SCHEDULE FOR TIER 3 EVAPORATIVE EMISSION STANDARDS

Model year	Minimum percentage of vehicles subject to the Tier 3 standards
2017	40 ^{1,2}
2018	60
2019	60
2020	80
2021	80
2022	100

¹ The phase-in percentage for model year 2017 applies only for vehicles at or below 6,000 pounds GVWR.

² The leak standard specified in paragraph (a)(4) of this section does not apply for model year 2017.

(6) For model year 2017, exclude vehicle sales from California and section 177 states from the calculation to demonstrate compliance with the phase-in schedule in paragraph (a)(5) or (g) of this section, and from the credit calculation in § 86.1860.

(b) *Refueling emissions.* Light-duty vehicles, light-duty trucks, and complete heavy-duty vehicles must meet the refueling emission standards in this paragraph (b) when measured over the procedure specified in § 86.150. These standards apply starting with model year 2018 for vehicles above 10,000 pounds GVWR. The following refueling standards apply:

(1) 0.20 g THCE per gallon of fuel dispensed for vehicles using volatile liquid fuels. This standard also applies for diesel-fueled LDV.

(2) 0.15 g THC per gallon of fuel dispensed for liquefied petroleum gas-fueled vehicles and natural gas-fueled vehicles.

(c) *Fuel spitback.* For vehicles fueled by volatile liquid fuels, fuel spitback emissions may not exceed 1.0 g THCE when measured using the test procedures specified in § 86.146. The fuel spitback standard applies only to newly assembled vehicles.

(d) [Reserved]

(e) *Auxiliary engines and separate fuel systems.* The provisions of 40 CFR 1037.103(g) apply for vehicles with auxiliary engines. This includes any engines installed in the final vehicle configuration that contribute no motive

power through the vehicle's transmission.

(f) *Refueling provisions for gaseous-fueled vehicles.* The following provisions apply specifically for gaseous-fueled vehicles:

(1) Compressed natural gas vehicles must meet the requirements for fueling connection devices as specified in ANSI NGV1-2006 (incorporated by reference in § 86.1).

(2) [Reserved]

(3) With our advance approval, liquefied petroleum gas-fueled vehicles with gauges or valves that can be opened to release fuel or fuel vapor during refueling (such as fixed liquid level gauges) may be tested for refueling emissions without opening such gauges or valves, as outlined in § 86.157-98(d)(2). We will approve your request if you can show that such gauges or valves will not be open during in-use refueling due to inaccessibility or other design features that would prevent them from opening or make this very unlikely.

(g) *Alternative phase-in options for Tier 3 evaporative emission standards.* You may use any of the following alternative methods to transition to the Tier 3 evaporative emission standards:

(1) Starting in model year 2015, you may earn an "allowance" for each vehicle that you certify early under this paragraph (g)(1). For each allowance you earn, you may count it as one compliant vehicle in a later model year during the phase-in period. Calculate the total phase-in percentage in each model year by adding the allowances to the number of compliant vehicles (in the numerator), without increasing total sales (in the denominator). For each allowance you earn, you may alternatively count it as one compliant vehicle under the phase-in schedule described in paragraph (g)(5) of this section, except that you may not use those allowances to increase the value of the phase-in index from any model year by more than 10 percentage points. Vehicles earning allowances under this paragraph (g)(1) may not have an FEL above the applicable Tier 3 standard, and may not generate emission credits for banking or trading. Allowances may not be traded to another company. You may earn allowances

under this paragraph (g)(1) for early-compliant vehicles as follows:

(i) Model year 2015 and 2016 vehicles at or below 6,000 pounds GVWR meeting the Tier 3 standards in paragraph (a) of this section or the equivalent California standards as specified in paragraph (g)(4) of this section earn allowances, as long as the vehicles are not sold in California or any of the section 177 states.

(ii) Model year 2015 through 2017 LDV and LDT above 6,000 pounds GVWR meeting the Tier 3 standards in paragraph (a) of this section or the equivalent California standards as specified in paragraph (g)(4) of this section earn allowances, as long as the vehicles are not sold in California or any of the section 177 states.

(iii) Model year 2015 through 2017 MDPV and HDV meeting the Tier 3 standards in paragraph (a) of this section or the equivalent California standards as specified in paragraph (g)(4) of this section earn allowances for vehicles sold in any state.

(iv) To the extent that you over-comply with the 40-percent phase-in requirement in model year 2017, you may count your actual U.S. sales exceeding the required number of Tier 3 vehicles as allowances toward meeting the phase-in requirement in 2018 and later model years.

(v) For HDV above 10,000 pounds GVWR and at or below 14,000 pounds GVWR that you certify to the refueling emission standards in paragraph (b) of this section in model years 2015 through 2017 and sell outside of California and the section 177 states, a single vehicle may produce two allowances if it is certified to the Tier 3 diurnal plus hot soak standard. Allowances earned under this paragraph (g)(1)(v) may alternatively be used in model years 2018 through 2022 to phase in the refueling standard, except that a single early-compliant vehicle produces only a single allowance.

(vi) Complete HDV above 14,000 pounds GVWR and all sizes of incomplete HDV earn allowances as described in paragraph (g)(1)(v) of this section if they are certified to the refueling emission standards in paragraph (b) of this section in model years 2015 through 2021.

(2) The following alternative phase-in options apply for model year 2017:

(i) You may disregard the percentage phase-in specified in paragraph (a)(5) of this section for 2017 if you choose 50-state certification for all your vehicles meeting the LEV III PZEV evaporative standards in 2017. Under this option, you may not produce a higher-emitting version of those vehicle models for sale outside of California or the section 177 states. Such vehicles may be certified using carryover data under the California program, but they may not generate or use emission credits. LDV and LDT1 that comply under this paragraph (g)(2)(i) may not generate allowances under paragraph (g)(1) of this section, regardless of the calculated percentage of compliant vehicles in model year 2017.

(ii) You may comply with the phase-in requirement for model year 2017 by meeting the Tier 3 emission standards for diurnal plus hot soak, running loss, and bleed emissions (or the equivalent set of California standards as allowed in this section) with 20 percent of vehicles at or below 6,000 pounds GVWR, and by meeting the leak standard in paragraph (a)(2)(iii) of this section with 20 percent of vehicles at or below 6,000 pounds GVWR. You may optionally include vehicles above 6,000 pounds GVWR under this paragraph (g)(2)(ii) to calculate the percentage (numerator only) if they meet the leak and/or evaporative emission standards in model year 2017. Vehicles complying with Tier 3 evaporative emission standards may generate or use emission credits relative to the diurnal plus hot soak standard as specified in this section, but they may not generate allowances. You may apply this option and use the alternative phase-in calculation in paragraph (g)(4) of this section, subject to the following conditions:

(A) You must meet or exceed the 20 percent threshold for both evaporative emissions and the leak standard.

(B) All the vehicles meeting the leak standard must also meet the Tier 3 evaporative emission standards and the OBD requirements in § 86.1806-17(b)(1).

(C) Determine the appropriate percentage for calculating compliance under paragraph (g)(4) of this section by adding 20 to the percentage of vehi-

cles meeting the Tier 3 evaporative emission standards to account for vehicles meeting the leak standard. Do not increase the percentage based on meeting the leak standard with more than 20 percent of your vehicles in model year 2017.

(3) If you certify model year 2021 or earlier vehicles to the LEV III evaporative emission standards in California, you may certify those as Tier 3 vehicles that count toward meeting the phase-in requirements of this section. Such vehicles must still be certified to the high-altitude standards in paragraph (a)(2) of this section and the leak standard specified in paragraph (a)(4) of this section. You may not certify vehicles under this paragraph (g)(3) after model year 2021. Vehicles meeting the LEV III standards may also generate allowances under paragraph (g)(1) of this section; however, these vehicles may generate or use emission credits under this subpart only if they are not used to generate allowances and if they are certified using the Option 2 procedures under the LEV III program (including the bleed emission test). Vehicles may be certified under this paragraph (g)(3) based on the rig test ("Option 1") if they are certified to LEV III standards based on the rig test before model year 2017; this certification option applies through model year 2021. Include these Option 1 vehicles in the calculation of fleet average emissions by using the appropriate Tier 3 emission standard as the FEL. Note that the rig test is considered a diurnal test with respect to the provisions to account for ethanol emissions as described in paragraph (a)(1)(iv) of this section.

(4) If you fall short of the phase-in percentage specifications in paragraph (a)(5) of this section, you may designate the requisite number of Tier 2 vehicles as Tier 3 vehicles for purposes of demonstrating compliance with the Tier 3 standards in this section. To do this, factor those Tier 2 vehicles into the Tier 3 fleet-average emission calculation using an FEL that is equal to the applicable diurnal plus hot soak standard from the two-day test sequence. The Tier 3 emission standards do not apply to these Tier 2 vehicles. In addition, you may disregard the phase-

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in percentages specified in paragraph (a)(5) of this section if you instead comply based on one of the following alternative measures:

(i) You may comply with an alternate phase-in schedule described in this paragraph (g)(4)(i). To do this, you must give us a detailed plan for describing how you will meet the alternate phase-in schedule. You comply with the alternate phase-in schedule by calculating an evaporative phase-in index using the following equation that is at or above 1,280 for model years 2017 through 2022 (or 1,040 for model years 2018 through 2022 if you use the provisions of paragraph (g)(2)(i) of this section):

$$\text{Evaporative phase-in index} = 6 \cdot \text{APP}_{2017} + 5 \cdot \text{APP}_{2018} + 4 \cdot \text{APP}_{2019} + 3 \cdot \text{APP}_{2020} + 2 \cdot \text{APP}_{2021} + \text{APP}_{2022}$$

Where:

APP = The phase-in percentage of vehicles meeting the Tier 3 evaporative emission standards for the indicated model year, based on actual sales, as described in paragraph (a)(5) of this section.

(ii) You may comply with an alternate phase-in schedule described in this paragraph (g)(4)(ii). To do this, you must give us a detailed plan for describing how you will meet the alternate phase-in schedule. You comply with the alternate phase-in schedule by calculating an evaporative phase-in index using the following equation that is at or above 420 for model years 2017 through 2022 (or 380 for model years 2018 through 2022 if you use the provisions of paragraph (g)(2)(i) of this section):

$$\text{Evaporative phase-in index} = \text{APP}_{2017} + \text{APP}_{2018} + \text{APP}_{2019} + \text{APP}_{2020} + \text{APP}_{2021} + \text{APP}_{2022}$$

Where:

APP = The phase-in percentage of vehicles meeting the Tier 3 evaporative emission standards for the indicated model year, based on actual sales, as described in paragraph (a)(5) of this section.

(5) This paragraph (g)(5) describes an alternative approach to phasing in the evaporative and refueling emission standards for gaseous-fueled vehicles above 8,500 pounds GVWR. Under this alternative phase-in, you may disregard the requirements of this section

related to evaporative emission standards that apply for these vehicles before model year 2019. Similarly, you may disregard the refueling emission standards of this section before model year 2019 for vehicles above 10,000 pounds GVWR. For model year 2019, you may exclude from the phase-in calculation any evaporative families with vehicles that have a Job 1 date on or before March 3, 2018 (see 40 CFR 85.2304). Any vehicles not subject to Tier 3 evaporative emission standards during this phase-in period must continue to comply with the evaporative emission standards in § 86.1816–08(d); such vehicles are subject to the useful life provisions in § 86.1805–12 relative to evaporative emission standards. Each vehicle counting toward the phase-in percentage under this paragraph (g)(5) must meet all the standards that apply throughout the useful life as specified in § 86.1805–17.

(h) *Small-volume manufacturers.* Small-volume manufacturers meeting the eligibility requirements in § 86.1838 may delay complying with the requirements in this section until model year 2022. If meeting the Tier 3 standards would cause severe economic hardship, such manufacturers may ask us to approve an extended compliance deadline under the provisions of 40 CFR 1068.250, except that the solvency criterion does not apply and there is no maximum duration of the hardship relief.

[79 FR 23718, Apr. 28, 2014]

§ 86.1816–05 Emission standards for complete heavy-duty vehicles.

This section applies to 2005 and later model year complete heavy-duty vehicles (2003 model year for manufacturers choosing Otto-cycle HDE option 1 in § 86.005–1(c)(1), or 2004 model year for manufacturers choosing Otto-cycle HDE option 2 in § 86.005–1(c)(2)) fueled by gasoline, methanol, natural gas and liquefied petroleum gas fuels except as noted. This section does not apply to Medium-duty Passenger Vehicles, which are covered under § 86.1811. This section also applies to 2000 and later model year complete heavy duty vehicles participating in the early banking provisions of the averaging, trading and banking program as specified in § 86.1817–05(n). Multi-fueled vehicles

shall comply with all requirements established for each consumed fuel. For methanol fueled vehicles, references in this section to hydrocarbons or total hydrocarbons shall mean total hydrocarbon equivalents and references to non-methane hydrocarbons shall mean non-methane hydrocarbon equivalents.

(a) *Exhaust emission standards.* (1) Exhaust emissions from 2005 and later model year complete heavy-duty vehicles at and above 8,500 pounds Gross Vehicle Weight Rating but equal to or less than 10,000 Gross Vehicle Weight Rating pounds shall not exceed the following standards at full useful life:

(i) [Reserved]

(ii) *Non-methane organic gas.* 0.280 grams per mile; this requirement may be satisfied by measurement of non-methane hydrocarbons or total hydrocarbons, at the manufacturer's option.

(iii) *Carbon monoxide.* 7.3 grams per mile.

(iv) *Oxides of nitrogen.* 0.9 grams per mile.

(v) [Reserved]

(2) Exhaust emissions from 2005 and later model year complete heavy-duty vehicles above 10,000 pounds Gross Vehicle Weight Rating but less than 14,000 pounds Gross Vehicle Weight Rating shall not exceed the following standards at full useful life:

(i) [Reserved]

(ii) *Non-methane organic gas.* 0.330 grams per mile; this requirement may be satisfied by measurement of non-methane hydrocarbons or total hydrocarbons, at the manufacturer's option.

(iii) *Carbon monoxide.* 8.1 grams per mile.

(iv) *Oxides of nitrogen.* 1.0 grams per mile.

(v) [Reserved]

(b)-(c) [Reserved]

(d) *Evaporative emissions.* Evaporative hydrocarbon emissions from gasoline-fueled, natural gas-fueled, liquefied petroleum gas-fueled, and methanol-fueled complete heavy-duty vehicles shall not exceed the following standards. The standards apply equally to certification and in-use vehicles. The spitback standard also applies to newly assembled vehicles.

(1) Gasoline, natural gas, liquefied petroleum gas, and methanol fuel. For the full three-diurnal test sequence, di-

urnal plus hot soak measurements: 3.0 grams per test.

(2) *Gasoline and methanol fuel only.* For the supplemental two-diurnal test sequence, diurnal plus hot soak measurements: 3.5 grams per test.

(3) *Gasoline and methanol fuel only.* Running loss test: 0.05 grams per mile.

(4) *Gasoline and methanol fuel only.* Fuel dispensing spitback test: 1.0 grams per test.

(e) *Refueling emissions*—(1) *Standards.* Refueling emissions from Otto-cycle complete heavy-duty vehicles equal to or less than 10,000 pounds Gross Vehicle Weight Rating shall be phased in, in accordance with the schedule in Table S01-5 in § 86.1810-01 not to exceed the following emission standards:

(i) For gasoline-fueled and methanol-fueled vehicles: 0.20 grams hydrocarbon per gallon (0.053 gram per liter) of fuel dispensed.

(ii) For liquefied petroleum gas-fueled vehicles: 0.15 grams hydrocarbon per gallon (0.04 gram per liter) of fuel dispensed.

(2) *Phase-in.* Complete heavy-duty vehicles subject to refueling standards must comply with the phase-in requirements found in Table S01-5 in § 86.1810-01, and must be grouped with HLDTs and MDPVs to determine phase-in compliance.

(3) *Alternate timing.* (i) For manufacturers choosing Otto-cycle HDE option 3 under § 86.005-1(c)(3), the refueling emissions standards are optional for 2004 model year complete heavy-duty vehicles.

(ii) For manufacturers choosing Otto-cycle HDE option 3 under § 86.005-1(c)(3), the manufacturer may exempt 2005 model year HDE test groups whose model year begins before July 31, 2004. Only 2005 model year HDE test groups whose model year begins on or after July 31, 2004 shall be considered (together with all 2005 model year HLDTs and MDPVs) for purposes of calculating the sales percentage for phase-in as outlined in § 86.1810-01(k).

(iii) For complete heavy-duty vehicles which have total fuel tank capacity of greater than 35 gallons, or which do not share a common fuel system with a light-duty truck or medium-duty passenger vehicle configuration, the refueling emissions standards are

optional for the 2004 and 2005 model years.

(4) *Exceptions.* The provisions of this § 86.1816-05(e) do not apply to incomplete heavy-duty vehicles optionally certified to complete heavy duty vehicle standards under the provisions of § 86.1801-01(c)(2).

(f) [Reserved]

(g) *Idle exhaust emission standards, complete heavy-duty vehicles.* Exhaust emissions of carbon monoxide from 2005 and later model year gasoline, methanol, natural gas and liquefied petroleum gas-fueled complete heavy-duty vehicles shall not exceed 0.50 percent of exhaust gas flow at curb idle for a useful life of 11 years or 120,000 miles, whichever occurs first. This does not apply for vehicles certified to the requirements of § 86.1806-05

(h) *Alternate test groups.* Manufacturers may request to group complete heavy-duty vehicles into the same test group as vehicles subject to more stringent standards, so long as those complete heavy-duty vehicles meet the most stringent standards applicable to any vehicle within that test group, as provided at § 86.1827- (a)(5) and (d)(4).

[65 FR 59970, Oct. 6, 2000, as amended at 66 FR 5190, Jan. 18, 2001]

§ 86.1816-08 Emission standards for complete heavy-duty vehicles.

Section 86.1816-08 includes text that specifies requirements that differ from those specified in § 86.1816-05. Where a paragraph in § 86.1816-05 is identical and applicable to § 86.1816-08, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.1816-05.”. This section applies to 2008 and later model year complete heavy-duty vehicles (excluding MDPVs) fueled by gasoline, methanol, natural gas and liquefied petroleum gas fuels except as noted. Multi-fueled vehicles shall comply with all requirements established for each consumed fuel. For methanol fueled vehicles, references in this section to hydrocarbons or total hydrocarbons shall mean total hydrocarbon equivalents and references to non-methane hydrocarbons shall mean non-methane hydrocarbon equivalents.

(a) *Exhaust emission standards.* (1) Exhaust emissions from 2008 and later model year complete heavy-duty vehicles at and above 8,500 pounds Gross Vehicle Weight Rating but equal to or less than 10,000 Gross Vehicle Weight Rating pounds shall not exceed the following standards at full useful life:

(i) [Reserved]

(ii) *Non-methane hydrocarbons.* (A) 0.195 grams per mile; this requirement may be satisfied by measurement of non-methane organic gas or total hydrocarbons, at the manufacturer's option. For alcohol-fueled vehicles, this standard is 0.195 grams per mile NMHCE.

(B) A manufacturer may elect to include any or all of its test groups in the NMHC emissions ABT programs for heavy-duty vehicles, within the restrictions described in § 86.1817-05, or § 86.1817-08. If the manufacturer elects to include test groups in any of these programs, the NMHC FEL may not exceed 0.28 grams per mile. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading.

(iii) *Carbon monoxide.* 7.3 grams per mile.

(iv) *Oxides of nitrogen.* (A) 0.2 grams per mile.

(B) A manufacturer may elect to include any or all of its test groups in the NO_x emissions ABT programs for heavy-duty vehicles, within the restrictions described in § 86.1817-05 or § 86.1817-08. If the manufacturer elects to include test groups in any of these programs, the NO_x FEL may not exceed 0.9 grams per mile. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading.

(v) *Particulate.* 0.02 grams per mile.

(vi) *Formaldehyde.* 0.032 grams per mile.

(2) Exhaust emissions from 2008 and later model year complete heavy-duty vehicles above 10,000 pounds Gross Vehicle Weight Rating but less than 14,000 pounds Gross Vehicle Weight Rating shall not exceed the following standards at full useful life:

(i) [Reserved]

(ii) *Non-methane hydrocarbons.* (A) 0.230 grams per mile; this requirement may be satisfied by measurement of

non-methane organic gas or total hydrocarbons, at the manufacturer's option. For alcohol-fueled vehicles, this standard is 0.230 grams per mile NMHCE.

(B) A manufacturer may elect to include any or all of its test groups in the NMHC emissions ABT programs for heavy-duty vehicles, within the restrictions described in § 86.1817-05, or § 86.1817-08. If the manufacturer elects to include test groups in any of these programs, the NMHC FEL may not exceed 0.33 grams per mile. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading.

(iii) *Carbon monoxide*. 8.1 grams per mile.

(iv) *Oxides of nitrogen*. (A) 0.4 grams per mile.

(B) A manufacturer may elect to include any or all of its test groups in the NO_x emissions ABT programs for heavy-duty vehicles, within the restrictions described in § 86.1817-05, or § 86.1817-08. If the manufacturer elects to include test groups in any of these programs, the NO_x FEL may not exceed 1.0 grams per mile. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading.

(v) *Particulate*. 0.02 grams per mile.

(vi) *Formaldehyde*. 0.040 grams per mile.

(b)-(c) [Reserved]

(d) *Evaporative emissions*. Evaporative hydrocarbon emissions from gasoline-fueled, natural gas-fueled, liquefied petroleum gas-fueled, and methanol-fueled complete heavy-duty vehicles shall not exceed the following standards. The standards apply equally to certification and in-use vehicles. The spitback standard also applies to newly assembled vehicles.

(1) For the full three-diurnal test sequence, diurnal plus hot soak measurements: 1.4 grams per test.

(2) Gasoline and methanol fuel only. For the supplemental two-diurnal test sequence, diurnal plus hot soak measurements: 1.75 grams per test.

(3) Gasoline and methanol fuel only. Running loss test: 0.05 grams per mile.

(4) Gasoline and methanol fuel only. Fuel dispensing spitback test: 1.0 grams per test.

(e) through (h) [Reserved]. For guidance see § 86.1816-05.

(i) *Phase-in options*. (1)(i) For model year 2008, manufacturers may certify some of their test groups to the standards applicable to model year 2008 vehicles under § 86.1816-05, in lieu of the exhaust standards specified in this section. These vehicles must comply with all other requirements applicable to model year 2007 vehicles. The combined number of vehicles in the test groups certified to the 2008 standards may not exceed 50 percent of the manufacturer's U.S. heavy-duty vehicle sales of complete heavy-duty Otto-cycle motor vehicles for model year 2008, except as explicitly allowed by paragraph (i)(2) of this section.

(ii) For model year 2008, manufacturers may certify some of their test groups to the evaporative standards applicable to model year 2007 engines under § 86.1816-05, in lieu of the evaporative standards specified in this section. These vehicles must comply with all other requirements applicable to model year 2008 vehicles, except as allowed by paragraph (i)(1)(i) of this section. The combined number of vehicles in the test groups certified to the 2007 standards may not exceed 50 percent of the manufacturer's U.S. heavy-duty vehicle sales of complete heavy-duty Otto-cycle motor vehicles for model year 2008.

(2)(i) Manufacturers certifying vehicles to all of the applicable standards listed in paragraph (a) of this section prior to model year 2008 (without using credits) may reduce the number of vehicles that are required to meet the standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (i)(1) of this section. For every vehicle that is certified early, the manufacturer may reduce the number of vehicles that are required by paragraph (i)(1) of this section to meet the standards listed in paragraph (a) of this section by one vehicle. For example, if a manufacturer produces 100 heavy-duty Otto-cycle vehicles in 2007 that meet all of the applicable the standards listed in paragraph (a) of this section, and it produced 10,000 heavy-duty Otto-cycle vehicles in 2009, then only 9,900 of the vehicles

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would need to comply with the standards listed in paragraph (a) of this section.

(ii) Manufacturers certifying vehicles to all of the applicable evaporative standards listed in paragraph (d) of this section prior to model year 2008 may reduce the number of vehicles that are required to meet the standards listed in paragraph (d) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (i)(1) of this section. For every vehicle that is certified early, the manufacturer may reduce the number of vehicles that are required by paragraph (i)(1) of this section to meet the evaporative standards listed in paragraph (d) of this section by one vehicle.

(3) Manufacturers certifying vehicles to all of the applicable standards listed in paragraph (i)(3)(i) or (ii) of this section (without using credits) and the evaporative standards listed in paragraph (d) of this section prior to model year 2008 may reduce the number of vehicles that are required to meet the standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (i)(1)(i) of this section. For every such vehicle that is certified early with sufficiently low emissions, the manufacturer may reduce the number of vehicles that are required by paragraph (i)(1)(i) of this section to meet the standards listed in paragraph (a) of this section by two vehicles. The applicable standards are:

(i) For complete heavy-duty vehicles at and above 8,500 pounds Gross Vehicle Weight Rating but equal to or less than 10,000 Gross Vehicle Weight Rating: 0.100 g/mile NMHC, 0.10 g/mile NO_x, 3.2 g/mile CO, 0.008 g/mile formaldehyde, and 0.02 g/mile PM.

(ii) For complete heavy-duty vehicles at or above 10,000 pounds Gross Vehicle Weight Rating but equal to or less than 14,000 Gross Vehicle Weight Rating: 0.117 g/mile NMHC, 0.20 g/mile NO_x, 3.7 g/mile CO, 0.010 g/mile formaldehyde, and 0.02 g/mile PM.

(j) (1) For model years prior to 2012, for purposes of determining compliance after title or custody has transferred to the ultimate purchaser, for vehicles meeting the applicable emission stand-

ards of this section, the applicable compliance limits shall be determined by adding the applicable adjustment from paragraph (j)(2) of this section to the otherwise applicable standard or FEL.

(2) The in-use adjustments are:

(i) 0.1 g/mi for NO_x.

(ii) 0.100 g/mi NMHC.

(iii) 0.01 g/mi for PM.

[66 FR 5190, Jan. 18, 2001, as amended at 70 FR 40443, July 13, 2005]

§ 86.1816–18 Emission standards for heavy-duty vehicles.

(a) *Applicability and general provisions.* This section describes exhaust emission standards that apply for model year 2018 and later complete heavy-duty vehicles. These standards are optional for incomplete heavy-duty vehicles and for heavy duty vehicles above 14,000 pounds GVWR as described in § 86.1801. Greenhouse gas emission standards are specified in § 86.1818 for MDPVs and in 40 CFR 1037.104 for other HDV. See § 86.1813 for evaporative and refueling emission standards. This section may apply to vehicles before model year 2018 as specified in paragraph (b)(11) of this section. Separate requirements apply for MDPVs as specified in § 86.1811. See subpart A of this part for requirements that apply for incomplete heavy-duty vehicles and for heavy-duty engines certified independent of the chassis. The following general provisions apply:

(1) Test all vehicles as described in this section using a chassis dynamometer; establish appropriate load settings based on adjusted loaded vehicle weight (see § 86.1803).

(2) Some provisions apply differently depending on the vehicle's power-to-weight ratio. Determine a vehicle's power-to-weight ratio by dividing the engine's rated power by the vehicle's GVWR (in hp/pound). For purposes of this section, if a test group includes multiple configurations, use the vehicle with the highest power-to-weight ratio to characterize the test group.

(3) Use E10 test fuel as required in § 86.113, except as specified in this section.

(4) Measure emissions from hybrid electric vehicles (including plug-in hybrid electric vehicles) as described in 40

CFR part 1066, subpart F, except that these procedures do not apply for plug-in hybrid electric vehicles during charge-depleting operation.

(b) *Tier 3 exhaust emission standards.* Exhaust emissions may not exceed the Tier 3 exhaust emission standards, as follows:

(1) Measure emissions using the procedures of subpart B of this part, using specific driving schedules and additional procedures as follows:

(i) The Federal Test Procedure (FTP) is based on testing with the Urban Dynamometer Driving Schedule (UDDS) specified in paragraph (a) of Appendix I of this part.

(ii) The Heavy-Duty Supplemental Federal Test Procedure (HD-SFTP) involves testing with the UDDS, the SC03 driving schedule specified in paragraph (h) of Appendix I of this part, and one of the following additional driving schedules:

(A) For Class 2b vehicles, the US06 driving schedule specified in paragraph (g) of Appendix I of this part.

(B) For Class 2b vehicles with a power-to-weight ratio at or below 0.024 hp/pound that are certified to optional standards under paragraphs (b)(2) and (4) of this section, the highway portion of the US06 driving schedule characterized as the “second bag” in §86.159-08(a).

(C) For Class 3 vehicles, the LA-92 driving schedule as specified in paragraph (c) of Appendix I of this part.

(iii) HD-SFTP emissions are calculated as a composite of test results over these driving schedules based on the following calculation:

$$\text{HD-SFTP (g/mi)} = 0.35 \cdot \text{FTP} + 0.28 \cdot \text{HDSIM} + 0.37 \cdot \text{SC03}$$

Where:

HDSIM = the appropriate driving schedule specified in paragraph (b)(1)(ii)(A) through (C) of this section.

(iv) You may alternatively use FTP emission results to substitute for the SC03 value in the calculation under paragraph (b)(1)(iii) of this section for a given vehicle for any testing under this section. Such vehicles remain subject to the SFTP standard when tested over the SC03 driving schedule.

(v) Hydrocarbon emission standards are expressed as NMOG; however, you may measure exhaust emissions based on nonmethane hydrocarbon instead of NMOG as described in 40 CFR 1066.635.

(2) Table 1 of this section describes fully phased-in Tier 3 standards that apply as specified in this paragraph (b) for the identified driving schedules. The FTP standards for NMOG+NO_x apply on a fleet-average basis using discrete bin standards as described in paragraph (b)(4) of this section. The bin standards include additional emission standards for CO emissions, and for NMOG+NO_x standards when testing over the HD-SFTP driving schedule. Table 1 follows:

TABLE 1 OF §86.1816-18—FULLY PHASED-IN TIER 3 HDV EXHAUST EMISSION STANDARDS
[Tg/mile]

HDV class	Fleet-average NMOG+NO _x	PM		Formaldehyde
		FTP	HD-SFTP	FTP
2b	0.178	0.008	0.010 ¹	0.006
3	0.247	0.010	0.007	0.006

¹For vehicles with a power-to-weight ratio at or below 0.024 hp/pound that are certified using the driving schedule described in paragraph (b)(1)(ii)(B) of this section, the HD-SFTP standard for PM is 0.007 g/mile instead of the value specified in the table.

(3) The FTP standards specified in this section apply equally for testing at low-altitude conditions and high-altitude conditions. The HD-SFTP standards described in this section apply only for testing at low-altitude conditions.

(4) The FTP emission standard for NMOG+NO_x is based on a fleet average

in a given model year. You must specify a family emission limit (FEL) for each test group. The FEL serves as the emission standard for the test group with respect to all required FTP testing. Calculate your fleet-average emission level as described in §86.1860 to show that you meet the specified standard. For multi-fueled vehicles,

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calculate fleet-average emission levels based only on emission levels for testing with gasoline or diesel fuel. You may generate or use emission credits for banking and trading and you may use banked or traded credits for demonstrating compliance with the FTP emission standard for NMOG+NO_x as described in § 86.1861. You comply with the emission standard for a given model year if you have enough credits to show that your fleet-average emission level is at or below the applicable standard. You may exchange credits

between or among any test groups subject to standards under this section. Specify one of the identified values from Table 2 or Table 3 of this section as the FEL for demonstrating that your fleet-average emission level complies with the FTP emission standard for NMOG+NO_x. These FEL values define emission bins that also determine corresponding emission standards for NMOG+NO_x emissions over the HD-SFTP driving schedule and for CO emissions, as follows:

TABLE 2 OF § 86.1816–18—TIER 3 BIN STANDARDS—CLASS 2b
[g/mile]

FEL Name	NMOG+NO _x		CO	
	FTP (FEL)	HD-SFTP ¹	FTP	HD-SFTP
Bin 250	0.250	0.800	6.4	22.0
Bin 200	0.200	0.800	4.2	22.0
Bin 170	0.170	0.450	4.2	12.0
Bin 150	0.150	0.450	3.2	12.0
Bin 0 ²	0.000	0.000	0.0	0.0

¹ Vehicles with a power-to-weight ratio at or below 0.024 hp/pound that are certified using the driving schedule described in paragraph (b)(1)(ii)(B) of this section, the following HD-SFTP bin standards for NMOG+NO_x apply instead of those identified in the table: 0.350 g/mile for Bin 150 and Bin 170; and 0.550 g/mile for Bin 200 and Bin 250.

² Vehicles certified to Bin 0 must also meet PM and formaldehyde standards of 0.000 g/mile instead of the standards specified in paragraph (b)(2) of this section.

TABLE 3 OF § 86.1816–18—TIER 3 BIN STANDARDS—CLASS 3
[g/mile]

FEL Name	NMOG+NO _x		CO	
	FTP (FEL)	HD-SFTP	FTP	HD-SFTP
Bin 400	0.400	0.550	7.3	6.0
Bin 270	0.270	0.550	4.2	6.0
Bin 230	0.230	0.350	4.2	4.0
Bin 200	0.200	0.350	3.7	4.0
Bin 0 ¹	0.000	0.000	0.0	0.0

¹ Vehicles certified to Bin 0 must also meet PM and formaldehyde standards of 0.000 g/mile instead of the standards specified in paragraph (b)(2) of this section.

(5) [Reserved]

(6) The full Tier 3 program includes new emission standards for NMOG+NO_x, PM, CO, and formaldehyde; it also includes measurement with a new test fuel and a longer useful life. Vehicles meeting all these requirements are considered Final Tier 3 vehicles. Vehicles that do not meet all the Tier 3 requirements are considered Interim Tier 3 vehicles. The Tier 3 PM standards phase in over several years. Any vehicles not subject to Tier 3 PM standards during the phase-in period must continue to comply with the PM standards in § 86.1816–08. Paragraph (b)(7) of this section describes how to

transition to Tier 3 standards for emissions other than PM. The following provisions describe the primary approach for phasing in the Tier 3 PM standards:

(i) You must meet the FTP emission standard for PM with 20, 40, 70, and 100 percent of your projected nationwide sales of all vehicles subject to this section in model years 2018 through 2021, respectively. Each vehicle meeting the Tier 3 FTP standard for PM must also meet the Tier 3 HD-SFTP standard for PM.

(ii) You may disregard the phase-in percentages specified in paragraph (b)(6)(i) of this section if you instead

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comply with an indexed PM phase-in schedule as described in this paragraph (b)(6)(ii). To do this, you must notify us of your intent before January 1, 2018, and include a detailed plan for complying with the indexed phase-in schedule. You comply with the indexed phase-in schedule by calculating a PM phase-in index at or above 440 using the following equation for model years 2018 through 2021:

$$\text{PM phase-in index} = 4 \cdot \text{APP}_{2018} + 3 \cdot \text{APP}_{2019} + 2 \cdot \text{APP}_{2020} + \text{APP}_{2021}$$

Where:

APP = The phase-in percentage of vehicles meeting the Tier 3 PM standards for the indicated model year, based on actual sales.

(iii) Vehicles meeting the Tier 3 PM standards must meet those standards over the useful life as specified in § 86.1805. Note that Interim Tier 3 vehicles may have different useful life values for PM emission standards than for other emission standards.

(iv) Measure PM emissions from all vehicles using the same test fuel used for measuring NMOG+NO_x emissions.

(v) You may certify Interim Tier 3 vehicles based on carryover data.

(vi) You may use the alternative phase-in provisions described in paragraph (b)(8) of this section to transition to the Tier 3 exhaust emission standards on a different schedule.

(7) The following provisions describe the primary approach for phasing in the Tier 3 standards other than PM in 2022 and earlier model years:

(i) The fleet-average FTP emission standard for NMOG+NO_x phases in over several years as described in this paragraph (b)(7)(i). You must identify FELs as described in paragraph (b)(4) of this section and calculate a fleet-average emission level to show that you meet the FTP emission standard for NMOG+NO_x that applies for each model year. You may certify using transitional bin standards specified in Table 5 of this section through model year 2021; these vehicles are subject to FTP emission standards for PM and formaldehyde as described in paragraph (b)(2) of this section. You may use the E0 test fuel specified in § 86.113 for gasoline-fueled vehicles certified to the transitional bins; the useful life period for these vehicles is 120,000 miles or 11 years. Fleet-average FTP emission standards decrease as shown in the following table:

TABLE 4 OF § 86.1816–18—DECLINING FLEET-AVERAGE FTP EMISSION STANDARDS FOR NMOG+NO_x

[g/mile]		
Model Year	Class 2b	Class 3
2016 ¹	0.333	0.548
2017 ¹	0.310	0.508
2018	0.278	0.451
2019	0.253	0.400
2020	0.228	0.349
2021	0.203	0.298
2022	0.178	0.247

¹ Fleet-average standards are shown for 2016 and 2017 for purposes of voluntary early compliance as described in paragraph (b)(11) of this section.

TABLE 5 OF § 86.1816–18—TRANSITIONAL TIER 3 FTP BIN STANDARDS

[g/mile] ¹				
Class	FEL Name	NMOG+NO _x	NO _x ²	CO
2b	Bin 395	0.395	0.2	6.4
	Bin 340	0.340	0.2	6.4
3	Bin 630	0.630	0.4	7.3
	Bin 570	0.570	0.4	7.3

¹ Vehicles certified to Transitional Tier 3 FTP bins are not subject to HD-SFTP standards.

² The NO_x standard applies only for certification testing with emission-data vehicles.

(ii) You may use the alternative phase-in provisions described in paragraph (b)(8) of this section to transition to the Tier 3 exhaust emission standards on a different schedule.

(8) This paragraph (b)(8) describes an alternative approach to phasing in the Tier 3 emission standards. If you

choose this approach, you must phase in the Tier 3 standards for all your vehicles subject to this section according to this schedule. Under this alternative phase in, you must meet all the standards specified in paragraph (b)(2) of this section according to the phase-in schedule specified in Table 6 of this

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section based on the indicated percentage of your projected nationwide sales in each model year. These vehicles must meet the applicable FTP emission standard for CO and the HD-SFTP emission standards for NMOG+NO_x and CO that apply for Class 2b Bin 170 and Class 3 Bin 230 as described in paragraph (b)(4) of this section. Any vehicles not subject to Tier 3 standards during the phase-in period must continue to comply with the gaseous exhaust emission standards in § 86.1816–08. Each vehicle counting toward the PM phase-in percentage under this paragraph (b)(8) in model years 2019 and 2020 must also be included in the portion of the fleet meeting the Tier 3 standards for pollutants other than PM. Each vehicle counting toward the phase-in percentage for any pollutant

must use the Tier 3 test fuel specified in § 86.113–07. The following exceptions and special provisions apply under this paragraph (b)(8):

(i) For model year 2019, you may exclude from the phase-in calculation any test groups that have a Job 1 date on or before March 3, 2018 (see 40 CFR 85.2304).

(ii) You may generate Tier 3 emission credits during the phase-in period if all your pre-Tier 3 vehicles in a given model year have FELs at or below the NO_x and NMHC standards in § 86.1816–08. Determine emission credits by calculating fleet-average emission levels for Tier 3 and pre-Tier 3 vehicles together; for pre-Tier 3 vehicles use an NMOG+NO_x equivalent FEL of 0.395 g/mile for Class 2b vehicles and 0.630 g/mile for Class 3 vehicles.

TABLE 6 OF § 86.1816–18—ALTERNATIVE PHASE-IN SCHEDULE

Model Year	Class 2b		Class 3	
	PM (percent)	Other than PM (percent)	PM (percent)	Other than PM (percent)
2019	40	65	40	60
2020	70	77	70	73
2021	100	88	100	87
2022	100	100	100	100

(9) You may not use credits generated from vehicles certified under § 86.1816–08 for demonstrating compliance with the Tier 3 standards.

(10) [Reserved]

(11) You may voluntarily certify your vehicles under this section in model years 2016 and 2017. If you do this, the fleet-average FTP emission standards for NMOG+NO_x apply to all your heavy-duty vehicles under this section as specified in paragraph (b)(7)(i) of this section. Use any of the available bin standards as described in this section. Vehicles certified under this paragraph (b)(11) must comply with the PM standards specified in § 86.1816–08 instead of the Tier 3 PM standards specified in this section.

(12) Alternate standards apply for in-use testing with 2022 and earlier model year vehicles as described in this paragraph (b)(12). These alternate standards apply in the first model year that a test group is certified to Tier 3 FTP or HD-SFTP standards for NMOG+NO_x or

PM under this section. The alternate in-use standards also apply in the following model year (but not beyond 2022) for carryover test groups certified to the same bin standards. If you certify a test group to more stringent bin standards under this section in a given model year, the alternate in-use standards apply as if that were the first model year of certifying to the Tier 3 standards. The provisions of this section apply separately for NMOG+NO_x and PM. This paragraph (b)(12) does not apply for Bin 0 vehicles.

(i) The alternate in-use FTP standards for PM are 0.016 g/mile for Class 2b vehicles and 0.020 g/mile for Class 3 vehicles.

(ii) The alternate in-use HD-SFTP standards for PM are 0.012 g/mile for Class 2b vehicles with a power-to-weight ratio at or below 0.024 hp/pound that are certified to optional standards under paragraphs (b)(2) and (4) of this section, and 0.015 g/mile for other Class 2b vehicles. The alternate in-use HD-

SFTP standard for PM is 0.012 g/mile for Class 3 vehicles. Alternate in-use HD-SFTP standards do not apply for vehicles certified to the transitional

bins described in paragraph (b)(7) of this section.

(iii) Alternate in-use FTP and HD-SFTP standards for NMOG+NO_x apply as specified in the following table:

TABLE 7 OF § 86.1816-18—ALTERNATE IN-USE NMOG+NO_x STANDARDS
[g/mile]

Class	FEL Name	FTP	HD-SFTP ¹
2b	Bin 250	0.370	1.120
	Bin 200	0.300	1.120
	Bin 170	0.250	0.630
	Bin 150	0.220	0.630
3	Bin 400	0.600	0.770
	Bin 270	0.400	0.770
	Bin 230	0.340	0.490
	Bin 200	0.300	0.490

¹For Class 2b vehicles with a power-to-weight ratio at or below 0.024 hp/pound that are certified to optional standards under paragraphs (b)(2) and (4) of this section, the following alternate in-use FTP standards for NMOG+NO_x apply instead of those identified in the table: 0.490 g/mile for Bin 150 and Bin 170; and 0.770 g/mile for Bin 200 and Bin 250. Note that vehicles certified to transitional Tier 3 FTP bins are not subject to HD-SFTP standards.

(13) Keep records as needed to show that you meet the requirements specified in this paragraph (b) for phasing in standards and for complying with declining fleet-average average standards.

(c) *Highway NMOG+NO_x exhaust emission standard.* For vehicles certified to any of the Tier 3 standards specified in paragraph (b) of this section, NMOG+NO_x emissions measured on the highway test cycle in 40 CFR part 600, subpart B, may not exceed the applicable NMOG+NO_x bin standard for FTP testing. Demonstrate compliance with this standard for low-mileage vehicles by applying the appropriate deterioration factor.

(d) *Provisions for Otto-cycle engines.* The special provisions described in § 86.1811-17(d) apply to vehicles with Otto-cycle engines that are certified under this section.

(e) *Small-volume manufacturers.* Small-volume manufacturers meeting the eligibility requirements in § 86.1838 may delay complying with the requirements in this section until model year 2022. This also applies for continuing to use the E0 test fuel specified in § 86.113 through model year 2021. If meeting the Tier 3 standards would cause severe economic hardship, such manufacturers may ask us to approve an extended compliance deadline under the provisions of 40 CFR 1068.250, except that the solvency criterion does not apply and

there is no maximum duration of the hardship relief.

[79 FR 23721, Apr. 28, 2014]

§ 86.1817-05 Complete heavy-duty vehicle averaging, trading, and banking program.

(a) *General.* (1) Complete heavy-duty vehicles eligible for the NO_x averaging, trading and banking program are described in the applicable emission standards section of this subpart. All heavy-duty vehicles which include an engine labeled for use in clean-fuel vehicles as specified in 40 CFR part 88 are not eligible for this program. Participation in this averaging, trading, and banking program is voluntary.

(2)(i) Test groups with a family emission limit (FEL) as defined in § 86.1803-01 exceeding the applicable standard shall obtain emission credits as defined in § 86.1803-01 in a mass amount sufficient to address the shortfall. Credits may be obtained from averaging, trading, or banking, as defined in § 86.1803-01 within the averaging set restrictions described in paragraph (d) of this section.

(ii) Test groups with an FEL below the applicable standard will have emission credits available to average, trade, bank or a combination thereof. Credits may not be used for averaging or trading to offset emissions that exceed an

FEL. Credits may not be used to remedy an in-use nonconformity determined by a Selective Enforcement Audit or by recall testing. However, credits may be used to allow subsequent production of vehicles for the test group in question if the manufacturer elects to recertify to a higher FEL.

(b) *Participation.* Participation in the NO_x averaging, trading, and banking program shall be done as follows:

(1) During certification, the manufacturer shall:

(i) Declare its intent to include specific test groups in the averaging, trading and banking program.

(ii) Declare an FEL for each test group participating in the program.

(A) The FEL must be to the same level of significant digits as the emission standard (one-hundredth of a gram per mile for NO_x emissions).

(B) In no case may the FEL exceed the upper limit prescribed in the section concerning the applicable complete heavy-duty vehicle chassis-based NO_x emission standard.

(iii) Calculate the projected NO_x emission credits (positive or negative) as defined in § 86.1803-01 based on quarterly production projections for each participating test group, using the applicable equation in paragraph (c) of this section and the applicable factors for the specific test group.

(iv)(A) Determine and state the source of the needed credits according to quarterly projected production for test groups requiring credits for certification.

(B) State where the quarterly projected credits will be applied for test groups generating credits.

(C) Emission credits as defined in § 86.1803-01 may be obtained from or applied to only test groups within the same averaging set as defined in § 86.1803-01. Emission credits available for averaging, trading, or banking, may be applied exclusively to a given test group, or designated as reserved credits as defined in § 86.1803-01.

(2) Based on this information, each manufacturer's certification application must demonstrate:

(i) That at the end of model year production, each test group has a net emissions credit balance of zero or

more using the methodology in paragraph (c) of this section with any credits obtained from averaging, trading or banking.

(ii) The source of the credits to be used to comply with the emission standard if the FEL exceeds the standard, or where credits will be applied if the FEL is less than the emission standard. In cases where credits are being obtained, each test group involved must state specifically the source (manufacturer/test group) of the credits being used. In cases where credits are being generated/supplied, each test group involved must state specifically the designated use (manufacturer/test group or reserved) of the credits involved. All such reports shall include all credits involved in averaging, trading or banking.

(3) During the model year, manufacturers must:

(i) Monitor projected versus actual production to be certain that compliance with the emission standards is achieved at the end of the model year.

(ii) Provide the end-of-year reports required under paragraph (i) of this section.

(iii) For manufacturers participating in emission credit trading, maintain the quarterly records required under paragraph (1) of this section.

(4) Projected credits based on information supplied in the certification application may be used to obtain a certificate of conformity. However, any such credits may be revoked based on review of end-of-model year reports, follow-up audits, and any other compliance measures deemed appropriate by the Administrator.

(5) Compliance under averaging, banking, and trading will be determined at the end of the model year. Test groups without an adequate amount of NO_x emission credits will violate the conditions of the certificate of conformity. The certificates of conformity may be voided ab initio for test groups exceeding the emission standard.

(6) If EPA or the manufacturer determines that a reporting error occurred on an end-of-year report previously submitted to EPA under this section, the manufacturer's credits and credit

calculations will be recalculated. Erroneous positive credits will be void. Erroneous negative balances may be adjusted by EPA for retroactive use.

(i) If EPA review of a manufacturer's end-of-year report indicates a credit shortfall, the manufacturer will be permitted to purchase the necessary credits to bring the credit balance for that test group to zero, at the ratio of 1.2 credits purchased for every credit needed to bring the balance to zero. If sufficient credits are not available to bring the credit balance for the test group in question to zero, EPA may void the certificate for that test group ab initio.

(ii) If within 180 days of receipt of the manufacturer's end-of-year report, EPA review determines a reporting error in the manufacturer's favor (i.e. resulting in a positive credit balance) or if the manufacturer discovers such an error within 180 days of EPA receipt of the end-of-year report, the credits will be restored for use by the manufacturer.

(c) *Calculations.* For each participating test group, NO_x emission credits (positive or negative) are to be calculated according to one of the following equations and rounded, in accordance with ASTM E29-93a (incorporated by reference at § 86.1), to the nearest one-tenth of a Megagram (MG). Consistent units are to be used throughout the equation.

(1) For determining credit need for all test groups and credit availability for test groups generating credits for averaging only:

$$\text{Emission credits} = (\text{Std-FEL}) \times (\text{UL}) \times (\text{Production}) \times (10^{-6})$$

(2) For determining credit availability for test groups generating credits for trading or banking:

$$\text{Emission credits} = (\text{Std-FEL}) \times (\text{UL}) \times (\text{Production}) \times (10^{-6}) (\text{Discount})$$

(3) For purposes of the equations in paragraphs (c)(1) and (c)(2) of this section:

Std = the current and applicable complete heavy-duty vehicle NO_x emission standard in grams per mile or grams per kilometer.

Std = 0.9 grams per mile for heavy-duty vehicles at and above 8,500 pounds Gross Vehicle Weight Rating but equal to or less than 10,000 Gross Vehicle Weight Rating

pounds and 1.0 grams per mile for heavy-duty vehicles above 10,000 pounds Gross Vehicle Weight Rating but less than 14,000 pounds Gross Vehicle Weight Rating for cases where certification to chassis-based standards is optional for purposes of early credit banking.

FEL = the NO_x family emission limit for the test group in grams per mile or grams per kilometer.

UL = the useful life, or alternative life as described in paragraph (c) of § 86.1805-01, for the given test group in miles or kilometers.

Production = the number of vehicles produced for U.S. sales within the given test group during the model year. Quarterly production projections are used for initial certification. Actual production is used for end-of-year compliance determination.

Discount = a one-time discount applied to all credits to be banked or traded within the model year generated. Except as otherwise allowed in paragraph (m) of this section, the discount applied here is 0.9. Banked credits traded in a subsequent model year will not be subject to an additional discount. Banked credits used in a subsequent model year's averaging program will not have the discount restored.

(d) *Averaging sets.* The averaging and trading of NO_x emission credits will be allowed between all test groups of heavy-duty vehicles subject to chassis-based standards excluding those vehicles produced for sale in California. Averaging, banking, and trading are not applicable to vehicles sold in California.

(e) *Banking of NO_x emission credits—*
(1) *Credit deposits.* (i) NO_x emission credits may be banked from test groups produced in 2000 and later model years. Early banking is described in paragraph (n) of this section.

(ii) Manufacturers may bank credits only after the end of the model year and after actual credits have been reported to EPA in the end-of-year report. During the model year and before submittal of the end-of-year report, credits originally designated in the certification process for banking will be considered reserved and may be redesignated for trading or averaging.

(2) *Credit withdrawals.* (i) NO_x credits do not expire, except as provided in paragraph (o)(2) of this section.

(ii) Manufacturers withdrawing banked emission credits shall indicate so during certification and in their

credit reports, as described in paragraph (i) of this section.

(3) *Use of banked emission credits.* The use of banked credits shall be within the averaging set and geographic restrictions described in paragraph (d) of this section, and only for the following purposes:

(i) Banked credits may be used in averaging, or in trading, or in any combination thereof, during the certification period. Credits declared for banking from the previous model year but not reported to EPA may also be used. However, if EPA finds that the reported credits cannot be proven, they will be revoked and unavailable for use.

(ii) Banked credits may not be used for averaging and trading to offset emissions that exceed an FEL. Banked credits may not be used to remedy an in-use nonconformity determined by a Selective Enforcement Audit or by recall testing. However, banked credits may be used for subsequent production of the test group if the manufacturer elects to recertify to a higher FEL.

(f) *Negative credit balance.* In the event of a negative credit balance in a trading situation, both the buyer and the seller would be liable.

(g) *Fuel.* Certification fuel used for credit generation must be of a type that is both available in use and expected to be used by the vehicle purchaser. Therefore, upon request by the Administrator, the vehicle manufacturer must provide information acceptable to the Administrator that the designated fuel is readily available commercially and would be used in customer service.

(h) *Credit apportionment.* At the manufacturer's option, credits generated from complete heavy-duty vehicles under the provisions described in this section may be sold to or otherwise provided to another party for use in programs other than the averaging, trading and banking program described in this section.

(1) The manufacturer shall pre-identify two emission levels per test group for the purposes of credit apportionment. One emission level shall be the FEL and the other shall be the level of the standard that the test group is required to certify under § 86.1816-04. For

each test group, the manufacturer may report vehicle sales in two categories, "ABT-only credits" and "nonmanufacturer-owned credits".

(i) For vehicle sales reported as "ABT-only credits", the credits generated must be used solely in the averaging, trading and banking program described in this section.

(ii) The vehicle manufacturer may declare a portion of vehicle sales "nonmanufacturer-owned credits" and this portion of the credits generated between the standard and the FEL, based on the calculation in paragraph (c)(1) of this section, would belong to the vehicle purchaser. The manufacturer may not generate any credits for the vehicle sales reported as "nonmanufacturer-owned credits" for this averaging, trading and banking program. Vehicles reported as "nonmanufacturer-owned credits" shall comply with the FEL and the requirements of this averaging, trading and banking program in all other respects.

(2) Only manufacturer-owned credits reported as "ABT-only credits" shall be used in the averaging, trading, and banking provisions described in this section.

(3) Credits shall not be double-counted. Credits used in this averaging, trading and banking program may not be provided to a vehicle purchaser for use in another program.

(4) Manufacturers shall determine and state the number of vehicles sold as "ABT-only credits" and "nonmanufacturer-owned credits" in the end-of-model year reports required under paragraph (i) of this section.

(i) *Application for certification and end-of-year reports.* Manufacturers participating in the emissions averaging, trading and banking program, shall submit for each participating test group the items listed in paragraphs (i)(1) through (3) of this section.

(1) *Application for certification.* (i) The application for certification will include a statement that the vehicles for which certification is requested will not, to the best of the manufacturer's belief, when included in the averaging, trading and banking program, cause the applicable NO_x emissions standard to be exceeded.

(ii) The application for certification will also include identification of the section of this subpart under which the test group is participating in the averaging, trading and banking program (e.g., § 86.1817-05), the type (NO_x), and the projected number of credits generated/needed for this test group, the applicable averaging set, the projected U.S. production volumes (excluding vehicles produced for sale in California), by quarter, and the values required to calculate credits as given in the applicable averaging, trading and banking section. Manufacturers shall also submit how and where credit surpluses are to be dispersed and how and through what means credit deficits are to be met, as explained in the applicable averaging, trading and banking section. The application must project that each test group will be in compliance with the applicable emission standards based on the vehicle mass emissions and credits from averaging, trading and banking.

(2) [Reserved]

(3) *End-of-year report.* The manufacturer shall submit end-of-year reports for each test group participating in the averaging, trading and banking program, as described in paragraphs (1)(3)(i) through (iv) of this section.

(i) These reports shall be submitted within 90 days of the end of the model year to: Director, Certification and Compliance Division, U.S. Environmental Protection Agency, Mail Code 6405J, 1200 Pennsylvania Ave., NW., 20460.

(ii) These reports shall indicate the test group, the averaging set, the actual U.S. production volume (excluding vehicles produced for sale in California), the values required to calculate credits as given in the applicable averaging, trading and banking section, and the resulting type and number of credits generated/required. Manufacturers shall also submit how and where credit surpluses were dispersed (or are to be banked) and how and through what means credit deficits were met. Copies of contracts related to credit trading must also be included or supplied by the broker if applicable. The report shall also include a calculation of credit balances to show that net mass emissions balances are within

those allowed by the emission standards (equal to or greater than a zero credit balance). Any credit discount factor described in the applicable averaging, trading and banking section must be included as required.

(iii) The production counts for end-of-year reports shall be based on the location of the first point of retail sale (e.g., customer, dealer, secondary manufacturer) by the manufacturer.

(iv) Errors discovered by EPA or the manufacturer in the end-of-year report, including changes in the production counts, may be corrected up to 180 days subsequent to submission of the end-of-year report. Errors discovered by EPA after 180 days shall be corrected if credits are reduced. Errors in the manufacturer's favor will not be corrected if discovered after the 180 day correction period allowed.

(j) *Failure to submit quarterly or end-of-year reports.* Failure by a manufacturer participating in the averaging, trading and banking program to submit any quarterly or end-of-year report (as applicable) in the specified time for all vehicles that are part of an averaging set is a violation of section 203(a)(1) of the Clean Air Act (42 U.S.C. 7522(a)(1)) for such vehicles.

(k) *Failure to submit end-of-year reports for banked credits.* Failure by a manufacturer generating credits for deposit only in the complete heavy-duty vehicle banking program to submit their end-of-year reports in the applicable specified time period (i.e., 90 days after the end of the model year) shall result in the credits not being available for use until such reports are received and reviewed by EPA. Use of projected credits pending EPA review will not be permitted in these circumstances.

(l) *Quarterly records.* Any manufacturer producing a test group participating in trading using reserved credits, shall maintain the following records on a quarterly basis for each test group in the trading subclass:

(1) The test group;

(2) The averaging set;

(3) The actual quarterly and cumulative U.S. production volumes excluding vehicles produced for sale in California;

(4) The values required to calculate credits as given in paragraph (c) of this section;

(5) The resulting type and number of credits generated/required;

(6) How and where credit surpluses are dispersed; and

(7) How and through what means credit deficits are met.

(m) *Additional flexibility for complete heavy-duty vehicles.* If a complete heavy-duty vehicle has a NO_x FEL of 0.6 grams per mile or lower, a discount of 1.0 may be used in the trading and banking credits calculation for NO_x described in paragraph (c)(2) of this section.

(n) *Early banking for complete heavy-duty vehicles.* Provisions set forth in paragraphs (a) through (m) of this section apply except as specifically stated otherwise in this paragraph (n).

(1) *Early banking eligibility.* To be eligible for the early banking program described in this paragraph, the following must apply:

(i) Credits are generated from complete heavy-duty vehicles.

(ii) During certification, the manufacturer shall declare its intent to include specific test groups in the early banking program described in this paragraph (n).

(2) *Credit generation and use.* (i) Early credits may be generated by test groups starting in model year 2000.

(ii) Credits may only be used for complete heavy-duty vehicles subject to chassis-based standards, except as provided by paragraph (o) in this section, and all credits shall be subject to discounting and all other provisions contained in paragraphs (a) through (m) of this section.

(o) *Credit transfers.* A manufacturer that elects to comply with Option 1 or 2 contained in § 86.005-10(f) may transfer credits between its complete vehicle averaging set and its heavy-duty Otto-cycle engine averaging set as follows:

(1) Credits earned in model years 2004 (2003 for Option 1) through 2007 are eligible to be transferred.

(2) Transferred credits may not be banked for use in model years 2008 and later. Credits that are transferred but not used prior to model year 2008 must be forfeited.

(3) Prior to transferring credits, a manufacturer must develop a methodology to transfer the credits including a conversion factor that may be used to convert between chassis-based credits (derived on a grams per mile basis) and equivalent engine-based credits (derived on a grams per brake horsepower-hour basis). The methodology must be approved by EPA prior to the start of the model year in which the credits are to be transferred. The conversion factor must provide reasonable certainty that the credits are equivalent for the specific vehicle test group(s) and engine family(s) involved in the generation and use of the credits.

[65 FR 59971, Oct. 6, 2000, as amended at 71 FR 2830, Jan. 17, 2006]

§ 86.1817-08 Complete heavy-duty vehicle averaging, trading, and banking program.

Section 86.1817-08 includes text that specifies requirements that differ from § 86.1817-05. Where a paragraph in § 86.1817-05 is identical and applicable to § 86.1817-08, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved].” For guidance see § 86.1817-05.” This section does not apply for NO_x or NMOG+NO_x emissions for vehicles certified to the Tier 3 standards in § 86.1816-18, including those vehicles that certify to the Tier 3 standards before model year 2018. See §§ 86.1860 and 86.1861 for provisions that apply for vehicles certified to the Tier 3 standards.

(a) through (o) [Reserved]. For guidance see § 86.1817-05.

(p) The following provisions apply for model year 2008 and later engines. These provisions apply instead of the provisions of paragraphs § 86.1817-05 (a) through (o) to the extent that they are in conflict.

(1) Manufacturers of Otto-cycle vehicles may participate in an NMHC averaging, banking and trading program to show compliance with the standards specified in § 86.1806-08. The generation and use of NMHC credits are subject to the same provisions in paragraphs § 86.1817-05 (a) through (o) that apply for NO_x credits, except as otherwise specified in this section.

(2) NO_x or NMHC (or NO_x plus NMHC) credits may be exchanged between heavy-duty Otto-cycle test groups certified to the engine standards of subpart A of this part and heavy-duty Otto-cycle test groups certified to the chassis standards of this subpart, subject to an 0.8 discount factor (e.g., 100 grams of NO_x credits generated from vehicles would be equivalent to 80 grams of NO_x credits if they are used in the engine program of subpart A of this part, and vice versa). Credits that were previously discounted when they were banked according to § 86.1817-05(c), are subject to an additional discount factor of 0.888 instead of the 0.8 discount factor otherwise required by this paragraph (p)(2). This results in a total discount of 0.8 ($0.9 \times 0.888 = 0.8$).

(3) Credits are to be rounded to the nearest one-hundredth of a Megagram.

(4) To calculate credits relative to the NO_x standards listed in § 86.1816-08 (a)(1)(iv)(A) or (a)(2)(iv)(A) (0.2 or 0.4 grams per mile, respectively) express the standard and FEL to the nearest one-hundredth of a gram per mile prior to calculating the credits. Thus, either 0.20 or 0.40 should be used as the value for “Std”.

(5) Credits generated for 2008 and later model year test groups are not discounted (except as specified in § 86.1817-05(c) and paragraph (p)(2) of this section), and do not expire.

(6) For the purpose of using or generating credits during a phase-in of new standards, a manufacturer may elect to split a test group into two subgroups: one which uses credits and one which generates credits. The manufacturer must indicate in the application for certification that the test group is to be split, and may assign the numbers and configurations of vehicles within the respective subfamilies at any time prior to the submission of the end-of-year report described in § 86.1817-05 (i)(3). Manufacturers certifying a split test group may label all of the vehicles within that test group with the same FELs: either with a NO_x FEL and an NMHC FEL, or with a single NO_x+NMHC FEL. The FEL(s) on the label will apply for all SEA or other compliance testing.

(7) Vehicles meeting all of the applicable standards of § 86.1816-08 prior to

model year 2008 may generate NMHC credits for use by 2008 or later test groups. Credits are calculated according to § 86.1817-05(c), except that the applicable FEL cap listed in § 86.1816-08(a)(1)(ii)(B) or (2)(ii)(B) applies instead of “Std” (the applicable standard).

[66 FR 5192, Jan. 18, 2001, as amended at 79 FR 23725, Apr. 28, 2014]

§ 86.1818-12 Greenhouse gas emission standards for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles.

(a) *Applicability.* (1) This section contains standards and other regulations applicable to the emission of the air pollutant defined as the aggregate group of six greenhouse gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. This section applies to 2012 and later model year LDV, LDT and MDPV, including multi-fuel vehicles, vehicles fueled with alternative fuels, hybrid electric vehicles, plug-in hybrid electric vehicles, electric vehicles, and fuel cell vehicles. Unless otherwise specified, multi-fuel vehicles must comply with all requirements established for each consumed fuel. The provisions of this section, except paragraph (c), also apply to clean alternative fuel conversions as defined in 40 CFR 85.502, of all model year light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles. Manufacturers that qualify as a small business according to the requirements of § 86.1801-12(j) are exempt from the emission standards in this section. Manufacturers that have submitted a declaration for a model year according to the requirements of § 86.1801-12(k) for which approval has been granted by the Administrator are conditionally exempt from the emission standards in paragraphs (c) through (e) of this section for the approved model year.

(2) The standards specified in this section apply only for testing at low-altitude conditions. However, manufacturers must submit an engineering evaluation indicating that common calibration approaches are utilized at high altitude. Any deviation from low altitude emission control practices

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must be included in the auxiliary emission control device (AECD) descriptions submitted at certification. Any AECD specific to high altitude requires engineering emission data for EPA evaluation to quantify any emission impact and determine the validity of the AECD.

(b) *Definitions.* For the purposes of this section, the following definitions shall apply:

(1) *Passenger automobile* means a motor vehicle that is a passenger automobile as that term is defined in 49 CFR 523.4.

(2) *Light truck* means a motor vehicle that is a non-passenger automobile as that term is defined in 49 CFR 523.5.

(3) Manufacturer has the meaning given by the Department of Transportation at 49 CFR 531.4.

(c) *Fleet average CO₂ standards for passenger automobiles and light trucks.* (1) For a given individual model year's production of passenger automobiles and light trucks, manufacturers must comply with a full useful life fleet average CO₂ standard calculated according to the provisions of this paragraph (c). Manufacturers must calculate separate full useful life fleet average CO₂ standards for their passenger automobile and light truck fleets, as those terms are defined in this section. Each manufacturer's fleet average CO₂ standards determined in this paragraph (c) shall be expressed in whole grams per mile, in the model year specified as applicable. Manufacturers eligible for and choosing to participate in the Temporary Leadtime Allowance Alternative Standards for qualifying manufacturers specified in paragraph (e) of this section shall not include vehicles subject to the Temporary Leadtime Allowance Alternative Standards in the calculations of their primary passenger automobile or light truck standards determined in this paragraph (c). Manufacturers shall demonstrate compliance with the applicable standards according to the provisions of § 86.1865.

(2) *Passenger automobiles—(i) Calculation of CO₂ target values for passenger automobiles.* A CO₂ target value shall be determined for each passenger automobile as follows:

(A) For passenger automobiles with a footprint of less than or equal to 41

square feet, the gram/mile CO₂ target value shall be selected for the appropriate model year from the following table:

Model year	CO ₂ target value (grams/mile)
2012	244.0
2013	237.0
2014	228.0
2015	217.0
2016	206.0
2017	195.0
2018	185.0
2019	175.0
2020	166.0
2021	157.0
2022	150.0
2023	143.0
2024	137.0
2025 and later	131.0

(B) For passenger automobiles with a footprint of greater than 56 square feet, the gram/mile CO₂ target value shall be selected for the appropriate model year from the following table:

Model year	CO ₂ target value (grams/mile)
2012	315.0
2013	307.0
2014	299.0
2015	288.0
2016	277.0
2017	263.0
2018	250.0
2019	238.0
2020	226.0
2021	215.0
2022	205.0
2023	196.0
2024	188.0
2025 and later	179.0

(C) For passenger automobiles with a footprint that is greater than 41 square feet and less than or equal to 56 square feet, the gram/mile CO₂ target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile, except that for any vehicle footprint the maximum CO₂ target value shall be the value specified for the same model year in paragraph (c)(2)(i)(B) of this section:

$$\text{Target CO}_2 = [a \times f] + b$$

Where:

f is the vehicle footprint, as defined in § 86.1803; and a and b are selected from the following table for the appropriate model year:

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Model year	a	b
2012	4.72	50.5
2013	4.72	43.3
2014	4.72	34.8
2015	4.72	23.4
2016	4.72	12.7
2017	4.53	8.9
2018	4.35	6.5
2019	4.17	4.2
2020	4.01	1.9
2021	3.84	–0.4
2022	3.69	–1.1
2023	3.54	–1.8
2024	3.4	–2.5
2025 and later	3.26	–3.2

(ii) *Calculation of the fleet average CO₂ standard for passenger automobiles.* In each model year manufacturers must comply with the CO₂ exhaust emission standard for their passenger automobile fleet, calculated for that model year as follows:

(A) A CO₂ target value shall be determined according to paragraph (c)(2)(i) of this section for each unique combination of model type and footprint value.

(B) Each CO₂ target value, determined for each unique combination of model type and footprint value, shall be multiplied by the total production of that model type/footprint combination for the appropriate model year.

(C) The resulting products shall be summed, and that sum shall be divided by the total production of passenger automobiles in that model year. The result shall be rounded to the nearest whole gram per mile. This result shall be the applicable fleet average CO₂ standard for the manufacturer's passenger automobile fleet.

(3) *Light trucks*—(i) *Calculation of CO₂ target values for light trucks.* A CO₂ target value shall be determined for each light truck as follows:

(A) For light trucks with a footprint of less than or equal to 41 square feet, the gram/mile CO₂ target value shall be selected for the appropriate model year from the following table:

Model year	CO ₂ target value (grams/mile)
2012	294.0
2013	284.0
2014	275.0
2015	261.0
2016	247.0
2017	238.0
2018	227.0
2019	220.0

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Model year	CO ₂ target value (grams/mile)
2020	212.0
2021	195.0
2022	186.0
2023	176.0
2024	168.0
2025 and later	159.0

(B) For light trucks with a footprint that is greater than 41 square feet and less than or equal to the maximum footprint value specified in the table below for each model year, the gram/mile CO₂ target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile, except that for any vehicle footprint the maximum CO₂ target value shall be the value specified for the same model year in paragraph (c)(3)(i)(D) of this section:

$$\text{Target CO}_2 = (a \times f) + b$$

Where:

f is the footprint, as defined in § 86.1803; and *a* and *b* are selected from the following table for the appropriate model year:

Model year	Maximum footprint	a	b
2012	66.0	4.04	128.6
2013	66.0	4.04	118.7
2014	66.0	4.04	109.4
2015	66.0	4.04	95.1
2016	66.0	4.04	81.1
2017	50.7	4.87	38.3
2018	60.2	4.76	31.6
2019	66.4	4.68	27.7
2020	68.3	4.57	24.6
2021	73.5	4.28	19.8
2022	74.0	4.09	17.8
2023	74.0	3.91	16.0
2024	74.0	3.74	14.2
2025 and later	74.0	3.58	12.5

(C) For light trucks with a footprint that is greater than the minimum footprint value specified in the table below and less than or equal to the maximum footprint value specified in the table below for each model year, the gram/mile CO₂ target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile, except that for any vehicle footprint the maximum CO₂ target value shall be the value specified for the same model year in paragraph (c)(3)(i)(D) of this section:

$$\text{Target CO}_2 = (a \times f) + b$$

Where:

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f is the footprint, as defined in § 86.1803; and
 a and b are selected from the following
table for the appropriate model year:

Model year	Minimum footprint	Maximum footprint	a	b
2017	50.7	66.0	4.04	80.5
2018	60.2	66.0	4.04	75.0

(D) For light trucks with a footprint greater than the minimum value specified in the table below for each model year, the gram/mile CO₂ target value shall be selected for the appropriate model year from the following table:

Model year	Minimum footprint	CO ₂ target value (grams/mile)
2012	66.0	395.0
2013	66.0	385.0
2014	66.0	376.0
2015	66.0	362.0
2016	66.0	348.0
2017	66.0	347.0
2018	66.0	342.0
2019	66.4	339.0
2020	68.3	337.0
2021	73.5	335.0
2022	74.0	321.0
2023	74.0	306.0
2024	74.0	291.0
2025 and later	74.0	277.0

(ii) *Calculation of fleet average CO₂ standards for light trucks.* In each model year manufacturers must comply with the CO₂ exhaust emission standard for their light truck fleet, calculated for that model year as follows:

(A) A CO₂ target value shall be determined according to paragraph (c)(3)(i) of this section for each unique combination of model type and footprint value.

(B) Each CO₂ target value, which represents a unique combination of model type and footprint value, shall be multiplied by the total production of that model type/footprint combination for the appropriate model year.

(C) The resulting products shall be summed, and that sum shall be divided by the total production of light trucks in that model year. The result shall be rounded to the nearest whole gram per mile. This result shall be the applicable fleet average CO₂ standard for the manufacturer's light truck fleet.

(4) *Emergency vehicles.* Emergency vehicles may be excluded from the emission standards described in this sec-

tion. The manufacturer must notify the Administrator that they are making such an election in the model year reports required under § 600.512 of this chapter. Such vehicles should be excluded from both the calculation of the fleet average standard for a manufacturer under this paragraph (c) and from the calculation of the fleet average carbon-related exhaust emissions in § 86.510-12.

(d) *In-use CO₂ exhaust emission standards.* The in-use CO₂ exhaust emission standard shall be the combined city/highway carbon-related exhaust emission value calculated for the appropriate vehicle carline/subconfiguration according to the provisions of § 600.113-12(g)(4) of this chapter multiplied by 1.1 and rounded to the nearest whole gram per mile. For in-use vehicle carlines/subconfigurations for which a combined city/highway carbon-related exhaust emission value was not determined under § 600.113-12(g)(4) of this chapter, the in-use CO₂ exhaust emission standard shall be the combined city/highway carbon-related exhaust emission value calculated according to the provisions of § 600.208 of this chapter for the vehicle model type (except that total model year production data shall be used instead of sales projections) multiplied by 1.1 and rounded to the nearest whole gram per mile. For vehicles that are capable of operating on multiple fuels, except plug-in hybrid electric vehicles, a separate in-use standard shall be determined for each fuel that the vehicle is capable of operating on. These standards apply to in-use testing performed by the manufacturer pursuant to regulations at §§ 86.1845 and 86.1846 and to in-use testing performed by EPA.

(e) *Temporary Lead Time Allowance Alternative Standards.* (1) The interim fleet average CO₂ standards in this paragraph (e) are optionally applicable to each qualifying manufacturer, where

the terms “sales” or “sold” as used in this paragraph (e) means vehicles produced for U.S. sale, where “U.S.” means the states and territories of the United States.

(i) A qualifying manufacturer is a manufacturer with sales of 2009 model year combined passenger automobiles and light trucks of greater than zero and less than 400,000 vehicles that elects to participate in the Temporary Leadtime Allowance Alternative Standards described in this paragraph (e).

(A) If a manufacturer sold less than 400,000 but more than zero 2009 model year combined passenger automobiles and light trucks while under the control of another manufacturer, where those 2009 model year passenger automobiles and light trucks bore the brand of the producing manufacturer, and where the producing manufacturer became independent no later than December 31, 2010, the producing manufacturer is a qualifying manufacturer.

(B) In the case where two or more qualifying manufacturers combine as the result of merger or the purchase of 50 percent or more of one or more companies by another company, and if the combined 2009 model year sales of the merged or combined companies is less than 400,000 but more than zero (combined passenger automobiles and light trucks), the corporate entity formed by the combination of two or more qualifying manufacturers shall continue to be a qualifying manufacturer, except the provisions of paragraph (e)(1)(i)(D) shall apply in the case where one of the merging companies elects to voluntarily opt out of the Temporary Leadtime Allowance Alternative Standards as allowed under paragraph (e)(1)(iv) of this section. The total number of vehicles that the corporate entity is allowed to include under the Temporary Leadtime Allowance Alternative Standards shall be determined by paragraph (e)(2) or (e)(3) of this section, where sales is the total combined 2009 model year sales of all of the merged or combined companies. Vehicles sold by the companies that combined by merger/acquisition to form the corporate entity that were subject to the Temporary Leadtime Allowance Alternative Standards in paragraph (e)(4) of

this section prior to the merger/acquisition shall be combined to determine the remaining number of vehicles that the corporate entity may include under the Temporary Leadtime Allowance Alternative Standards in this paragraph (e).

(C) In the case where two or more manufacturers combine as the result of merger or the purchase of 50 percent or more of one or more companies by another company, and if the combined 2009 model year sales of the merged or combined companies is equal to or greater than 400,000 (combined passenger automobiles and light trucks), the new corporate entity formed by the combination of two or more manufacturers is not a qualifying manufacturer. Such a manufacturer shall meet the emission standards in paragraph (c) of this section beginning with the model year that is numerically two years greater than the calendar year in which the merger/acquisition(s) took place.

(D) In the case where two or more manufacturers combine as the result of merger or the purchase of 50 percent or more of one or more companies by another company, where one of the manufacturers chooses to voluntarily opt out of the Temporary Leadtime Allowance Alternative Standards under the provisions of paragraph (e)(1)(iv) of this section, the new corporate entity formed by the combination of two or more manufacturers is not a qualifying manufacturer. Such a manufacturer shall meet the emission standards in paragraph (c) of this section beginning with the model year that is numerically two years greater than the calendar year in which the merger/acquisition(s) took place. If one or more of the merged or combined manufacturers was complying with the Temporary Leadtime Allowance Alternative Standards prior to the merger/com- bination, that manufacturer is no longer eligible for the Temporary Leadtime Allowance Alternative Standards beginning with the model year that is numerically two years greater than the calendar year in which the merger/acquisition(s) took

place. The cumulative number of vehicles that such a manufacturer may include in the Temporary Leadtime Allowance Alternative Standards, including those that were included by all merged manufacturers prior to the merger/acquisition, is limited to 100,000.

(ii) For the purposes of making the determination in paragraph (e)(1)(i) of this section, “manufacturer” shall mean that term as defined at 49 CFR 531.4 and as that definition was applied to the 2009 model year for the purpose of determining compliance with the 2009 corporate average fuel economy standards at 49 CFR parts 531 and 533.

(iii) A qualifying manufacturer may not use these Temporary Leadtime Allowance Alternative Standards until they have used all available banked credits and/or credits available for transfer accrued under § 86.1865–12(k). A qualifying manufacturer with a net positive credit balance calculated under § 86.1865–12(k) in any model year after considering all available credits either generated, carried forward from a prior model year, transferred from other averaging sets, or obtained from other manufacturers, may not use these Temporary Leadtime Allowance Alternative Standards in such model year.

(iv) In the event of a merger, acquisition, or combination with another manufacturer, a qualifying manufacturer that has not certified any vehicles to the Temporary Leadtime Allowance Alternative Standards in any model year may voluntarily opt out of the Temporary Leadtime Allowance Alternative Standards. A manufacturer making this election must notify EPA in writing of their intent prior to the end of the model year in which a merger or combination with another manufacturer becomes effective. The notification must indicate that the manufacturer is electing to not use the Temporary Leadtime Allowance Alternative Standards in any model year, and that any manufacturers that are either purchased by or merged with the manufacturer making this election must also meet the emission standards in paragraph (c) of this section beginning with the model year that is numerically two years greater than the

calendar year in which the merger/acquisition(s) took place.

(2) Qualifying manufacturers may select any combination of 2012 through 2015 model year passenger automobiles and/or light trucks to include under the Temporary Leadtime Allowance Alternative Standards determined in this paragraph (e) up to a cumulative total of 100,000 vehicles. Vehicles selected to comply with these standards shall not be included in the calculations of the manufacturer’s fleet average standards under paragraph (c) of this section.

(3)(i) Qualifying manufacturers with sales of 2009 model year combined passenger automobiles and light trucks in the United States of greater than zero and less than 50,000 vehicles may select any combination of 2012 through 2015 model year passenger automobiles and/or light trucks to include under the Temporary Leadtime Allowance Alternative Standards determined in this paragraph (e) up to a cumulative total of 200,000 vehicles, and additionally may select up to 50,000 2016 model year vehicles to include under the Temporary Leadtime Allowance Alternative Standards determined in this paragraph (e). To be eligible for the provisions of this paragraph (e)(3) qualifying manufacturers must provide annual documentation of good-faith efforts made by the manufacturer to purchase credits from other manufacturers. Without such documentation, the manufacturer may use the Temporary Leadtime Allowance Alternative Standards according to the provisions of paragraph (e)(2) of this section, and the provisions of this paragraph (e)(3) shall not apply. Vehicles selected to comply with these standards shall not be included in the calculations of the manufacturer’s fleet average standards under paragraph (c) of this section.

(ii) Manufacturers that qualify in the 2016 model year for the expanded Temporary Leadtime Allowance Alternative Standards described in paragraph (e)(3)(i) of this section, may, subject to certain restrictions, use an alternative compliance schedule that provides additional lead time to meet the standards in paragraph (c) of this section for the 2017 through 2020 model years.

§ 86.1818–12

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(A) The alternative compliance schedule is as follows. In lieu of the standards in paragraph (c) of this section that would otherwise be applicable to the model year shown in the first column of the table below, a qualifying manufacturer may comply with the standards in paragraph (c) of this section determined for the model year shown in the second column of the table. In the 2021 and later model years the manufacturer must meet the standards designated for each model year in paragraph (c) of this section.

Model year	Applicable standards
2017	2016
2018	2016
2019	2018
2020	2019

(B) A manufacturer using the alternative compliance schedule in paragraph (e)(3)(ii) of this section may not sell or otherwise transfer credits generated in years when the alternative phase-in is used to other manufacturers. Other provisions in § 86.1865 regarding credit banking, deficit carry-forward, and within-manufacturer transfers across fleets apply.

(4) To calculate the applicable Temporary Leadtime Allowance Alternative Standards, qualifying manufacturers shall determine the fleet average standard separately for the passenger automobiles and light trucks selected by the manufacturer to be subject to the Temporary Leadtime Allowance Alternative Standards, subject to the limitations expressed in paragraphs (e)(1) through (3) of this section.

(i) The Temporary Leadtime Allowance Alternative Standard applicable to qualified passenger automobiles as defined in § 600.002–08 of this chapter shall be the standard calculated using the provisions of paragraph (c)(2)(ii) of this section for the appropriate model year multiplied by 1.25 and rounded to the nearest whole gram per mile. For the purposes of applying paragraph (c)(2)(ii) of this section to determine the standard, the passenger automobile fleet shall be limited to those passenger automobiles subject to the Temporary Leadtime Allowance Alternative Standard.

(ii) The Temporary Leadtime Allowance Alternative Standard applicable

to qualified light trucks (*i.e.* non-passenger automobiles as defined in § 600.002–08 of this chapter) shall be the standard calculated using the provisions of paragraph (c)(3)(ii) of this section for the appropriate model year multiplied by 1.25 and rounded to the nearest whole gram per mile. For the purposes of applying paragraph (c)(3)(ii) of this section to determine the standard, the light truck fleet shall be limited to those light trucks subject to the Temporary Leadtime Allowance Alternative Standard.

(5) Manufacturers choosing to optionally apply these standards are subject to the restrictions on credit banking and trading specified in § 86.1865–12.

(f) *Nitrous oxide (N₂O) and methane (CH₄) exhaust emission standards for passenger automobiles and light trucks.* Each manufacturer's fleet of combined passenger automobiles and light trucks must comply with N₂O and CH₄ standards using either the provisions of paragraph (f)(1), (2), or (3) of this section. Except with prior EPA approval, a manufacturer may not use the provisions of both paragraphs (f)(1) and (2) of this section in a model year. For example, a manufacturer may not use the provisions of paragraph (f)(1) of this section for their passenger automobile fleet and the provisions of paragraph (f)(2) for their light truck fleet in the same model year. The manufacturer may use the provisions of both paragraphs (f)(1) and (3) of this section in a model year. For example, a manufacturer may meet the N₂O standard in paragraph (f)(1)(i) of this section and an alternative CH₄ standard determined under paragraph (f)(3) of this section. Vehicles certified using the N₂O data submittal waiver provisions of § 86.1829(b)(1)(iii)(G) are not required to be tested for N₂O under the in-use testing programs required by § 86.1845 and § 86.1846.

(1) *Standards applicable to each test group.* (i) Exhaust emissions of nitrous oxide (N₂O) shall not exceed 0.010 grams per mile at full useful life, as measured according to the Federal Test Procedure (FTP) described in subpart B of this part. Manufacturers may optionally determine an alternative N₂O standard under paragraph (f)(3) of this section. (ii) Exhaust emissions of

methane (CH₄) shall not exceed 0.030 grams per mile at full useful life, as measured according to the Federal Test Procedure (FTP) described in subpart B of this part. Manufacturers may optionally determine an alternative CH₄ standard under paragraph (f)(3) of this section.

(2) *Include N₂O and CH₄ in fleet averaging program.* Manufacturers may elect to not meet the emission standards in paragraph (f)(1) of this section. Manufacturers making this election shall include N₂O and CH₄ emissions in the determination of their fleet average carbon-related exhaust emissions, as calculated in 40 CFR part 600, subpart F. Manufacturers using this option must include both N₂O and CH₄ full useful life values in the fleet average calculations for passenger automobiles and light trucks. Use of this option will account for N₂O and CH₄ emissions within the carbon-related exhaust emission value determined for each model type according to the provisions of 40 CFR part 600. This option requires the determination of full useful life emission values for both the Federal Test Procedure and the Highway Fuel Economy Test. Manufacturers selecting this option are not required to demonstrate compliance with the standards in paragraph (f)(1) of this section.

(3) *Optional use of alternative N₂O and/or CH₄ standards.* Manufacturers may select an alternative standard applicable to a test group, for either N₂O or CH₄, or both. For example, a manufacturer may choose to meet the N₂O standard in paragraph (f)(1)(i) of this section and an alternative CH₄ standard in lieu of the standard in paragraph (f)(1)(ii) of this section. The alternative standard for each pollutant must be greater than the applicable exhaust emission standard specified in paragraph (f)(1) of this section. Alternative N₂O and CH₄ standards apply to emissions measured according to the Federal Test Procedure (FTP) described in Subpart B of this part for the full useful life, and become the applicable certification and in-use emission standard(s) for the test group. Manufacturers using an alternative standard for N₂O and/or CH₄ must calculate emission debits according to the provisions

of paragraph (f)(4) of this section for each test group/alternative standard combination. Debits must be included in the calculation of total credits or debits generated in a model year as required under § 86.1865-12(k)(5). For flexible fuel vehicles (or other vehicles certified for multiple fuels) you must meet these alternative standards when tested on any applicable test fuel type.

(4) *CO₂ equivalent debits.* CO₂-equivalent debits for test groups using an alternative N₂O and/or CH₄ standard as determined under paragraph (f)(3) of this section shall be calculated according to the following equation and rounded to the nearest whole megagram:

$$\text{Debits} = [\text{GWP} \times (\text{Production}) \times (\text{AltStd} - \text{Std}) \times \text{VLM}] / 1,000,000$$

Where:

Debits = N₂O or CH₄ CO₂-equivalent debits for a test group using an alternative N₂O or CH₄ standard;

GWP = 25 if calculating CH₄ debits and 298 if calculating N₂O debits;

Production = The number of vehicles of that test group domestically produced plus those imported as defined in § 600.511 of this chapter;

AltStd = The alternative standard (N₂O or CH₄) selected by the manufacturer under paragraph (f)(3) of this section;

Std = The exhaust emission standard for N₂O or CH₄ specified in paragraph (f)(1) of this section; and

VLM = 195,264 for passenger automobiles and 225,865 for light trucks.

(g) *Alternative fleet average standards for manufacturers with limited U.S. sales.* Manufacturers meeting the criteria in this paragraph (g) may request that the Administrator establish alternative fleet average CO₂ standards that would apply instead of the standards in paragraph (c) of this section. The provisions of this paragraph (g) are applicable only to the 2017 and later model years. A manufacturer that has sought and received EPA approval for alternative standards for the 2017 model year may, at their option, choose to comply with those standards in the 2015 and 2016 model years in lieu of requesting a conditional exemption under § 86.1801(k).

(1) *Eligibility for alternative standards.* Eligibility as determined in this paragraph (g) shall be based on the total

sales of combined passenger automobiles and light trucks. The terms “sales” and “sold” as used in this paragraph (g) shall mean vehicles produced for U.S. sale, where “U.S.” means the states and territories of the United States. For the purpose of determining eligibility the sales of related companies shall be aggregated according to the provisions of §86.1838-01(b)(3), or, if a manufacturer has been granted operational independence status under §86.1838(d), eligibility shall be based on vehicle production of that manufacturer. To be eligible for alternative standards established under this paragraph (g), the manufacturer’s average sales for the three most recent consecutive model years must remain below 5,000. If a manufacturer’s average sales for the three most recent consecutive model years exceeds 4999, the manufacturer will no longer be eligible for exemption and must meet applicable emission standards starting with the model year according to the provisions in this paragraph (g)(1).

(i) If a manufacturer’s average sales for three consecutive model years exceeds 4999, and if the increase in sales is the result of corporate acquisitions, mergers, or purchase by another manufacturer, the manufacturer shall comply with the emission standards described in paragraph (c) of this section, as applicable, beginning with the first model year after the last year of the three consecutive model years.

(ii) If a manufacturer’s average sales for three consecutive model years exceeds 4999 and is less than 50,000, and if the increase in sales is solely the result of the manufacturer’s expansion in vehicle production (not the result of corporate acquisitions, mergers, or purchase by another manufacturer), the manufacturer shall comply with the emission standards described in paragraph (c), of this section, as applicable, beginning with the second model year after the last year of the three consecutive model years.

(2) *Requirements for new entrants into the U.S. market.* New entrants are those manufacturers without a prior record of automobile sales in the United States and without prior certification to (or exemption from, under §86.1801-12(k)) greenhouse gas emission stand-

ards in §86.1818-12. In addition to the eligibility requirements stated in paragraph (g)(1) of this section, new entrants must meet the following requirements:

(i) In addition to the information required under paragraph (g)(4) of this section, new entrants must provide documentation that shows a clear intent by the company to actually enter the U.S. market in the years for which alternative standards are requested. Demonstrating such intent could include providing documentation that shows the establishment of a U.S. dealer network, documentation of work underway to meet other U.S. requirements (e.g., safety standards), or other information that reasonably establishes intent to the satisfaction of the Administrator.

(ii) Sales of vehicles in the U.S. by new entrants must remain below 5,000 vehicles for the first three model years in the U.S. market, and in subsequent years the average sales for any three consecutive years must remain below 5,000 vehicles. Vehicles sold in violation of these limits within the first five model years will be considered not covered by the certificate of conformity and the manufacturer will be subject to penalties on an individual-vehicle basis for sale of vehicles not covered by a certificate. In addition, violation of these limits will result in loss of eligibility for alternative standards until such point as the manufacturer demonstrates two consecutive model years of sales below 5,000 automobiles. After the first five model years, the eligibility provisions in paragraph (g)(1) of this section apply, where violating the sales thresholds is no longer a violation of the condition on the certificate, but is instead grounds for losing eligibility for alternative standards.

(iii) A manufacturer with sales in the most recent model year of less than 5,000 automobiles, but where prior model year sales were not less than 5,000 automobiles, is eligible to request alternative standards under this paragraph (g). However, such a manufacturer will be considered a new entrant and subject to the provisions regarding new entrants in this paragraph (g), except that the requirement to demonstrate an intent to enter the U.S.

market in paragraph (g)(2)(i) of this section shall not apply.

(3) *How to request alternative fleet average standards.* Eligible manufacturers may petition for alternative standards for up to five consecutive model years if sufficient information is available on which to base such standards.

(i) To request alternative standards starting with the 2017 model year, eligible manufacturers must submit a completed application no later than July 30, 2013.

(ii) To request alternative standards starting with a model year after 2017, eligible manufacturers must submit a completed request no later than 36 months prior to the start of the first model year to which the alternative standards would apply.

(iii) The request must contain all the information required in paragraph (g)(4) of this section, and must be signed by a chief officer of the company. If the Administrator determines that the content of the request is incomplete or insufficient, the manufacturer will be notified and given an additional 30 days to amend the request.

(4) *Data and information submittal requirements.* Eligible manufacturers requesting alternative standards under this paragraph (g) must submit the following information to the Environmental Protection Agency. The Administrator may request additional information as she deems appropriate. The completed request must be sent to the Environmental Protection Agency at the following address: Director, Compliance and Innovative Strategies Division, U.S. Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor, Michigan 48105.

(i) *Vehicle model and fleet information.*

(A) The model years to which the requested alternative standards would apply, limited to five consecutive model years.

(B) Vehicle models and projections of production volumes for each model year.

(C) Detailed description of each model, including the vehicle type, vehicle mass, power, footprint, powertrain, and expected pricing.

(D) The expected production cycle for each model, including new model introductions and redesign or refresh cycles.

(ii) *Technology evaluation information.*

(A) The CO₂ reduction technologies employed by the manufacturer on each vehicle model, or projected to be employed, including information regarding the cost and CO₂-reducing effectiveness. Include technologies that improve air conditioning efficiency and reduce air conditioning system leakage, and any “off-cycle” technologies that potentially provide benefits outside the operation represented by the Federal Test Procedure and the Highway Fuel Economy Test.

(B) An evaluation of comparable models from other manufacturers, including CO₂ results and air conditioning credits generated by the models. Comparable vehicles should be similar, but not necessarily identical, in the following respects: vehicle type, horsepower, mass, power-to-weight ratio, footprint, retail price, and any other relevant factors. For manufacturers requesting alternative standards starting with the 2017 model year, the analysis of comparable vehicles should include vehicles from the 2012 and 2013 model years, otherwise the analysis should at a minimum include vehicles from the most recent two model years.

(C) A discussion of the CO₂-reducing technologies employed on vehicles offered outside of the U.S. market but not available in the U.S., including a discussion as to why those vehicles and/or technologies are not being used to achieve CO₂ reductions for vehicles in the U.S. market.

(D) An evaluation, at a minimum, of the technologies projected by the Environmental Protection Agency in a final rulemaking as those technologies likely to be used to meet greenhouse gas emission standards and the extent to which those technologies are employed or projected to be employed by the manufacturer. For any technology that is not projected to be fully employed, explain why this is the case.

(iii) *Alternative fleet average CO₂ standards.* (A) The most stringent CO₂ level estimated to be feasible for each model, in each model year, and the technological basis for this estimate.

(B) For each model year, a projection of the lowest feasible sales-weighted fleet average CO₂ value, separately for passenger automobiles and light

trucks, and an explanation demonstrating that these projections are reasonable.

(C) A copy of any application, data, and related information submitted to NHTSA in support of a request for alternative Corporate Average Fuel Economy standards filed under 49 CFR Part 525.

(iv) *Information supporting eligibility.*

(A) U.S. sales for the three previous model years and projected sales for the model years for which the manufacturer is seeking alternative standards.

(B) Information regarding ownership relationships with other manufacturers, including details regarding the application of the provisions of § 86.1838–01(b)(3) regarding the aggregation of sales of related companies.

(5) *Alternative standards.* Upon receiving a complete application, the Administrator will review the application and determine whether an alternative standard is warranted. If the Administrator judges that an alternative standard is warranted, the Administrator will publish a proposed determination in the FEDERAL REGISTER to establish alternative standards for the manufacturer that the Administrator judges are appropriate. Following a 30 day public comment period, the Administrator will issue a final determination establishing alternative standards for the manufacturer. If the Administrator does not establish alternative standards for an eligible manufacturer prior to 12 months before the first model year to which the alternative standards would apply, the manufacturer may request an extension of the exemption under § 86.1801–12(k) or an extension of previously approved alternative standards, whichever may apply.

(6) *Restrictions on credit trading.* Manufacturers subject to alternative standards approved by the Administrator under this paragraph (g) may not trade credits to another manufacturer. Transfers between car and truck fleets within the manufacturer are allowed, and the carry-forward provisions for credits and deficits apply.

(h) *Mid-term evaluation of standards.* No later than April 1, 2018, the Administrator shall determine whether the standards established in paragraph (c)

of this section for the 2022 through 2025 model years are appropriate under section 202(a) of the Clean Air Act, in light of the record then before the Administrator. An opportunity for public comment shall be provided before making such determination. If the Administrator determines they are not appropriate, the Administrator shall initiate a rulemaking to revise the standards, to be either more or less stringent as appropriate.

(1) In making the determination required by this paragraph (h), the Administrator shall consider the information available on the factors relevant to setting greenhouse gas emission standards under section 202(a) of the Clean Air Act for model years 2022 through 2025, including but not limited to:

(i) The availability and effectiveness of technology, and the appropriate lead time for introduction of technology;

(ii) The cost on the producers or purchasers of new motor vehicles or new motor vehicle engines;

(iii) The feasibility and practicability of the standards;

(iv) The impact of the standards on reduction of emissions, oil conservation, energy security, and fuel savings by consumers;

(v) The impact of the standards on the automobile industry;

(vi) The impacts of the standards on automobile safety;

(vii) The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national harmonized program; and

(viii) The impact of the standards on other relevant factors.

(2) The Administrator shall make the determination required by this paragraph (h) based upon a record that includes the following:

(i) A draft Technical Assessment Report addressing issues relevant to the standard for the 2022 through 2025 model years;

(ii) Public comment on the draft Technical Assessment Report;

(iii) Public comment on whether the standards established for the 2022 through 2025 model years are appropriate under section 202(a) of the Clean Air Act; and

(iv) Such other materials the Administrator deems appropriate.

(3) No later than November 15, 2017, the Administrator shall issue a draft Technical Assessment Report addressing issues relevant to the standards for the 2022 through 2025 model years.

(4) The Administrator will set forth in detail the bases for the determination required by this paragraph (h), including the Administrator's assessment of each of the factors listed in paragraph (h)(1) of this section.

[75 FR 25686, May 7, 2010, as amended at 76 FR 19874, Apr. 8, 2011; 76 FR 39521, July 6, 2011; 76 FR 57377, Sept. 15, 2011; 77 FR 63156, Oct. 15, 2012; 79 FR 23725, Apr. 28, 2014]

§ 86.1819 [Reserved]

§ 86.1820-01 Durability group determination.

This section applies to the grouping of vehicles into durability groups. Manufacturers shall divide their product line into durability groups based on the following criteria:

(a) The vehicles covered by a certification application shall be divided into groups of vehicles which are expected to have similar emission deterioration and emission component durability characteristics throughout their useful life. Manufacturers shall use good engineering judgment in dividing their vehicles into durability groups. Such groups of vehicles are defined as durability groups.

(b) To be included in the same durability group, vehicles must be identical in all the respects listed in paragraphs (b)(1) through (7) of this section:

(1) Combustion cycle (e.g., two stroke, four stroke, Otto cycle, diesel cycle).

(2) Engine type (e.g., piston, rotary, turbine, air cooled versus water cooled).

(3) Fuel used (e.g., gasoline, diesel, methanol, ethanol, CNG, LPG, flexible fuels).

(4) Basic fuel metering system (e.g., throttle body injection, port injection (including central port injection), carburetor, CNG mixer unit).

(5) Catalyst construction (for example, beads or monolith).

(6) Precious metal composition of the catalyst by the type of principal active

material(s) used (e.g., platinum based oxidation catalyst, palladium based oxidation catalyst, platinum and rhodium three-way catalyst, palladium and rhodium three way catalyst, platinum and palladium and rhodium three way catalyst).

(7) The manufacturer must choose one of the following two criteria:

(i) Grouping statistic:

(A) Vehicles are grouped based upon the value of the grouping statistic determined using the following equation:

$$GS = [(Cat\ Vol)/(Disp)] \times Loading\ Rate$$

Where:

GS = Grouping Statistic used to evaluate the range of precious metal loading rates and relative sizing of the catalysts compared to the engine displacement that are allowable within a durability group. The grouping statistic shall be rounded to a tenth of a gram/liter, in accordance with the Rounding-Off Method specified in ASTM E29-93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications (incorporated by reference, see § 86.1).

Cat Vol = Total volume of the catalyst(s) in liters.

Disp = Displacement of the engine in liters.

Loading rate = The mass of total precious metal(s) in the catalyst (or the total mass of all precious metal(s) of all the catalysts if the vehicle is equipped with multiple catalysts) in grams divided by the total volume of the catalyst(s) in liters.

(B) Engine-emission control system combinations which have a grouping statistic which is either less than 25 percent of the largest grouping statistic value, or less than 0.2 g/liter (whichever allows the greater coverage of the durability group) shall be grouped into the same durability group.

(ii) The manufacturer may elect to use another procedure which results in at least as many durability groups as required using criteria in paragraph (b)(7)(i) of this section providing that only vehicles with similar emission deterioration or durability are combined into a single durability group.

(c) Where vehicles are of a type which cannot be divided into durability groups based on the criteria listed above (such as non-catalyst control system approaches), the Administrator

will establish durability groups for those vehicles based upon the features most related to their exhaust emission deterioration characteristics.

(d) Manufacturers may further divide groups determined under paragraph (b) of this section provided the Administrator is notified of any such changes prior to or concurrently with the submission of the application for certification (preferably at an annual preview meeting scheduled before the manufacturer begins certification activities for the model year).

(e) Manufacturers may request the Administrator's approval to combine vehicles into a single durability group which would normally not be eligible to be in a single durability group. The petition should provide:

(1) Substantial evidence that all the vehicles in the larger grouping will have the same degree of emission deterioration;

(2) Evidence of equivalent component durability over the vehicle's useful life; and

(3) Evidence that the groups will result in sufficient In-Use Verification Program data, appropriate tracking in use, and clear liability for the Agency's recall program.

§ 86.1821-01 Evaporative/refueling family determination.

(a) The gasoline-, ethanol-, methanol-, liquefied petroleum gas-, and natural gas-fueled vehicles described in a certification application will be divided into groupings expected to have similar evaporative and/or refueling emission characteristics (as applicable) throughout their useful life. Each group of vehicles with similar evaporative and/or refueling emission characteristics shall be defined as a separate evaporative/refueling family. Manufacturers shall use good engineering judgment to determine evaporative/refueling families.

(b) For vehicles that operate on volatile liquid fuels to be classed in the same evaporative/refueling family, they must be similar with respect to all the following items:

(1) Type of vapor storage device (e.g., canister, air cleaner, crankcase).

(2) Basic canister design.

(i) Working capacity—grams adsorption within a 10 g. range.

(ii) System configuration—number of canisters and method of connection (i.e., series, parallel).

(iii) Canister geometry, construction and materials.

(3) Fuel system.

(4) Type of refueling emission control system—non-integrated or integrated with the evaporative control system. Further, if the system is non-integrated, whether or not any other evaporative emissions, e.g. diurnal or hot soak emissions, are captured in the same storage device as the refueling emissions.

(5) Fillpipe seal mechanism—mechanical, liquid trap, other.

(6) Vapor control system or method of controlling vapor flow through the vapor line to the canister (for example, type of valve, vapor control strategy).

(7) Purge control system (for example, type of valve, purge control strategy).

(8) Vapor hose material.

(9) Fuel tank material.

(10) Evaporative emission standard or family emission limit (FEL).

(c) Where vehicles are of a type which cannot be divided into evaporative/refueling families based on the criteria listed above (such as non-canister control system approaches), the Administrator will establish families for those vehicles based upon the features most related to their evaporative and/or refueling emission characteristics.

(d) Manufacturers may further divide families determined under paragraph (b) of this section provided the Administrator is notified of any such changes prior to or concurrently with the submission of the application for certification (preferably at an annual preview meeting scheduled before the manufacturer begins certification activities for the model year).

(e) Manufacturers may petition the Administrator to combine vehicles into a single evaporative/refueling family which would normally not be eligible to be in a single evaporative/refueling family. The petition should provide:

(1) Substantial evidence that all the vehicles in the larger grouping will

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have the same degree of evaporative emission deterioration;

(2) Evidence of equivalent component durability over the vehicle's useful life; and

(3) Evidence that the groups will result in sufficient In-Use Verification Program data, appropriate tracking in use, and clear liability for the Agency's recall program.

(f) For vehicles to be classed in the same leak family, they must be similar with respect to the items listed in paragraph (b) of this section and use the same OBD method for detecting leaks.

[64 FR 23925, May 4, 1999, as amended at 79 FR 23725, Apr. 28, 2014]

§ 86.1822-01 Durability data vehicle selection.

(a) Within each durability group, the vehicle configuration which is expected to generate the highest level of exhaust emission deterioration on candidate vehicles in use, considering all constituents, shall be selected as the durability data vehicle configuration. The manufacturer will use good engineering judgment in making this selection.

(b) The manufacturer may select, using good engineering judgment, an equivalent or worst-case configuration in lieu of testing the vehicle selected in paragraph (a) of this section. Carryover data satisfying the provisions of § 86.1839-01 may also be used in lieu of testing the configuration selected in paragraph (a) of this section.

§ 86.1823-01 Durability demonstration procedures for exhaust emissions.

This section applies to light-duty vehicles, light-duty trucks, complete heavy-duty vehicles, and heavy-duty vehicles certified under the provisions of § 86.1801-01(c). Eligible small volume manufacturers or small volume test groups may optionally meet the requirements of §§ 86.1838-01 and 86.1826-01 in lieu of the requirements of this section. For model years 2001, 2002, and 2003 all manufacturers may elect to meet the provisions of paragraph (c)(2) of this section in lieu of these requirements for light-duty vehicles or light-duty trucks.

(a) The manufacturer shall propose a durability program consisting of the

elements discussed in paragraphs (a)(1) through (a)(3) of this section for advance approval by the Administrator. The durability process shall be designed to effectively predict the expected deterioration of candidate in-use vehicles over their full and intermediate useful life and shall be consistent with good engineering judgment. The Administrator will approve the program if he/she determines that it is reasonably expected to meet these design requirements.

(1) *Service accumulation method.* (i) Each durability program shall include a service accumulation method designed to effectively predict the deterioration of emissions in actual use over the full and intermediate useful life of candidate in-use vehicles.

(ii) Manufacturers may propose service accumulation methods based upon whole-vehicle full-mileage accumulation, whole vehicle accelerated mileage accumulation (e.g., where 40,000 miles on a severe mileage accumulation cycle is equivalent to 100,000 miles of normal in-use driving), bench aging of individual components or systems, or other approaches approved by the Administrator.

(A) For whole vehicle mileage accumulation programs, all emission control components and systems (including both hardware and software) must be installed and operating for the entire mileage accumulation period.

(B) Bench procedures shall simulate the aging of components or systems over the applicable useful life and shall simulate driving patterns and vehicle operational environments found in actual use. For this purpose, manufacturers may remove the emission-related components (and other components), in whole or in part, from the durability vehicle itself and deteriorate them independently. Vehicle testing for the purpose of determining deterioration factors may include the testing of durability vehicles that incorporate such bench-aged components.

(2) *Vehicle/component selection method.* The manufacturer shall propose a vehicle/component selection method for advance approval by the Administrator. The procedure for selecting durability data vehicles and components shall meet the requirements of § 86.1822-01.

(3) *Use of deterioration program to determine compliance with the standard.* The manufacturer shall propose procedures for the determination of compliance with the standards for advance approval by the Administrator. The calculation of deterioration factors and/or the determination of vehicle compliance shall be according to the procedures approved in advance by the Administrator. The Administrator will allow two methods for using the results of the deterioration program to determine compliance with the standards. Either a deterioration factor (DF) is calculated and applied to the emission data vehicle (EDV) emission results or aged components are installed on the EDV prior to emission testing. Other methods may be approved by the Administrator if they result in an effective prediction of intermediate and full useful life emission levels on candidate in-use vehicles.

(i) *Use of deterioration factors.* (A) Deterioration factors are calculated using all FTP emission test data generated during the durability testing program except as noted:

(1) Multiple tests at a given mileage point are averaged together unless the same number of tests are conducted at each mileage point.

(2) Before and after maintenance test results are averaged together.

(3) Zero-mile test results are excluded from the calculation.

(4) When calculating intermediate and full useful life deterioration factors all data points should be included in the calculations, except that total hydrocarbon (THC) test points beyond the 50,000-mile (useful life) test point shall not be included in the calculations.

(5) A procedure may be employed to identify and remove from the DF calculation those test results determined to be statistical outliers providing that the outlier procedure is consistently applied to all vehicles and data points and is approved in advance by the Administrator.

(B) The deterioration factor shall be based on a linear regression, or an other regression technique approved in advance by the Administrator. The deterioration may be a multiplicative or additive factor. Separate factors will

be calculated for each regulated emission constituent and for the full and intermediate useful life periods as applicable. Separate DF's are calculated for each durability group except as provided in paragraph (c) of this section.

(1) A multiplicative DF will be calculated by taking the ratio of the full or intermediate useful life mileage level, as appropriate (rounded to four decimal places), divided by the stabilized mileage (reference § 86.1831-01(c), e.g., 4000-mile) level (rounded to four decimal places) from the regression analysis; the result shall be rounded to three-decimal places of accuracy. The rounding required in this paragraph shall be conducted in accordance with the Rounding-Off Method specified in ASTM E29-93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications (incorporated by reference, see § 86.1). Calculated DF values of less than one shall be changed to one for the purposes of this paragraph.

(2) An additive DF will be calculated to be the difference between the full or intermediate useful life mileage level (as appropriate) minus the stabilized mileage (reference § 86.1831-01(c), e.g., 4000-mile) level from the regression analysis. The full useful life regressed emission value, the stabilized mileage regressed emission value, and the DF result shall be rounded to the same precision and using the same procedures as the raw emission results according to the provisions of § 86.1837-01. Calculated DF values of less than zero shall be changed to zero for the purposes of this paragraph.

(C) The DF calculated by these procedures will be used for determining compliance with FTP exhaust emission standards, SFTP exhaust emission standards, cold temperature NMHC emission standards, and cold temperature CO emission standards. At the manufacturer's option and using procedures approved by the Administrator, a separate DF may be calculated exclusively using cold temperature CO test data to determine compliance with cold temperature CO emission standards. Similarly, at the manufacturer's option and using procedures approved by the Administrator, a separate DF may be calculated exclusively using

cold temperature NMHC test data to determine compliance with cold temperature NMHC emission standards. For determining compliance with full useful life cold temperature NMHC emission standards, the 68–86°F 120,000 mile full useful life NMOG DF may be used. Also at the manufacturer's option and using procedures approved by the Administrator, a separate DF may be calculated exclusively using US06 and/or air conditioning (SC03) test data to determine compliance with the SFTP emission standards.

(ii) *Installation of aged components on emission data vehicles.* For full and intermediate useful life compliance determination, the manufacturer may elect to install aged components on an EDV rather than applying a deterioration factor. Different sets of components may be aged for full and intermediate useful life periods. The list of components to be installed, the techniques used to select physical parts to be aged, and the aging techniques employed to age the components must be approved in advance by the Administrator.

(b) In addition to the provisions of paragraph (a) of this section, manufacturers shall submit the following information when applying for the Administrator's approval of a durability program:

(1) Analysis and/or data demonstrating the adequacy of the manufacturer's durability processes to effectively predict emission compliance for candidate in-use vehicles. All regulated emission constituents and all test procedures shall be considered in this analysis. This data and discussion shall cover the breadth of the manufacturer's product line that will be covered by this durability procedure.

(2) Discussion of the manufacturer's in-use verification procedures including testing performed, vehicle procurement procedures used, and vehicles rejection criteria used. Any questionnaires used or inspections performed should also be documented in the manufacturer's submission. The in-use verification program shall meet the requirements of §§ 86.1845-01, 86.1846-01 and 86.1847-01.

(c) *Carryover and carryacross.* (1) Manufacturers may carry over or carry

across mileage accumulation data, aged hardware, or deterioration factors according to the provisions of § 86.1839-01 using good engineering judgment.

(2) For the 2001, 2002, and 2003 model years, for light-duty vehicles and light-duty trucks the manufacturer may carry over exhaust emission DF's previously generated under the Standard AMA Durability Program described in § 86.094-13(c), the Alternate Service Accumulation Durability Program described in § 86.094-13(e) or the Standard Self-Approval Durability Program for light-duty trucks described in § 86.094-13(f) in lieu of complying with the durability provisions of paragraph (a)(1) of this section.

(i) This provision is limited to the use of existing data used for a 2000 model year or earlier certification. All new exhaust durability data must be generated according to the provisions of paragraph (a)(1) of this section.

(ii) The manufacturer shall exercise good engineering judgment when determining the eligibility to use carryover exhaust emission DF's and the selection of the vehicle used as the source of carryover.

(iii) Starting with the 2004 model year, manufacturers must meet the provisions of paragraphs (a) and (b) of this section.

(d) *Data reporting requirements.* Data reporting requirements are contained in § 86.1844-01.

(e) *Emission component durability.* The manufacturer shall use good engineering judgment to determine that all emission-related components are designed to operate properly for the full useful life of the vehicles in actual use.

(f) *In-use verification.* The durability program must meet the requirements of § 86.1845-01.

(g) The manufacturer shall apply the approved durability process to a durability group, including durability groups in future model years, if the durability process will effectively predict (or alternatively, overstate) the deterioration of emissions in actual use over the full and intermediate useful life of candidate in-use vehicles. The manufacturer shall use good engineering judgment in determining the applicability of the durability program to a durability group.

(1) The manufacturer may make modifications to an approved durability process using good engineering judgment for the purpose of ensuring that the modified process will effectively predict, (or alternatively, overstate) the deterioration of emissions in actual use over the full and intermediate useful life of candidate in-use vehicles.

(2) The manufacturer shall notify the Administrator of its determination to use an approved (or modified) durability program on particular test groups and durability groups prior to emission data vehicle testing for the affected test groups (preferably at an annual preview meeting scheduled before the manufacturer begins certification activities for the model year).

(3) Prior to certification, the Administrator may reject the manufacturer's determination in paragraph (g) of this section if it is not made using good engineering judgment or it fails to properly consider data collected under the provisions of §§ 86.1845-01, 86.1846-01, and 86.1847-01 or other information if the Administrator determines that the durability process has not been shown to effectively predict emission levels or compliance with the standards in use on candidate vehicles for particular test groups which the manufacturers plan to cover with the durability process.

(h) The Administrator may withdraw approval to use a durability process or require modifications to a durability process based on the data collected under §§ 86.1845-01, 86.1846-01, and 86.1847-01 or other information if the Administrator determines that the durability processes have not been shown to accurately predict emission levels or compliance with the standards (or FEL, as applicable) in use on candidate vehicles (provided the inaccuracy could result in a lack of compliance with the standards for a test group covered by this durability process). Such withdrawals shall apply to future applications for certification and to the portion of the manufacturer's product line (or the entire product line) that the Administrator determines to be affected. Prior to such a withdrawal the Administrator shall give the manufacturer a preliminary notice at least 60

days prior to the final decision. During this period, the manufacturer may submit technical discussion, statistical analyses, additional data, or other information which is relevant to the decision. The Administrator will consider all information submitted by the deadline before reaching a final decision.

(i) Any manufacturer may request a hearing on the Administrator's withdrawal of approval in paragraph (h) of this section. The request shall be in writing and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objection. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, she/he shall provide the manufacturer a hearing in accordance with § 86.1853-01 with respect to such issue.

[64 FR 23925, May 4, 1999, as amended at 65 FR 59974, Oct. 6, 2000; 72 FR 8566, Feb. 26, 2007]

§ 86.1823-08 Durability demonstration procedures for exhaust emissions.

This section describes durability demonstration procedures for exhaust emissions. Eligible small-volume manufacturers or small-volume test groups may optionally meet the requirements of §§ 86.1826 and 86.1838 instead of the requirements of paragraphs (a) through (m) of this section. A separate durability demonstration is required for each durability group.

(a) *Durability program objective.* The durability program must predict an expected in-use emission deterioration rate and emission level that effectively represents a significant majority of the distribution of emission levels and deterioration in actual use over the full and intermediate useful life of candidate in-use vehicles of each vehicle design which uses the durability program.

(b) *Required durability demonstration.* Manufacturers must conduct a durability demonstration for each durability group using a procedure specified in either paragraph (c), (d), or (e) of this section.

(c) *Standard whole-vehicle durability procedure.* This procedure consists of conducting mileage accumulation and

periodic testing on the durability data vehicle, selected under the provisions of § 86.1822 described as follows:

(1) Mileage accumulation must be conducted using the standard road cycle (SRC). The SRC is described in appendix V of this part.

(i) Mileage accumulation on the SRC may be conducted on a track or on a chassis mileage accumulation dynamometer. Alternatively, the entire engine and emission control system may be aged on an engine dynamometer using methods that will replicate the aging that occurs on the road for that vehicle following the SRC.

(ii) The fuel used for mileage accumulation must comply with the mileage accumulation fuel provisions of § 86.113 for the applicable fuel type (e.g., gasoline or diesel fuel).

(iii) The DDV must be ballasted to a minimum of the loaded vehicle weight for light-duty vehicles and light light-duty trucks and a minimum of the ALVW for all other vehicles.

(iv) The mileage accumulation dynamometer must be setup as follows:

(A) The simulated test weight will be the equivalent test weight specified in § 86.129 using a weight basis of the loaded vehicle weight for light-duty vehicles and ALVW for all other vehicles.

(B) The road force simulation will be determined according to the provisions of § 86.129.

(C) The manufacturer will control the vehicle, engine, and/or dynamometer as appropriate to follow the SRC using good engineering judgement.

(2) Mileage accumulation must be conducted for at least 75% of the applicable full useful life mileage period specified in § 86.1805. If the mileage accumulation is less than 100% of the full useful life mileage, then the DF calculated according to the procedures of paragraph (f)(1)(ii) of this section must be based upon a line projected to the full-useful life mileage using the upper 80 percent statistical confidence limit calculated from the emission data.

(3) If a manufacturer elects to calculate a DF pursuant to paragraph (f)(1) of this section, then it must conduct at least one FTP emission test at each of five different mileage points selected using good engineering judgement. Additional testing may be con-

ducted by the manufacturer using good engineering judgement. The required testing must include testing at 5,000 miles and at the highest mileage point run during mileage accumulation (e.g. the full useful life mileage). Different testing plans may be used providing that the manufacturer determines, using good engineering judgement, that the alternative plan would result in an equivalent or superior level of confidence in the accuracy of the DF calculation compared to the testing plan specified in this paragraph.

(d) *Standard bench-aging durability procedure.* This procedure is not applicable to diesel fueled vehicles or vehicles which do not use a catalyst as the principle after-treatment emission control device. This procedure requires installation of the catalyst-plus-oxygen-sensor system on a catalyst aging bench. Aging on the bench is conducted by following the standard bench cycle (SBC) for the period of time calculated from the bench aging time (BAT) equation. The BAT equation requires, as input, catalyst time-at-temperature data measured on the SRC.

(1) *Standard bench cycle (SBC).* Standard catalyst bench aging is conducted following the SBC

(i) The SBC must be run for the period of time calculated from the BAT equation.

(ii) The SBC is described in appendix VII to part 86.

(2) *Catalyst time-at-temperature data* (i) Catalyst temperature must be measured during at least two full cycles of the SRC.

(ii) Catalyst temperature must be measured at the highest temperature location in the hottest catalyst on the DDV. Alternatively, the temperature may be measured at another location providing that it is adjusted to represent the temperature measured at the hottest location using good engineering judgement.

(iii) Catalyst temperature must be measured at a minimum rate of one hertz (one measurement per second).

(iv) The measured catalyst temperature results must be tabulated into a histogram with temperature bins of no larger than 25°C.

(3) *Bench-aging time.* Bench aging time is calculated using the bench aging time (BAT) equation as follows:

$$t_e \text{ for a temperature bin} = t_h \cdot e^{((R/T_r) - (R/T_v))}$$

Total t_e = Sum of t_e over all the temperature bins

Bench-Aging Time = A (Total t_e)

Where:

A = 1.1 This value adjusts the catalyst aging time to account for deterioration from sources other than thermal aging of the catalyst.

R = Catalyst thermal reactivity coefficient. For the SBC, R=17500 for Tier 2 vehicles and R=18500 for all other vehicles.

t_h = The time (in hours) measured within the prescribed temperature bin of the vehicle's catalyst temperature histogram adjusted to a full useful life basis e.g., if the histogram represented 400 miles, and full useful life was 100,000 miles; all histogram time entries would be multiplied by 250 (100000/400).

Total t_e = The equivalent time (in hours) to age the catalyst at the temperature of T_r on the catalyst aging bench using the catalyst aging cycle to produce the same amount of deterioration experienced by the catalyst due to thermal deactivation over the vehicle's full useful life.

t_e for a bin = The equivalent time (in hours) to age the catalyst at the temperature of T_r on the catalyst aging bench using the catalyst aging cycle to produce the same amount of deterioration experienced by the catalyst due to thermal deactivation at the temperature bin of T_v over the vehicle's full useful life.

T_r = The effective reference temperature (in°K) of the catalyst on the catalyst bench run on the bench aging cycle. The effective temperature is the constant temperature that would result in the same amount of aging as the various temperatures experienced during the bench aging cycle.

T_v = The mid-point temperature (in°K) of the temperature bin of the vehicle on-road catalyst temperature histogram.

(4) *Effective reference temperature on the SBC.* The effective reference temperature of the standard bench cycle (SBC) is determined for the actual catalyst system design and actual aging bench which will be used using the following procedures:

(i) Measure time-at-temperature data in the catalyst system on the catalyst aging bench following the SBC.

(A) Catalyst temperature must be measured at the highest temperature location of the hottest catalyst in the system. Alternatively, the temperature may be measured at another location providing that it is adjusted to represent the temperature measured at the hottest location using good engineering judgement.

(B) Catalyst temperature must be measured at a minimum rate of one hertz (one measurement per second) during at least 20 minutes of bench aging.

(C) The measured catalyst temperature results must be tabulated into a histogram with temperature bins of no larger than 10°C.

(ii) The BAT equation must be used to calculate the effective reference temperature by iterative changes to the reference temperature (T_r) until the calculated aging time equals the actual time represented in the catalyst temperature histogram. The resulting temperature is the effective reference temperature on the SBC for that catalyst system and aging bench.

(5) *Catalyst Aging Bench.* The manufacturer must design, using good engineering judgement, a catalyst aging bench that follows the SBC and delivers the appropriate exhaust flow, exhaust constituents, and exhaust temperature to the face of the catalyst.

(i) A manufacturer may use the criteria and equipment discussed in appendix VIII to part 86 to develop its catalyst aging bench without prior Agency approval. The manufacturer may use another design that results in equivalent or superior results with advance Agency approval.

(ii) All bench aging equipment and procedures must record appropriate information (such as measured A/F ratios and time-at-temperature in the catalyst) to assure that sufficient aging has actually occurred.

(6) *Required Testing.* If a manufacturer is electing to calculate a DF (as discussed in paragraph (f)(1) of this section), then it must conduct at least two FTP emissions tests on the DDV before bench aging of emission control hardware and at least two FTP emission tests on the DDV after the bench-aged emission hardware is re-installed. Additional testing may be conducted by the manufacturer using good engineering judgement.

(e) *Additional durability procedures—*

(1) *Whole vehicle durability procedures.* A manufacturer may use either a customized SRC or an alternative road cycle for the required durability demonstration, with prior EPA approval.

(i) *Customized SRC.* A customized SRC is the SRC run for a different number of miles and/or using a different mileage accumulation fuel with higher levels of certain compounds that may lead to catalyst poisoning, such as phosphorus, sulfur and lead, than specified in paragraph (c)(1)(ii) of this section.

(ii) *Alternative road cycle.* An alternative cycle is a whole vehicle mileage accumulation cycle that uses a different speed-versus-time trace than the SRC, conducted for either the full useful life mileage or for less than full useful life mileage. An alternative road cycle may also include the use of fuel with higher levels of certain compounds that may lead to catalyst poisoning, such as phosphorus, sulfur and lead, than specified in paragraph (c)(1)(ii) of this section.

(iii) *Approval criteria.* The manufacturer must obtain approval from EPA prior to using a customized/alternative road cycle. EPA may approve a customized/alternative cycle when the manufacturer demonstrates that the cycle is expected to achieve the durability program objective of paragraph (a) of this section for the breadth of vehicles using the customized/alternative cycle. To obtain approval the manufacturer must submit all the following information and perform all the following analyses:

(A) The manufacturer must supply in-use FTP emission data on past model year vehicles which are applicable to the vehicle designs it intends to cover with the customized/alternative cycle.

(1) The amount of in-use emission data required to demonstrate the effectiveness of a customized/alternative cycle in meeting the durability objective is based on whether the customized/alternative cycle is more or less severe than the SRC. In most cases, EPA will accept a minimum of 20 candidate in-use vehicles tested as-received on the FTP cycle. If the customized/alternative cycle is significantly more severe than the SRC, EPA may accept less data. Conversely, if the customized/alternative cycle is significantly less severe than the SRC, EPA may require more data, up to a maximum of 30 vehicles.

(2) This data set must consist of randomly procured vehicles from actual customer use. The vehicles selected for procurement must cover the breadth of the vehicles that the manufacturer intends to certify using the customized/alternative cycle. Vehicles should be procured and FTP tested in as-received condition under the guidelines of the high mileage IUVP program (ref: 40 CFR 86.1845-04).

(3) Manufacturers may use previously generated in-use data from the CAP 2000 IUVP or the RDP "reality check" in-use program as well as other sources of in-use emissions data for approval under this section.

(4) Manufacturers must remove unrepresentative data from the data set using good engineering judgement. The manufacturer must provide EPA with the data removed from the analysis and a justification for the removal of that data.

(5) Manufacturers may supply additional in-use data.

(B) The manufacturer must submit an analysis which includes a comparison of the relative stringency of the customized/alternative cycle to the SRC and a calculated equivalency factor for the cycle.

(1) The equivalency factor may be determined by an evaluation of the SRC and the customized/alternative cycle using catalyst time-at-temperature data from both cycles with the BAT equation to calculate the required bench aging time of each cycle. Once the bench aging time is calculated for each cycle, the equivalency factor is the ratio described by dividing the

bench aging time on the customized/alternative cycle by the bench aging time on the SRC.

(2) If emissions data is available from the SRC, as well as time-at-temperature data, then that emissions information may be included in the evaluation of the relative stringency of the two cycles and the development of the equivalency factor.

(3) A separate equivalency factor may be determined for each test group, or test groups may be combined together (using good engineering judgement) to calculate a single equivalency factor.

(C) The manufacturer must submit an analysis which evaluates whether the durability objective will be achieved for the vehicle designs which will be certified using the customized/alternative cycle. The analysis must address of the following elements:

(1) How the durability objective has been achieved using the data submitted in paragraph (e)(1)(iii)(A) of this section.

(2) How the durability objective will be achieved for the vehicle designs which will be covered by the customized/alternative cycle. This analysis should consider the emissions deterioration impact of the design differences between the vehicles included in the data set required in (e)(1)(iii)(A) of this section and the vehicle designs that the manufacturer intends to certify using the customized/alternative cycle.

(2) *Bench-aging durability procedures.* A manufacturer may use a customized or alternative bench aging durability procedure for a required durability demonstration, if approved as described in paragraphs (e)(2)(i) through (vii) of this section. A customized/alternative bench aging procedure must use vehicle performance data (such as catalyst temperature) measured on an approved road cycle as part of the algorithm to calculate bench aging time. The manufacturer must obtain approval from the Agency prior to using a customized bench durability procedure.

(i) The lower control temperature on the SBC may be modified without prior EPA approval provided that the high control temperature is set 90 °C above

the lower control temperature and an approved BAT equation is used to calculate bench aging time.

(ii) The R-factor used in EPA's BAT equation may be determined experimentally using EPA's standard procedures (specified in appendix IX of this part) without prior EPA approval. Other experimental techniques to calculate the R-factor require advance EPA approval. To obtain approval, the manufacturer must demonstrate that the calculated bench aging time results in the same (or larger) amount of emission deterioration as the associated road cycle.

(iii) The A-factor used in EPA's BAT equation may be modified, using good engineering judgement without prior EPA approval, to ensure that the modified durability process will achieve the durability objective of paragraph (a) of this section.

(iv) Bench aging may be conducted using fuel with additional compounds that may lead to catalyst poisoning, such as phosphorus, sulfur or lead, without prior EPA approval. A manufacturer using fuel with these additional compounds may either calculate a new R-factor or A-factor to assure that the durability objective of paragraph (a) of this section is properly achieved regardless of the use of worst-case fuel, in which case the approval criteria for those changes would apply.

(v) An approved customized/alternative road cycle may be used to develop catalyst temperature histograms for use in the BAT equation without additional EPA approval beyond the original approval necessary to use that cycle for mileage accumulation.

(vi) A different bench cycle than the SBC may be used during bench aging with prior EPA approval. To obtain approval the manufacturer must demonstrate that bench aging for the appropriate time on the new bench cycle provides the same or larger amount of emission deterioration as the associated road cycle.

(vii) A different method to calculate bench aging time may be used with prior EPA approval. To obtain approval the manufacturer must demonstrate that bench aging for the time calculated by the alternative method results in the same or larger amount of

emission deterioration as the associated road cycle.

(f) *Use of deterioration program to determine compliance with the standard.* A manufacturer may select from two methods for using the results of the deterioration program to determine compliance with the applicable emission standards. Either a deterioration factor (DF) is calculated and applied to the emission data vehicle (EDV) emission results or aged components are installed on the EDV prior to emission testing.

(1) *Deterioration factors.* (i) Deterioration factors are calculated using all FTP emission test data generated during the durability testing program except as noted:

(A) Multiple tests at a given mileage point are averaged together unless the same number of tests are conducted at each mileage point.

(B) Before and after maintenance test results are averaged together.

(C) Zero-mile test results are excluded from the calculation.

(D) Total hydrocarbon (THC) test points beyond the 50,000-mile (useful life) test point are excluded from the intermediate useful life deterioration factor calculation.

(E) A procedure may be employed to identify and remove from the DF calculation those test results determined to be statistical outliers providing that the outlier procedure is consistently applied to all vehicles and data points and is approved in advance by the Administrator.

(ii) The deterioration factor must be based on a linear regression, or another regression technique approved in advance by the Administrator. The deterioration must be a multiplicative or additive factor. Separate factors will be calculated for each regulated emission constituent and for the full and intermediate useful life periods as applicable. Separate DF's are calculated for each durability group except as provided in § 86.1839.

(A) A multiplicative DF will be calculated by taking the ratio of the full or intermediate useful life mileage level, as appropriate (rounded to four decimal places), divided by the stabilized mileage (reference § 86.1831-01(c), e.g., 4000-mile) level (rounded to

four decimal places) from the regression analysis. The result must be rounded to three-decimal places of accuracy. The rounding required in this paragraph must be conducted in accordance with § 86.1837. Calculated DF values of less than one must be changed to one for the purposes of this paragraph.

(B) An additive DF will be calculated to be the difference between the full or intermediate useful life mileage level (as appropriate) minus the stabilized mileage (reference § 86.1831-01(c), e.g., 4000-mile) level from the regression analysis. The full useful life regressed emission value, the stabilized mileage regressed emission value, and the DF result must be rounded to the same precision and using the same procedures as the raw emission results according to the provisions of § 86.1837-01. Calculated DF values of less than zero must be changed to zero for the purposes of this paragraph.

(iii) The DF calculated by these procedures will be used for determining full and intermediate useful life compliance with FTP exhaust emission standards, SFTP exhaust emission standards, and cold CO emission standards. At the manufacturer's option and using procedures approved by the Administrator, a separate DF may be calculated exclusively using cold CO test data to determine compliance with cold CO emission standards. Also at the manufacturer's option and using procedures approved by the Administrator, a separate DF may be calculated exclusively using US06 and/or air conditioning (SC03) test data to determine compliance with the SFTP emission standards.

(2) *Installation of aged components on emission data vehicles.* For full and intermediate useful life compliance determination, the manufacturer may elect to install aged components on an EDV prior to emission testing rather than applying a deterioration factor. Different sets of components may be aged for full and intermediate useful life periods. Components must be aged using an approved durability procedure that complies with paragraph (b) of this section. The list of components to be aged and subsequently installed on

the EDV must selected using good engineering judgement.

(g) [Reserved]

(h) *Application of the durability procedure to future durability groups.* The manufacturer may apply a durability procedure approved under paragraphs (c), (d) or (e) of this section to a durability group, including durability groups in future model years, if the durability process will achieve the objective of paragraph (a) of this section for that durability group. The manufacturer must use good engineering judgment in determining the applicability of an approved durability procedure to a durability group.

(1) *Modifications to a durability procedure.* (i) Standard durability procedures. The manufacturer may modify a standard durability procedure (allowed in paragraphs (c) or (d) of this section) by increasing or decreasing the number of miles run on the SRC to represent full or intermediate useful life emissions deterioration or by changing the A-Factor in the BAT equation for a bench aging, using good engineering judgment, to ensure that the modified procedure will achieve the objective of paragraph (a) of this section for that durability group.

(ii) *Customized/Alternative durability procedures.* The manufacturer may modify an alternative/customized durability procedure approved under the provisions of paragraph (e) of this section, using good engineering judgment, for the purposes of ensuring that the modified procedure will achieve the objective of paragraph (a) of this section for that durability group.

(2) The manufacturer must notify the Administrator of its determination to use an approved (or modified) durability procedure on particular test groups and durability groups prior to, or concurrently with, its submission of the Application for Certification for the affected test groups (notification at an annual preview meeting scheduled before the manufacturer begins certification activities for the model year is preferred).

(3) Prior to certification, the Administrator may reject the manufacturer's determination in paragraph (h) of this section to apply an approved or modi-

fied durability procedure for a durability group or test group if:

(i) It is not made using good engineering judgment,

(ii) It fails to properly consider data collected under the provisions of §§ 86.1845-04, 86.1846-01, and 86.1847-01 or other information, or

(iii) The Administrator determines that the durability procedure has not been shown to achieve the objective of paragraph (a) of this section for particular test groups which the manufacturer plans to cover with the durability procedure.

(i) *Evaluation of the certification durability procedures based on in-use emissions data.* (1) Manufacturers must use the information gathered from the IUVP, as well as other sources of in-use emissions data, to periodically review whether the durability procedure it employs achieves the objective specified in paragraph (a) of this section.

(2) *Required analysis of a manufacturer's approved durability procedures.* (i) In addition to any periodic reviews under paragraph (i)(1) of this section, a manufacturer must conduct a review of whether the durability procedure it employs achieves the durability objective specified in paragraph (a) of this section when the criteria for additional testing specified in § 86.1846 (b) are activated.

(ii) These criteria are evaluated independently for all applicable FTP emission constituents.

(iii) This analysis must be performed for each test group certified by the manufacturer.

(iv) These procedures apply to the EPA standard durability procedures discussed in paragraphs (c) and (d) of this section as well as durability procedures approved under paragraph (e) of this section, including modifications under paragraph (h) of this section.

(v) The analysis must be submitted to EPA no later than 60 days after the submission of the IUVP data report specified in § 86.1847(f).

(3) EPA may require a manufacturer to perform an analysis as described in paragraph (i)(2) of this section if EPA is concerned that the manufacturer's durability procedure may not achieve the durability objective of paragraph (a) of this section.

(j) If, based on the analysis required in paragraph (i) of this section and/or any other information, EPA determines that the durability procedure does not achieve the durability objective of paragraph (a) of this section, EPA may withdraw approval to use the durability procedure or condition approval on modifications to the durability procedure. Such withdrawal or conditional approval will apply to future applications for certification and to the portion of the manufacturer's product line (or the entire product line) that the Administrator determines to be affected. Prior to such a withdrawal the Administrator will give the manufacturer a preliminary notice at least 60 days prior to the final decision. During this period, the manufacturer may submit technical discussion, statistical analyses, additional data, or other information which is relevant to the decision. The Administrator will consider all information submitted by the deadline before reaching a final decision.

(k) If EPA withdraws approval, under the provisions of paragraph (j) of this section, for a durability procedure approved under the provisions of paragraphs (c) and/or (d) of this section, the following procedures apply:

(1) The manufacturer must select one of the following options for future applications for certification for the applicable portion of the manufacturers product-line affect by the Agency's decision:

(i) Increase future DFs calculated using the applicable durability process by the average percent-difference between certification levels and IUVP data; or

(ii) Increase the miles driven on the SRC or the aging time calculated by the BAT equation by the average percent-difference between certification levels and IUVP data, or

(iii) The manufacturer may obtain approval for a new customized durability process, as allowed in paragraph (e) of this section, that has been demonstrated to meet the durability objective.

(2) If EPA's decision to withdraw approval under the provisions of paragraph (j) of this section is based on fewer than 20 tests, the Administrator may require a smaller adjustment than

specified in paragraph (k)(1)(i) or (ii) of this section.

(l) Any manufacturer may request a hearing on the Administrator's withdrawal of approval in paragraphs (j) or (k) of this section. The request must be in writing and must include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objection. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, she/he must provide the manufacturer a hearing in accordance with § 86.1853-01 with respect to such issue.

(m) *Durability demonstration procedures for vehicles subject to the greenhouse gas exhaust emission standards specified in § 86.1818.* (1) *CO₂*. (i) Unless otherwise specified under paragraph (m)(1)(ii) of this section, manufacturers may use a multiplicative *CO₂* deterioration factor of one or an additive deterioration factor of zero to determine full useful life emissions for the FTP and HFET tests.

(ii) Based on an analysis of industry-wide data, EPA may periodically establish and/or update the deterioration factor for *CO₂* emissions, including air conditioning and other credit-related emissions. Deterioration factors established and/or updated under this paragraph (m)(1)(ii) will provide adequate lead time for manufacturers to plan for the change.

(iii) Alternatively, manufacturers may use the whole-vehicle mileage accumulation procedures in § 86.1823-08 (c) or (d)(1) to determine *CO₂* deterioration factors. In this case, each FTP test performed on the durability data vehicle selected under § 86.1822 must also be accompanied by an HFET test, and combined FTP/HFET *CO₂* results determined by averaging the city (FTP) and highway (HFET) *CO₂* values, weighted 0.55 and 0.45 respectively. The deterioration factor will be determined for this combined *CO₂* value. Calculated multiplicative deterioration factors that are less than one shall be set to equal one, and calculated additive deterioration factors that are less than zero shall be set to zero.

(iv) If, in the good engineering judgment of the manufacturer, the deterioration factors determined according to paragraphs (m)(1)(i), (m)(1)(ii), or (m)(1)(iii) of this section do not adequately account for the expected CO₂ emission deterioration over the vehicle's useful life, the manufacturer may petition EPA to request a more appropriate deterioration factor.

(2) *N₂O and CH₄*. (i) For manufacturers complying with the FTP emission standards for N₂O and CH₄ specified in § 86.1818-12(f)(1) or determined under § 86.1818-12(f)(3), FTP-based deterioration factors for N₂O and CH₄ shall be determined according to the provisions of paragraphs (a) through (l) of this section.

(ii) For manufacturers complying with the fleet averaging option for N₂O and CH₄ as allowed under § 86.1818-12(f)(2), deterioration factors based on FTP testing shall be determined and may be used to determine full useful life emissions for the FTP and HFET tests. The manufacturer may at its option determine separate deterioration factors for the FTP and HFET test cycles, in which case each FTP test performed on the durability data vehicle selected under § 86.1822 of this part must also be accompanied by an HFET test.

(iii) For the 2012 through 2016 model years only, manufacturers may use alternative deterioration factors. For N₂O, the alternative deterioration factor to be used to adjust FTP and HFET emissions is the deterioration factor determined for (or derived from, using good engineering judgment) NO_x emissions according to the provisions of this section. For CH₄, the alternative deterioration factor to be used to adjust FTP and HFET emissions is the deterioration factor determined for (or derived from, using good engineering judgment) NMOG or NMHC emissions according to the provisions of this section.

(3) *Other carbon-related exhaust emissions*. FTP-based deterioration factors shall be determined for carbon-related exhaust emissions (CREE), hydrocarbons, and CO according to the provisions of paragraphs (a) through (l) of this section. The FTP-based deterioration factor shall be used to determine

full useful life emissions for both the FTP (city) and HFET (highway) test cycles. The manufacturer may at its option determine separate deterioration factors for the FTP and HFET test cycles, in which case each FTP test performed on the durability data vehicle selected under § 86.1822 must also be accompanied by an HFET test. In lieu of determining emission-specific deterioration factors for the specific hydrocarbons of CH₃OH (methanol), HCHO (formaldehyde), C₂H₅OH (ethanol), and C₂H₄O (acetaldehyde) as may be required for some alternative fuel vehicles, manufacturers may use the additive or multiplicative deterioration factor determined for (or derived from, using good engineering judgment) NMOG or NMHC emissions according to the provisions of this section.

(4) *Air Conditioning leakage and efficiency or other emission credit requirements to comply with exhaust CO₂ standards*. Manufacturers will attest to the durability of components and systems used to meet the CO₂ standards. Manufacturers may submit engineering data to provide durability demonstration. Deterioration factors do not apply to emission-related components and systems used to generate air conditioning leakage and/or efficiency credits.

(n) *Emission component durability*. [Reserved]. For guidance see 40 CFR 86.1823-01(e).

[71 FR 2830, Jan. 17, 2006, as amended at 74 FR 61548, Nov. 25, 2009; 75 FR 25688, May 7, 2010; 76 FR 57378, Sept. 15, 2011; 77 FR 63161, Oct. 15, 2012; 79 FR 23726, Apr. 28, 2014]

§ 86.1824-01 Durability demonstration procedures for evaporative emissions.

This section applies to gasoline-, methanol-, liquefied petroleum gas-, and natural gas-fueled LDV/Ts, MDPVs, complete heavy-duty vehicles, and heavy-duty vehicles certified under the provisions of § 86.1801-01(c). The manufacturer shall determine a durability process that will predict the expected evaporative emission deterioration of candidate in-use vehicles over their full useful life. The manufacturer shall use good engineering judgment in determining this process.

(a) *Service accumulation method.* (1) The manufacturer shall develop a service accumulation method designed to effectively predict the deterioration of candidate in-use vehicles' evaporative emissions in actual use over its full useful life. The manufacturer shall use good engineering judgement in developing this method.

(2) The manufacturers may develop a service accumulation methods based upon whole-vehicle full-mileage accumulation, whole vehicle accelerated mileage accumulation (e.g., where 40,000 miles on a severe mileage accumulation cycle is equivalent to 100,000 miles of normal in-use driving), bench aging of individual components or systems, or other approaches approved by the Administrator.

(i) For whole vehicle mileage accumulation programs, all emission control components and systems (including both hardware and software) must be installed and operating for the entire mileage accumulation period.

(ii) Bench procedures shall simulate the aging of components or systems over the applicable useful life and shall simulate driving patterns and vehicle operational environments found in actual use. For this purpose, manufacturers may remove the emission-related components (and other components), in whole or in part, from the durability vehicle itself and deteriorate them independently. Vehicle testing for the purpose of determining deterioration factors may include the testing of durability vehicles that incorporate such bench-aged components.

(iii) For gasoline fueled vehicles certified to meet the evaporative emission standards set forth in § 86.1811-04(e)(1), any service accumulation method for evaporative emissions must employ gasoline fuel for the entire service accumulation period which contains ethanol in, at least, the highest concentration permissible in gasoline under federal law and that is commercially available in any state in the United States. Unless otherwise approved by the Administrator, the manufacturer must determine the appropriate ethanol concentration by selecting the highest legal concentration commercially available during the calendar year before the one in which the manu-

facturer begins its service accumulation. The manufacturer must also provide information acceptable to the Administrator to indicate that the service accumulation method is of sufficient design, duration and severity to stabilize the permeability of all non-metallic fuel and evaporative system components to the service accumulation fuel constituents.

(iv) For flexible-fueled, dual-fueled, multi-fueled, ethanol-fueled and methanol-fueled vehicles certified to meet the evaporative emission standards set forth in § 86.1811-04(e)(1), any service accumulation method must employ fuel for the entire service accumulation period which the vehicle is designed to use and which the Administrator determines will have the greatest impact upon the permeability of evaporative and fuel system components. The manufacturer must also provide information acceptable to the Administrator to indicate that the service accumulation method is of sufficient design, duration and severity to stabilize the permeability of all non-metallic fuel and evaporative system components to service accumulation fuel constituents.

(v) A manufacturer may use other methods, based upon good engineering judgment, to meet the requirements of paragraphs (a)(2) (iii) and (iv) of this section, as applicable. These methods must be approved in advance by the Administrator and meet the objectives of paragraphs (a)(2) (iii) and (iv) of this section, as applicable: to provide assurance that the permeability of all non-metallic fuel and evaporative system components will not lead to evaporative emission standard exceedance under sustained exposure to commercially available alcohol-containing fuels for the useful life of the vehicle.

(b) *Vehicle/component selection method.* The manufacturer shall determine a vehicle and component selection procedure which results in representative test vehicles and reflects good engineering judgment.

(c) The manufacturer shall calculate a deterioration factor which is applied to the evaporative emission results of the emission data vehicles. The deterioration factor shall be based on a linear regression, or an other regression

technique approved in advance by the Administrator. The DF will be calculated to be the difference between the full life mileage evaporative level minus the stabilized mileage (e.g., 4000-mile) evaporative level from the regression analysis. The DF and the full and stabilized mileage emission levels shall be rounded to two decimal places of accuracy in accordance with the Rounding-Off Method specified in ASTM E29-93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications (incorporated by reference, see § 86.1(b)(1). Calculated DF values of less than zero shall be changed to zero for the purposes of this paragraph.

(d) *Emission component durability.* The manufacturer shall use good engineering judgment to determine that all emission-related components are designed to operate properly for the full useful life of the vehicles in actual use.

(e) *In-use verification.* The durability program must meet the requirements of § 86.1845-01.

(f) Information obtained under §§ 86.1845-01, 86.1846-01, 86.1847-01 or from other sources shall be used by the manufacturer in developing new durability processes and/or updating existing durability processes using good engineering judgment.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6863, Feb. 10, 2000; 65 FR 59974, Oct. 6, 2000]

§ 86.1824-07 Durability demonstration procedures for evaporative emissions.

§ 86.1824-07 includes text that specifies requirements that differ from those specified in § 86.1824-01. Where a paragraph in § 86.1824-01 is identical and applicable to § 86.1824-07, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.1824-01.”. This section applies to gasoline-, methanol-, natural gas- and liquefied petroleum gas-fueled LDV/Ts, MDPVs, and HDVs.

(a) through (f) [Reserved]. For guidance see § 86.1824-01.

[66 FR 5192, Jan. 18, 2001]

§ 86.1824-08 Durability demonstration procedures for evaporative emissions.

This section describes durability demonstration procedures for evaporative emissions. Eligible small-volume manufacturers or small-volume test groups may optionally meet the requirements of §§ 86.1826 and 86.1838 instead of the requirements of paragraphs (a) through (j) of this section. A separate durability demonstration is required for each evaporative/refueling family.

(a) *Durability program objective.* The durability program must predict an expected in-use emission deterioration rate and emission level that effectively represents a significant majority of the distribution of emission levels and deterioration in actual use over the full useful life of candidate in-use vehicles of each vehicle design which uses the durability program. This requirement applies for all SHED-based measurements except the bleed emission test. The standard for bleed emissions applies for the full useful life, but manufacturers do not need to establish deterioration factors for bleed emissions. The requirements of this section do not apply for spitback or leak standards.

(b) *Required durability demonstration.* Manufacturers must conduct a durability demonstration which satisfies the provisions of either paragraph (c), (d), or (e) of this section.

(c) *Whole vehicle evaporative durability demonstration.* (1) Mileage accumulation must be conducted using the SRC or any road cycle approved under the provisions of § 86.1823(e)(1).

(2) Mileage accumulation must be conducted for either:

(i) The applicable full useful life mileage period specified in § 86.1805, or

(ii) At least 75 percent of the full useful life mileage. In which case, the manufacturer must calculate a df calculated according to the procedures of paragraph (f)(1)(ii) of this section, except that the DF must be based upon a line projected to the full-useful life mileage using the upper 80 percent statistical confidence limit calculated from the emission data.

(3) The manufacturer must conduct at least one evaporative emission test at each of the five different mileage

points selected using good engineering judgement. The required testing must include testing at 5,000 miles and at the highest mileage point run during mileage accumulation (e.g. the full useful life mileage). Additional testing may be conducted by the manufacturer using good engineering judgement. The manufacturer may select to run either the 2-day and/or 3-day evaporative test at each test point using good engineering judgement.

(d) *Bench aging evaporative durability procedures.* Manufacturers may use bench procedures designed, using good engineering judgement, to evaluate the emission deterioration of evaporative control systems. Manufacturers may base the bench procedure on an evaluation the following potential causes of evaporative emission deterioration:

(1) Cycling of canister loading due to diurnal and refueling events,

(2) Use of various commercially available fuels, including the Tier 2 requirement to include alcohol fuel;

(3) Vibration of components;

(4) Deterioration of hoses, etc. due to environmental conditions; and

(5) Deterioration of fuel cap due to wear.

(e) *Combined whole-vehicle and bench-aging programs.* Manufacturers may combine the results of whole vehicle aging and bench aging procedures using good engineering judgement.

(f) *Fuel requirements.* (1) For gasoline fueled vehicles certified to meet the evaporative emission standards set forth in this subpart, any mileage accumulation method for evaporative emissions must employ gasoline fuel for the entire mileage accumulation period which contains ethanol in, at least, the highest concentration permissible in gasoline under federal law and that is commercially available in any state in the United States. Unless otherwise approved by the Administrator, the manufacturer must determine the appropriate ethanol concentration by selecting the highest legal concentration commercially available during the calendar year before the one in which the manufacturer begins its mileage accumulation. The manufacturer must also provide information acceptable to the Administrator to indicate that the mileage ac-

cumulation method is of sufficient design, duration and severity to stabilize the permeability of all non-metallic fuel and evaporative system components to the mileage accumulation fuel constituents.

(2) For flexible-fueled, dual-fueled, multi-fueled, ethanol-fueled and methanol-fueled vehicles certified to meet the evaporative emission standards set forth in § 86.1811-04(e)(1), any mileage accumulation method must employ fuel for the entire mileage accumulation period which the vehicle is designed to use and which the Administrator determines will have the greatest impact upon the permeability of evaporative and fuel system components. The manufacturer must also provide information acceptable to the Administrator to indicate that the mileage accumulation method is of sufficient design, duration and severity to stabilize the permeability of all non-metallic fuel and evaporative system components to mileage accumulation fuel constituents.

(3) A manufacturer may use other methods, based upon good engineering judgment, to meet the requirements of paragraphs (f)(1) and (2) of this section, as applicable. These methods must be approved in advance by the Administrator and meet the objectives of paragraphs (f)(1) and (2) of this section, as applicable: to provide assurance that the permeability of all non-metallic fuel and evaporative system components will not lead to evaporative emission standard exceedance under sustained exposure to commercially available alcohol-containing fuels for the useful life of the vehicle.

(g) *Calculation of a deterioration factor.* The manufacturer must calculate a deterioration factor which is applied to the evaporative emission results of the emission data vehicles. The deterioration factor must be based on a linear regression, or an other regression technique approved in advance by the Administrator. The DF will be calculated to be the difference between the full life mileage evaporative level minus the stabilized mileage (e.g., 4000-mile) evaporative level from the regression analysis. The full useful life regressed emission value, the stabilized mileage regressed emission value, and the DF

result must be rounded to the same precision and using the same procedures as the raw emission results according to the provisions of § 86.1837-01. Calculated DF values of less than zero must be changed to zero for the purposes of this paragraph.

(h) [Reserved]

(i) If EPA determines based on IUVP data or other information that the durability procedure does not achieve the durability objective of paragraph (a) of this section, EPA may withdraw approval to use the durability procedure or condition approval on modifications to the durability procedure. Such withdrawal or conditional approval will apply to future applications for certification and to the portion of the manufacturer's product line (or the entire product line) that the Administrator determines to be affected. Prior to such a withdrawal the Administrator will give the manufacturer a preliminary notice at least 60 days prior to the final decision. During this period, the manufacturer may submit technical discussion, statistical analyses, additional data, or other information which is relevant to the decision. The Administrator will consider all information submitted by the deadline before reaching a final decision.

(j) Any manufacturer may request a hearing on the Administrator's withdrawal of approval in paragraph (i) of this section. The request must be in writing and must include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objection. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, she/he must provide the manufacturer a hearing in accordance with § 86.1853-01 with respect to such issue.

(k) *Emission component durability.* [Reserved]. For guidance see 40 CFR 86.1824-01(d).

[71 FR 2834, Jan. 17, 2006, as amended at 79 FR 23726, Apr. 28, 2014]

§ 86.1825-01 Durability demonstration procedures for refueling emissions.

This section applies to light-duty vehicles, light-duty trucks, and complete heavy-duty vehicles, and heavy-duty

vehicles which are certified under light-duty rules as allowed under the provisions of § 86.1801-01(c) which are subject to refueling loss emission compliance. Refer to the provisions of §§ 86.1811-01, 86.1811-04, 86.1812-01, 86.1813-01, and 86.1816-04 to determine applicability of the refueling standards to different classes of vehicles for various model years. Diesel fuel vehicles may qualify for an exemption to the requirements of this section under the provisions of § 86.1810. The manufacturer shall determine a durability process that will predict the expected refueling emission deterioration of candidate in-use vehicles over their full useful life. The manufacturer shall use good engineering judgment in determining this process.

(a) *Service accumulation method.* (1) The manufacturer shall develop a service accumulation method designed to effectively predict the deterioration of candidate in-use vehicles' refueling loss emissions in actual use over its full useful life. The manufacturer shall use good engineering judgement in developing this method.

(2) The manufacturers may develop a service accumulation methods based upon whole-vehicle full-mileage accumulation, whole vehicle accelerated mileage accumulation (e.g., where 40,000 miles on a severe mileage accumulation cycle is equivalent to 100,000 miles of normal in-use driving), bench aging of individual components or systems, or other approaches approved by the Administrator.

(i) For whole vehicle mileage accumulation programs, all emission control components and systems (including both hardware and software) must be installed and operating for the entire mileage accumulation period.

(ii) Bench procedures shall simulate the aging of components or systems over the applicable useful life and shall simulate driving patterns and vehicle operational environments found in actual use. For this purpose, manufacturers may remove the emission-related components (and other components), in whole or in part, from the durability vehicle itself and deteriorate them independently. Vehicle testing for the purpose of determining deterioration

factors may include the testing of durability vehicles that incorporate such bench-aged components.

(b) *Vehicle/component selection method.* The manufacturer shall determine a vehicle and component selection procedure which results in representative test vehicles and reflects good engineering judgment.

(c) The manufacturer shall calculate a deterioration factor which is applied to the refueling emission results of the emission data vehicles. The deterioration factor shall be based on a linear regression, or an other regression technique approved in advance by the Administrator. The DF will be calculated to be the difference between the full life mileage refueling loss emission level minus the stabilized mileage (e.g., 4000-mile) refueling loss emission level from the regression analysis. The DF and the full and stabilized mileage emission levels shall be rounded to two decimal places of accuracy in accordance with the Rounding-Off Method specified in ASTM E29–93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications (incorporated by reference, see § 86.1(b)(1). Calculated DF values of less than zero shall be changed to zero for the purposes of this paragraph.

(d) The durability process described in paragraph (a) of this section must be described in the application for certification under the provisions of § 86.1844–01.

(e) *Emission component durability.* The manufacturer shall use good engineering judgment to determine that all emission-related components are designed to operate properly for the full useful life of the vehicles in actual use.

(f) *In-use verification.* The durability program must meet the requirements of § 86.1845–01.

(g) Information obtained under §§ 86.1845–01, 86.1846–01, 86.1847–01 or from other sources shall be used by the manufacturer in developing new durability processes and/or updating existing durability processes using good engineering judgment.

§ 86.1825–08 Durability demonstration procedures for refueling emissions.

This section applies to 2008 and later model year light-duty vehicles, light-duty trucks, and heavy-duty vehicles which are certified under light-duty rules as allowed under the provisions of § 86.1801–01(c)(1) which are subject to refueling loss emission compliance. Optionally, a manufacturer may elect to use this section for earlier model year light-duty vehicles, light-duty trucks, and heavy-duty vehicles which are certified under light-duty rules as allowed under the provisions of § 86.1801–01(c)(1) which are subject to refueling loss emission compliance. Refer to the provisions of §§ 86.1811, 86.1812, 86.1813, 86.1814, and 86.1815 to determine applicability of the refueling standards to different classes of vehicles for various model years. Diesel fuel vehicles may qualify for an exemption to the requirements of this section under the provisions of § 86.1810.

(a) *Durability program objective.* The durability program must predict an expected in-use emission deterioration rate and emission level that effectively represents a significant majority of the distribution of emission levels and deterioration in actual use over the full useful life of candidate in-use vehicles of each vehicle design which uses the durability program.

(b) *Required durability demonstration.* Manufacturers must conduct a durability demonstration which satisfies the provisions of either paragraph (c), (d), or (e) of this section.

(c) *Whole vehicle refueling durability demonstration.* The following procedures must be used when conducting a whole vehicle durability demonstration:

(1) Mileage accumulation must be conducted using the SRC or a road cycle approved under the provisions of § 86.1823(e)(1).

(2) Mileage accumulation must be conducted for either:

(i) The applicable full useful life mileage period specified in § 86.1805, or

(ii) At least 75 percent of the full useful life mileage. In which case, the manufacturer must calculate a df calculated according to the procedures of paragraph (f)(1)(ii) of this section, except that the DF must be based upon a

[64 FR 23925, May 4, 1999, as amended at 65 FR 59974, Oct. 6, 2000]

line projected to the full-useful life mileage using the upper 80 percent statistical confidence limit calculated from the emission data.

(3) The manufacturer must conduct at least one refueling emission test at each of the five different mileage points selected using good engineering judgement. The required testing must include testing at 5,000 miles and at the highest mileage point run during mileage accumulation (e.g. the full useful life mileage). Additional testing may be conducted by the manufacturer using good engineering judgement.

(d) *Bench aging refueling durability procedures.* Manufacturers may use bench procedures designed, using good engineering judgement, to evaluate the emission deterioration of evaporative/refueling control systems. Manufacturers may base the bench procedure on an evaluation the following potential causes of evaporative/refueling emission deterioration:

- (1) Cycling of canister loading due to diurnal and refueling events;
- (2) Use of various commercially available fuels, including the Tier 2 requirement to include alcohol fuel;
- (3) Vibration of components;
- (4) Deterioration of hoses, etc. due to environmental conditions; and
- (5) Deterioration of fuel cap due to wear.

(e) *Combined whole-vehicle and bench-aging programs.* Manufacturers may combine the results of whole vehicle aging and bench aging procedures using good engineering judgement.

(f) [Reserved]

(g) *Calculation of a deterioration factor.* The manufacturer must calculate a deterioration factor which is applied to the evaporative emission results of the emission data vehicles. The deterioration factor must be based on a linear regression, or an other regression technique approved in advance by the Administrator. The DF will be calculated to be the difference between the full life mileage evaporative level minus the stabilized mileage (e.g., 4000-mile) evaporative level from the regression analysis. The full useful life regressed emission value, the stabilized mileage regressed emission value, and the DF result must be rounded to the same precision and using the same proce-

dures as the raw emission results according to the provisions of § 86.1837-01. Calculated DF values of less than zero must be changed to zero for the purposes of this paragraph.

(h) *Emission component durability.* [Reserved]. For guidance see 40 CFR 86.1845-01 (e).

(i) If EPA determines based on IUVP data or other information that the durability procedure does not achieve the durability objective of paragraph (a) of this section, EPA may withdraw approval to use the durability procedure or condition approval on modifications to the durability procedure. Such withdrawal or conditional approval will apply to future applications for certification and to the portion of the manufacturer's product line (or the entire product line) that the Administrator determines to be affected. Prior to such a withdrawal the Administrator will give the manufacturer a preliminary notice at least 60 days prior to the final decision. During this period, the manufacturer may submit technical discussion, statistical analyses, additional data, or other information which is relevant to the decision. The Administrator will consider all information submitted by the deadline before reaching a final decision.

(j) Any manufacturer may request a hearing on the Administrator's withdrawal of approval in paragraph (i) of this section. The request must be in writing and must include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objection. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, she/he must provide the manufacturer a hearing in accordance with § 86.1853-01 with respect to such issue.

[71 FR 2835, Jan. 17, 2006]

§ 86.1826-01 Assigned deterioration factors for small-volume manufacturers and small-volume test groups.

(a) *Applicability.* This program is an option available for small-volume manufacturers and small-volume test groups as described in § 86.1838.

(b) *Determination of deterioration factors.* No service accumulation method or vehicle/component selection method is required. Deterioration factors for all types of regulated emissions are assigned using the provisions in this paragraph (b). A separate assigned deterioration factor is required for each durability group. Manufacturers shall use good engineering judgment in applying deterioration factors. Manufacturers may use assigned deterioration factors that the Administrator determines and prescribes.

(1) The deterioration factors will be the Administrator's estimate, periodically updated and published in a guidance document, of the 70th percentile deterioration factors calculated using the industry-wide database of previously completed durability data vehicles or engines used for certification.

(2) The Administrator may use discretion to develop assigned deterioration factors using alternative methods if there is insufficient information to calculate an appropriate industry-wide deterioration factor (for example: a new engine technology coupled with a proven emission control system). These methods may include the use of assigned deterioration factors based on similar durability vehicles.

(3) Alternatively, with advance approval from the Administrator, a manufacturer may use deterioration factors developed by another manufacturer. The manufacturer seeking to use these deterioration factors must—

(i) Demonstrate that the engines from the two manufacturers share technical parameters to the degree that would support the conclusion that a common deterioration factor should apply for both vehicle configurations as defined in § 86.1803.

(ii) Provide supporting information, such as histograms of exhaust temperature data, comparisons of vehicle weight and road load horsepower, or comparisons of powertrains and emission control systems.

[79 FR 23726, Apr. 28, 2014]

§ 86.1827-01 Test group determination.

This section applies to the grouping of vehicles into test groups within a durability group. The vehicles covered by an application within a durability

group shall be divided into test groups based on the following criteria. The manufacturer shall use good engineering judgment in grouping vehicles into test groups.

(a) To be included in the same test group, vehicles must be identical in all following respects:

(1) Durability group;

(2) Engine displacement (within a total band width of 15 percent of the largest displacement or 50 CID, whichever is larger);

(3) Number of cylinders or combustion chambers;

(4) Arrangement of cylinders or combustion chambers (e.g. in-line, v-shaped);

(5) Subject to the same emission standards (except for CO₂), or FEL in the case of cold temperature NMHC standards, except that a manufacturer may request to group vehicles into the same test group as vehicles subject to more stringent standards, so long as all the vehicles within the test group are certified to the most stringent standards applicable to any vehicle within that test group. Light-duty trucks and light-duty vehicles may be included in the same test group if all vehicles in the test group are subject to the same emission standards, with the exception of the CO₂ standard and/or the total HC standard.

(b) Where vehicles are of a type which cannot be divided into test groups based on the criteria listed above (such as non-cylinder engines), the Administrator will establish test groups for those vehicles based upon the features most related to their exhaust emission characteristics.

(c) Manufacturers may further divide groups determined under paragraph (a) of this section providing the Administrator is notified in advance of any such changes in writing.

(d) Manufacturers may request the Administrator's approval to combine vehicles into a single test group which would normally not be eligible to be in a single test group. The petition should provide:

(1) Substantial evidence that all the vehicles in the larger grouping will have the similar levels of emissions;

(2) Evidence of equivalent component durability over the vehicle's useful life;

(3) Evidence that the groups will result in sufficient in-use verification program data, appropriate tracking in use, and clear liability for the Agency's recall program; and

(4) A statement that all vehicles within a test group are certified to the most stringent standards applicable to any vehicle within that test group.

(e) Unless otherwise approved by the Administrator, a manufacturer of hybrid electric vehicles must create separate test groups based on both the type of battery technology employed by the HEV and upon features most related to their exhaust emission characteristics.

(f) Unless otherwise approved by the Administrator, a manufacturer of electric vehicles must create separate test groups based on the type of battery technology, the capacity and voltage of the battery, and the type and size of the electric motor.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6864, Feb. 10, 2000; 65 FR 59974, Oct. 6, 2000; 72 FR 8566, Feb. 26, 2007; 75 FR 25689, May 7, 2010]

§ 86.1828-01 Emission data vehicle selection.

(a) *FTP and SFTP testing.* Within each test group, the vehicle configuration shall be selected which is expected to be worst-case for exhaust emission compliance on candidate in-use vehicles, considering all exhaust emission constituents, all exhaust test procedures, and the potential impact of air conditioning on test results. The selected vehicle will include an air conditioning engine code unless the worst-case vehicle configuration selected is not available with air conditioning. This vehicle configuration will be used as the EDV calibration.

(b) *Evaporative/Refueling testing.* Vehicles of each evaporative/refueling family will be divided into evaporative/refueling emission control systems.

(1) The vehicle configuration expected to exhibit the highest evaporative and/or refueling emission on candidate in-use vehicles shall be selected for each evaporative/refueling family and evaporative refueling emission system combination from among the corresponding vehicles selected for FTP and SFTP testing under paragraph (a) of this section. Separate vehi-

cles may be selected to be tested for evaporative and refueling testing.

(2) Each test group must be represented by both evaporative and refueling testing (provided that the refueling standards are applicable) before it may be certified. That required testing may have been conducted on a vehicle in another test group provided the tested vehicle is a member of the same evaporative/refueling family and evaporative/refueling emission system combination and it was selected for testing in accordance with the provisions of paragraph (b)(1) of this section.

(3) For evaporative/refueling emission testing, the vehicle(s) selected shall be equipped with the worst-case evaporative/refueling emission hardware available on that vehicle considering such items as canister size and material, fuel tank size and material, purge strategy and flow rates, refueling characteristics, and amount of vapor generation.

(c) *Cold CO testing.* For cold temperature CO exhaust emission compliance for each durability group, the vehicle expected to emit the highest CO emissions at 20 degrees F on candidate in-use vehicles shall be selected from the test vehicles selected in accordance with paragraph (a) of this section.

(d) [Reserved]

(e) The manufacturer may select, using good engineering judgement, an equivalent or worst-case configuration in lieu of testing the vehicle selected in paragraphs (a) through (d) of this section. Carryover data satisfying the provisions of § 86.1839-01 may also be used in lieu of testing the configuration selected in paragraphs (a) through (d) of this section.

(f) The manufacturer shall use good engineering judgment in making selections of vehicles under this section.

(g) *Cold temperature NMHC testing.* For cold temperature NMHC exhaust emission compliance for each durability group, the manufacturer must select the vehicle expected to emit the highest NMHC emissions at 20°F on candidate in-use vehicles from the test vehicles specified in paragraph (a) of this section. When the expected worst-case cold temperature NMHC vehicle is

also the expected worst-case cold temperature CO vehicle as selected in paragraph (c) of this section, then cold temperature testing is required only for that vehicle; otherwise, testing is required for both the worst-case cold temperature CO vehicle and the worst-case cold temperature NMHC vehicle.

[64 FR 23925, May 4, 1999, as amended at 79 FR 23726, Apr. 28, 2014]

§ 86.1829-01 Durability and emission testing requirements; waivers.

(a) *Durability demonstration.* (1) One durability demonstration is required for each durability group.

(2) The configuration of the DDV is determined according to the provisions of § 86.1822-01.

(3) The DDV shall be tested and accumulate service mileage according to the provisions of §§ 86.1831-01, 86.1823, 86.1824 and 86.1825. Small volume manufacturers and small volume test groups may optionally meet the requirements of § 86.1838-01.

(b) *Emissions demonstration*—(1) *FTP and SFTP Exhaust Testing*—(i) *Testing at low altitude.* One EDV shall be tested in each test group for exhaust emissions using the FTP and SFTP test procedures of subpart B of this part and the HFET test procedure of subpart B of part 600 of this chapter. The configuration of the EDV will be determined under the provisions of § 86.1828-01 of this subpart.

(ii) *Testing at high altitude.* For high-altitude exhaust emission compliance for each test group, the manufacturer shall follow one of the following two procedures:

(A) One EDV shall be tested in each test group for exhaust emissions using the FTP test procedures of subpart B of this part. The configuration of the EDV will be determined under the provisions of § 86.1828-01; or

(B) In lieu of testing vehicles according to the provisions of paragraph (b)(1)(ii)(A) of this section, a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation of appropriate high-altitude emission testing, all light-duty vehicles, light-duty trucks, and complete heavy-duty vehicles comply with

the emission standards at high altitude.

(iii) *Data submittal waivers.* (A) In lieu of testing a methanol-fueled diesel-cycle light truck for particulate emissions a manufacturer may provide a statement in its application for certification that such light trucks comply with the applicable standards. Such a statement shall be based on previous emission tests, development tests, or other appropriate information and good engineering judgment.

(B) In lieu of testing an Otto-cycle light-duty vehicle, light-duty truck, or heavy-duty vehicle for particulate emissions for certification, a manufacturer may provide a statement in its application for certification that such vehicles comply with the applicable standards. Such a statement must be based on previous emission tests, development tests, or other appropriate information and good engineering judgment.

(C) [Reserved]

(D) A manufacturer may petition the Administrator to waive the requirement to measure particulate emissions when conducting Selective Enforcement Audit testing of Otto-cycle vehicles.

(E) In lieu of testing a gasoline, diesel, natural gas, liquefied petroleum gas, or hydrogen fueled Tier 2 or interim non-Tier 2 vehicle for formaldehyde emissions when such vehicles are certified based upon NMHC emissions, a manufacturer may provide a statement in its application for certification that such vehicles comply with the applicable standards. Such a statement must be based on previous emission tests, development tests, or other appropriate information and good engineering judgment.

(F) In lieu of testing a petroleum-, natural gas-, liquefied petroleum gas-, or hydrogen-fueled heavy-duty vehicle for formaldehyde emissions for certification, a manufacturer may provide a statement in its application for certification that such vehicles comply with the applicable standards. Such a statement must be based on previous emission tests, development tests, or other appropriate information and good engineering judgment.

(G) For the 2012 through 2016 model years, in lieu of testing a vehicle for N₂O emissions, a manufacturer may provide a statement in its application for certification that such vehicles comply with the applicable standards. Such a statement may also be used for 2017 and 2018 model year vehicles only if the application for certification for those vehicles is based upon data carried over from a prior model year, as allowed under this subpart. No 2019 and later model year vehicles may be waived from testing for N₂O emissions. Such a statement must be based on previous emission tests, development tests, or other appropriate information and good engineering judgment. Vehicles certified to N₂O standards using a compliance statement in lieu of submitting test data are not required to collect and submit N₂O emission data under the in-use verification testing requirements of § 86.1845.

(2) *Evaporative/Refueling testing.* Vehicles of each evaporative/refueling family will be divided into evaporative/refueling emission control systems. Applicability of the refueling test requirements of this paragraph shall be determined in accordance with the applicability of the refueling loss standards under the provisions of § 86.1810.

(i) *Testing at low altitude.* One EDV in each evaporative/refueling family and evaporative/refueling emission control system combination must be tested in accordance with the evaporative/refueling test procedure requirement of subpart B of this part. The configuration of the EDV will be determined under the provisions of § 86.1828-01. The EDV must also be tested for exhaust emission compliance using the FTP and SFTP procedures of subpart B of this part. In lieu of testing natural gas or hydrogen fueled vehicles to demonstrate compliance with the evaporative and refueling emission standards specified in this subpart, a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation of appropriate testing and/or design parameters, all light-duty vehicles, light-duty trucks, and complete heavy-duty vehicles comply with applicable emission standards. This same testing exemption applies

for vehicles fueled by liquefied petroleum gas, except that refueling tests are required for systems that allow venting during the refueling operation.

(ii) *Testing at high altitude.* For high-altitude evaporative and/or refueling emission compliance for each evaporative/refueling family, the manufacturer shall follow one of the following two procedures:

(A) One EDV in each evaporative/refueling family and evaporative/refueling emission control system combination shall be tested in accordance with the evaporative/refueling test procedure requirement of subpart B of this part. The configuration of the EDV will be determined under the provisions of § 86.1824-01. The EDV must also be tested for exhaust emissions using the FTP procedures of subpart B of this part while operated at high altitude; or

(B) In lieu of testing vehicles according to the provisions of paragraph (b)(2)(ii)(A) of this section, a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation of such high-altitude emission testing as the manufacturer deems appropriate, all light-duty vehicles, light-duty trucks, and complete heavy-duty vehicles comply with the emission standards at high altitude.

(iii) Optional waiver of two-diurnal evaporative certification test for gasoline- and ethanol-fueled vehicles. In lieu of testing gasoline-fueled and ethanol-fueled vehicles for the supplemental two-diurnal test sequence according to the provisions of paragraphs (b)(2)(i) and (b)(2)(ii) of this section, a manufacturer may optionally provide a statement of compliance in its application for certification that, based on the manufacturer's good engineering judgement, all light-duty vehicles, light-duty trucks and complete heavy-duty vehicles in the applicable evaporative/refueling emission family comply with the evaporative emission standard for the supplemental two-diurnal test sequence.

(A) The option to provide a statement of compliance in lieu of 2-diurnal evaporative certification test data outlined in paragraph (b)(2)(iii) of this section is limited to vehicles with conventional evaporative emission control

systems (as determined by the Administrator). This option may be used for vehicles in evaporative/refueling families which are certified to the applicable two-diurnal, three-diurnal, running loss, and refueling emission standards. EPA may perform confirmatory 2-diurnal evaporative emission testing on certification test vehicles which are certified using this option (even though the manufacturer may not have performed a 2-diurnal evaporative test during the certification process). If data shows noncompliance, noncompliance will be addressed through § 86.1851. As well, if data shows noncompliance, EPA may not normally allow for subsequent waivers for the applicable evaporative family.

(B) Manufacturers shall supply information if requested by EPA in support of the statement of compliance outlined in paragraph (b)(2)(iii) of this section. This information shall include evaporative calibration information for the emission-data test vehicle and for other vehicles in the evaporative/refueling family, including, but not limited to, canister type, canister volume, canister working capacity, fuel tank volume, fuel tank geometry, the type of fuel delivery system (return, returnless, variable flow fuel pump, etc.), a description of the input parameters and software strategy used to control the evaporative canister purge, the nominal purge flow volume (in bed volumes) when vehicles are driven over the 2-diurnal (FTP) driving cycle, the nominal purge flow volume (in bed volumes) when vehicles are driven over the 3-diurnal (FTP + running loss) driving cycle, and other supporting information as necessary to demonstrate that the purge flow rate calibration on the 2-diurnal test sequence is adequate to comply with the evaporative emission standard for the supplemental two-diurnal test sequence.

(iv) For diesel-fueled light-duty vehicles, a manufacturer may provide a statement in the application for certification that vehicles comply with the refueling emission standard instead of submitting test data. Such a statement must be based on previous emission tests, development tests, or other appropriate information, and good engineering judgment.

(3) *Cold temperature CO and cold temperature NMHC Testing.* The manufacturer must test one EDV in each durability group for cold temperature CO and cold temperature NMHC exhaust emission compliance in accordance with the test procedures in subpart C of this part or with alternative procedures approved in advance by the Administrator. The selection of which EDV and test group within the durability group will be tested for cold temperature CO and cold temperature NMHC compliance will be determined under the provisions of § 86.1828-10(c) and (g).

(4) *Electric vehicles and fuel cell vehicles.* For electric vehicles and fuel cell vehicles, manufacturers may provide a statement in the application for certification that vehicles comply with all the requirements of this subpart instead of submitting test data. Such a statement must be based on previous emission tests, development tests, or other appropriate information, and good engineering judgment.

(5) *Idle CO testing.* To determine idle CO emission compliance for light-duty trucks and complete heavy-duty vehicles, the manufacturer shall follow one of the following two procedures:

(i) For test groups containing light-duty trucks and complete heavy-duty vehicles, each EDV shall be tested in accordance with the idle CO testing procedures of subpart B of this part; or

(ii) In lieu of testing light trucks and complete heavy-duty vehicles for idle CO emissions, a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation of such idle CO testing as the manufacturer deems appropriate, all light-duty trucks and complete heavy-duty vehicles comply with the idle CO emission standards.

(c) *Running change testing.* Running change testing shall be conducted as required under the provisions of § 86.1842-01.

(d) [Reserved]

[64 FR 23925, May 4, 1999, as amended at 65 FR 6864, Feb. 10, 2000; 65 FR 59975, Oct. 6, 2000; 66 FR 5193, Jan. 18, 2001; 66 FR 19310, Apr. 13, 2001; 70 FR 72929, Dec. 8, 2005; 71 FR 2836, Jan. 17, 2006; 72 FR 8566, Feb. 26, 2007; 75 FR 25689, May 7, 2010; 76 FR 19874, Apr. 8, 2011; 77 FR 63161, Oct. 15, 2012; 79 FR 23726, Apr. 28, 2014]

§ 86.1829-15 Durability and emission testing requirements; waivers.

This section describes general testing requirements for certifying vehicles under this subpart, and includes several provisions allowing for statements of compliance instead of testing in certain circumstances. Where a manufacturer provides a statement instead of test data under this section, it must be based on previous emission tests, development tests, or other appropriate information, and on good engineering judgment.

(a) One durability demonstration is required for each durability group. The configuration of the DDV is determined according to § 86.1822. The DDV shall be tested and accumulate service mileage according to the provisions of §§ 86.1823, 86.1824, 86.1825, and 86.1831. Small-volume manufacturers and small-volume test groups may optionally use the alternative durability provisions of § 86.1838.

(b) The manufacturer must test EDVs as follows to demonstrate compliance with emission standards:

(1) Test one EDV in each durability group using the test procedures in 40 CFR part 1066 to demonstrate compliance with cold temperature CO and NMHC exhaust emission standards.

(2) Test one EDV in each test group using the FTP and SFTP test procedures in 40 CFR part 1066 and the HFET test procedures of 40 CFR part 600, subpart B, to demonstrate compliance with other exhaust emission standards.

(3) Test one EDV in each evaporative/refueling family and evaporative/refueling emission control system combination using the test procedures in subpart B of this part to demonstrate compliance with evaporative and refueling emission standards.

(c) The manufacturer must demonstrate compliance with emission standards at low-altitude conditions as described in paragraph (b) of this sec-

tion. For standards that apply at high-altitude conditions, the manufacturer may either perform the same tests or provide a statement in the application for certification that, based on an engineering evaluation of appropriate testing to measure or simulate high-altitude emissions, all vehicles comply with applicable emission standards at high altitude.

(d) Manufacturers may omit exhaust testing for certification in certain circumstances as follows:

(1) For vehicles subject to the Tier 3 PM standards in §§ 86.1811, a manufacturer may provide a statement in the application for certification that vehicles comply with applicable PM standards instead of submitting PM test data for a certain number of vehicles. However, each manufacturer must test vehicles from a minimum number of durability data groups as follows:

(i) Manufacturers with a single durability data group subject to the Tier 3 PM standards in § 86.1811 must submit PM test data for that group.

(ii) Manufacturers with two to eight durability data groups subject to the Tier 3 PM standards in § 86.1811 must submit PM test data for at least two durability data groups each model year. EPA will work with the manufacturer to select durability data groups for testing, with the general expectation that testing will rotate to cover a manufacturer's whole product line over time. If a durability data group has been certified in an earlier model year based on submitted PM data, and that durability data group is eligible for certification using carryover test data, that carryover data may count toward meeting the requirements of this paragraph (d)(1), subject to the selection of durability data groups.

(iii) Manufacturers with nine or more durability data groups subject to the Tier 3 PM standards in § 86.1811 must submit PM test data for at least 25 percent of those durability data groups each model year. We will work with the manufacturer to select durability data groups for testing as described in paragraph (d)(1)(ii) of this section.

(2) Small-volume manufacturers may provide a statement in the application for certification that vehicles comply

with the applicable PM standard instead of submitting test data.

(3) Manufacturers may omit PM measurements for fuel economy and GHG testing conducted in addition to the testing needed to demonstrate compliance with the PM emission standards.

(4) Manufacturers may provide a statement in the application for certification that vehicles comply with the applicable formaldehyde standard instead of submitting test data.

(5) When conducting Selective Enforcement Audit testing, a manufacturer may petition the Administrator to waive the requirement to measure PM emissions and formaldehyde emissions.

(e) Manufacturers may omit evaporative or refueling testing for certification in certain circumstances as follows:

(1) For diesel-fueled vehicles, a manufacturer may provide a statement in the application for certification that vehicles comply with the refueling emission standard instead of submitting test data.

(2) For vehicles fueled by natural gas, a manufacturer may provide a statement in the application for certification that vehicles comply with evaporative emission standards instead of submitting test data. Compressed natural gas vehicles meeting the requirements for fueling connection devices in § 86.1813-17(f)(1) are deemed to comply with evaporative and refueling emission standards.

(3) For vehicles fueled by liquefied petroleum gas, a manufacturer may provide a statement in the application for certification that vehicles comply with evaporative and refueling emission standards instead of submitting test data, except that refueling tests are required for systems that allow venting during the refueling operation.

(4) Manufacturers may provide a statement in the application for certification that vehicles comply with the leak standard in § 86.1813 instead of submitting test data.

(5) For vehicles certified to the refueling emission standards in §§ 86.1811 or 86.1813, a manufacturer may provide a statement in the application for certification that vehicles comply with

the fuel dispensing spitback standard instead of submitting test data.

(6) In lieu of testing vehicles for the supplemental two-diurnal test sequence, a manufacturer may optionally provide a statement of compliance in its application for certification that, based on the manufacturer's good engineering judgment, all vehicles in the evaporative/refueling emission family comply with the evaporative emission standard for the supplemental two-diurnal test sequence.

(i) The option to provide a statement of compliance in lieu of 2-diurnal evaporative certification test data is limited to vehicles with conventional evaporative emission control systems (as determined by the Administrator). EPA may perform confirmatory 2-diurnal evaporative emission testing on test vehicles certified using this option. If data shows noncompliance, it will be addressed through § 86.1851. Also, if data shows noncompliance, EPA will generally disallow subsequent waivers for the applicable evaporative family.

(ii) Manufacturers shall supply information if requested by EPA in support of the statement of compliance described in this paragraph (e)(6). This information shall include evaporative calibration information for the emission-data vehicle and for other vehicles in the evaporative/refueling family, including, but not limited to, canister type, canister volume, canister working capacity, canister shape and internal configuration, fuel tank volume, fuel tank geometry, the type of fuel delivery system (return, returnless, variable flow fuel pump, etc.), a description of the input parameters and software strategy used to control the evaporative canister purge, the nominal purge flow volume (in bed volumes) when vehicles are driven over the 2-diurnal (FTP) driving cycle, the nominal purge flow volume (in bed volumes) when vehicles are driven over the 3-diurnal (FTP + running loss) driving cycle, and other supporting information as necessary to demonstrate that the purge flow rate calibration on the 2-diurnal test sequence is adequate to comply with the evaporative emission standard for the supplemental two-diurnal test sequence.

(7) Where a California evaporative emission standard is at least as stringent as a comparable federal evaporative emission standard for a vehicle, we may accept test data demonstrating compliance with the California standard as demonstrating compliance with the comparable standard under this subpart. We may require you to provide test data clearly demonstrating that a vehicle tested using the California-specified test procedures will meet the comparable standard under this subpart when tested using the test procedures specified in this part.

(8) Through model year 2019, we may accept test data demonstrating compliance with the California refueling emission standard as demonstrating compliance with the analogous refueling emission standard under this subpart if all the following conditions apply:

(i) You certified the vehicles in model year 2016 to California's refueling emission standards.

(ii) You are certifying the vehicles to refueling standards for the new model year based on carryover data instead of performing new testing.

(iii) You are also certifying the vehicles for evaporative emissions based on California test procedures under the provisions of paragraph (e)(6) of this section.

(9) For vehicles with fuel tanks exceeding 35 gallons nominal fuel tank capacity, and for any incomplete vehicles, a manufacturer may provide a statement in the application for certification that vehicles comply with refueling emission standards instead of submitting test data, consistent with 40 CFR 1037.103(c).

(f) For electric vehicles and fuel cell vehicles, manufacturers may provide a statement in the application for certification that vehicles comply with all the requirements of this subpart instead of submitting test data. Tailpipe emissions of regulated pollutants from vehicles powered solely by electricity are deemed to be zero.

[79 FR 23727, Apr. 28, 2014]

§ 86.1830-01 Acceptance of vehicles for emission testing.

(a) *General test vehicle requirements.* (1) All test vehicles shall be tested in the

proper configurations as specified in § 86.1822-01, § 86.1828-01, or § 86.1842-01, as applicable for the type of test conducted.

(2) Components affecting emissions which are used to build test vehicles shall either be randomly selected production parts or parts verified to be in the middle 50 percent of the tolerance range. The manufacturer will determine which components affect emissions using good engineering judgment.

(3) Test vehicles must have air conditioning installed and operational if that configuration is available with air conditioning. Optional equipment must be installed or represented on test vehicles according to the provisions of § 86.1832-01.

(4) Test vehicles must receive proper scheduled maintenance as established by the manufacturer according to the provisions of § 86.1834-01(b) or (c). Unscheduled maintenance must be approved under the provisions of § 86.1834-01(d).

(5) Vehicle mileage shall be accumulated in accordance with § 86.1831-01.

(6) The road load forces and equivalent test weight used during testing will be determined according to the provisions of § 86.129-00.

(7) Test vehicles shall have the appropriate emission testing hardware installed (e.g., exhaust pipe testing flange, fuel tank drain, access ports to evaporative canisters, and fuel tank heat blanket) and shall have tires with appropriate tire wear.

(b) *Special provisions for durability data vehicles.* (1) For DDV's, the mileage at all test points shall be within 250 miles of the scheduled mileage point as required under § 86.1823-08(c)(3). Manufacturers may exceed the 250 mile upper limit if there are logistical reasons for the deviation and the manufacturer determines that the deviation will not affect the representativeness of the durability demonstration.

(2) For DDV's aged using the standard or a customized/alternative whole-vehicle cycle, all emission-related hardware and software must be installed and operational during all mileage accumulation after the 5000-mile test point.

(3) DDV's may be reconfigured before the 5000-mile test point providing that the representativeness of the emission results will not be affected. Manufacturers shall use good engineering judgment in making such determinations.

(c) *Special provisions for emission data vehicles.* (1) All EDV's shall have at least the minimum number of miles accumulated to achieve stabilized emission results according to the provisions of § 86.1831-01(c).

(2) Within a durability group, the manufacturer may alter any emission data vehicle (or other vehicles such as current or previous model year emission data vehicles, running change vehicles, fuel economy data vehicles, and development vehicles) in lieu of building a new test vehicle providing that the modification will not impact the representativeness of the vehicle's test results. Manufacturers shall use good engineering judgment in making such determinations. Development vehicles which were used to develop the calibration selected for emission data testing may not be used as the EDV for that configuration. Vehicles from outside the durability group may be altered with advance approval of the Administrator.

(3) Components used to reconfigure EDV's under the provisions of paragraph (c)(2) of this section must be appropriately aged if necessary to achieve representative emission results. Manufacturers must determine the need for component aging and the type and amount of aging required using good engineering judgment.

(4) Bench-aged hardware may be installed on an EDV for emission testing as a method of determining certification levels (projected emission levels at full or intermediate useful life) using bench aging procedures under the provisions of § 86.1823.

[64 FR 23925, May 4, 1999, as amended at 71 FR 2836, Jan. 17, 2006]

§ 86.1831-01 Mileage accumulation requirements for test vehicles.

(a) *Durability Data Vehicles.* (1) The manufacturer must accumulate mileage on DDV's using the procedures in § 86.1823.

(2) All tests required by this subpart on durability data vehicles shall be

conducted within 250 miles of each of the nominal test point mileage. This ± 250 mile test point mileage tolerance may be modified with the advance approval of the Administrator if the basis for the written request is to prevent an interruption of durability mileage accumulation due to test scheduling conflicts for weekends, holidays, or other similar circumstances.

(b) *Emission data vehicles and running change vehicles.* (1) The standard method of mileage accumulation for emission data vehicles and running change vehicles is mileage accumulation using either the Standard Road Cycle specified in appendix V to this part or the Durability Driving Schedule specified in appendix IV to this part.

(2) The manufacturer may use an alternative mileage accumulation method providing the form and extent of the service accumulation represents normal driving patterns for that vehicle, the method is consistent with good engineering judgment, and the method is described in the application for certification.

(3) Except with the advance approval of the Administrator, all vehicles will accumulate mileage at a measured curb weight which is within 100 pounds of the estimated curb weight. If the loaded vehicle weight is within 100 pounds of being included in the next higher inertia weight class as specified in § 86.129, the manufacturer may elect to conduct the respective emission tests at higher loaded vehicle weight.

(c) The manufacturer shall determine the mileage at which the emission control system and engine combination is stabilized for emission-data testing. The manufacturer shall provide to the Administrator if requested, a record of the analysis used in making this determination. The manufacturer may elect to accumulate 2,000 miles (3,219 kilometers) or more on each test vehicle without making a determination. The manufacturer must accumulate a minimum of 1,000 miles (1,608 kilometers) on each emission data vehicle.

(d) All test vehicle mileage must be accurately determined, recorded, and reported to the Administrator upon request.

[64 FR 23925, May 4, 1999, as amended at 71 FR 2836, Jan. 17, 2006]

§ 86.1832-01 Optional equipment and air conditioning for test vehicles.

For test vehicles selected under §§ 86.1822-01 and 86.1828-01:

(a)(1) Where it is expected that more than 33 percent of a car line, within a test group, will be equipped with an item (whether that item is standard equipment or an option), the full estimated weight of that item must be included in the curb weight computation for each vehicle available with that item in that car line, within that test group.

(2) Where it is expected that 33 percent or less of the car line, within a test group, will be equipped with an item (whether that item is standard equipment or an option), no weight for that item will be added in computing the curb weight for any vehicle in that car line, within that test group, unless that item is standard equipment on the vehicle.

(3) In the case of mutually exclusive options, only the weight of the heavier option will be added in computing the curb weight.

(4) Optional equipment weighing less than three pounds per item need not be considered.

(b)(1) Where it is expected that more than 33 percent of a car line, within a test group, will be equipped with an item (whether that item is standard equipment or an option) that can reasonably be expected to influence emissions, then such items must actually be installed (unless excluded under paragraph (b)(2) of this section) on all emission data and durability data vehicles of that car line, within that test group, on which the items are intended to be offered in production. Items that can reasonably be expected to influence emissions include, but are not limited to: air conditioning, power steering, and power brakes.

(2) If the manufacturer determines by test data or engineering evaluation that the actual installation of the optional equipment required by paragraph (b)(1) of this section does not affect the emissions or fuel economy values, the optional equipment need not be installed on the test vehicle.

(3) The weight of the options must be included in the design curb weight and

must also be represented in the weight of the test vehicles.

(4) The engineering evaluation, including any test data, used to support the deletion of optional equipment from test vehicles, shall be maintained by the manufacturer and be made available to the Agency upon request by the Administrator within 15 business days.

(c) Except for air conditioning, where it is expected that 33 percent or less of a car line, within a test group, will be equipped with an item (whether that item is standard equipment or an option) that can reasonably be expected to influence emissions, that item may not be installed on any emission data vehicle or durability data vehicle of that car line within that test group, unless that item is standard equipment on that vehicle or specifically required by the Administrator.

(d) Air conditioning must be installed and operational on any emission data vehicle of any vehicle configuration that is projected to be available with air conditioning regardless of the rate of installation of air conditioning within the car line. Paragraphs (a) through (c) of this section will be used to determine whether the weight of the air conditioner will be included in the equivalent test weight calculations for emission testing.

§ 86.1833-01 Adjustable parameters.

(a) At the time that emission data vehicles are selected for the test fleet, a determination shall be made of those vehicle or engine parameters which will be subject to adjustment for certification. Selective Enforcement Audit and Production Compliance Audit testing, the adequacy of the limits, stops, seals, or other means used to inhibit adjustment, and the resulting physically adjustable ranges for each such parameter. The manufacturer shall use good engineering judgment in making such determinations and shall notify the Administrator of its determinations prior to emission data vehicle testing for the affected test groups (preferably at an annual preview meeting scheduled before the manufacturer begins certification activities for the model year).

(1) *Determining parameters subject to adjustment.* (i) The following parameters may be subject to adjustment: the idle fuel-air mixture parameter on Otto-cycle vehicles; the choke valve action parameter(s) on carbureted, Otto-cycle vehicles (or engines); or any parameter on any vehicle (Otto-cycle or diesel) which is physically capable of being adjusted, may significantly affect emissions, and was not present on the manufacturer's vehicles (or engines) in the previous model year in the same form and function.

(ii) Any other parameters on any vehicle or engine which are physically capable of being adjusted and which may significantly affect emissions may be determined to be subject to adjustment. However, the Administrator may do so only if he/she has previously notified the manufacturer that he/she might do so and has found, at the time he/she gave this notice, that the intervening period would be adequate to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period. In no event will this notification be given later than September 1 of the calendar year two years prior to the model year.

(iii) In determining the parameters subject to adjustment, the following shall be taken into consideration: the likelihood that, for each of the parameters listed in paragraphs (e)(1) (i) and (ii) of this section, settings other than the manufacturer's recommended setting will occur on in-use vehicles (or engines). In determining likelihood, such factors may be considered as information contained in the preliminary application, surveillance information from similar in-use vehicles, the difficulty and cost of gaining access to an adjustment, damage to the vehicle if an attempt is made to gain such access and the need to replace parts following such attempt, and the effect of settings other than the manufacturer's recommended setting on vehicle performance characteristics including emission characteristics.

(2)(i) A parameter may be determined to be adequately inaccessible or sealed if:

(A) In the case of an idle mixture screw, the screw is recessed within the

carburetor casting and sealed with lead, thermosetting plastic, or an inverted elliptical spacer or sheared off after adjustment at the factory, and the inaccessibility is such that the screw cannot be accessed and/or adjusted with simple tools in one-half hour or for \$20 (1978 dollars) or less;

(B) In the case of a choke bimetal spring, the plate covering the bimetal spring is riveted or welded in place, or held in place with nonreversible screws;

(C) In the case of a parameter which may be adjusted by elongating or bending adjustable members (e.g., the choke vacuum break), the elongation of the adjustable member is limited by design or, in the case of a bendable member, the member is constructed of a material which when bent would return to its original shape after the force is removed (plastic or spring steel materials);

(D) In the case of any parameter, the manufacturer demonstrates that adjusting the parameter to settings other than the manufacturer's recommended setting takes more than one-half hour or costs more than \$20 (1978 dollars).

(ii) A physical limit or stop shall be determined to be an adequate restraint on adjustability if:

(A) In the case of a threaded adjustment, the threads are terminated, pinned, or crimped so as to prevent additional travel without breakage or need for repairs which take more than one-half hour or cost more than \$20 (1978 dollars);

(B) The adjustment is ineffective at the end of the limits of travel regardless of additional forces or torques applied to the adjustment;

(C) The manufacturer demonstrates that travel or rotation limits cannot be exceeded with the use of simple and inexpensive tools (screwdriver, pliers, open-end or box wrenches, etc.) without incurring significant and costly damage to the vehicle or control system or without taking more than one-half hour or costing more than \$20 (1978 dollars).

(iii) If manufacturer service manuals or bulletins describe routine procedures for gaining access to a parameter or for removing or exceeding a physical limit, stop, seal or other means used to

inhibit adjustment, or if surveillance data indicate that gaining access, removing, or exceeding is likely, paragraphs (a)(2)(i) and (ii) of this section shall not apply for that parameter.

(iv) In determining the adequacy of a physical limit, stop, seal, or other means used to inhibit adjustment of a parameter not covered by paragraph (a)(2)(i) or (ii) of this section, the following shall be considered: the likelihood that it will be circumvented, removed, or exceeded on in-use vehicles. In determining likelihood, such factors may be considered as, but not limited to, information contained in the preliminary application; surveillance information from similar in-use vehicles; the difficulty and cost of circumventing, removing, or exceeding the limit, stop, seal, or other means; damage to the vehicle if an attempt is made to circumvent, remove, or exceed it and the need to replace parts following such attempt; and the effect of settings beyond the limit, stop, seal, or other means on vehicle performance characteristics other than emission characteristics.

(v) In the case of electronic components on circuit boards (such as on-board computers) the board is covered with an epoxy resin which inhibits the access to components on the board (commonly referred to as potting).

(3) Two physically adjustable ranges shall be determined for each parameter subject to adjustment:

(i)(A) In the case of a parameter determined to be adequately inaccessible or sealed, the following may be included within the physically adjustable range applicable to testing under this subpart: all settings within the production tolerance associated with the nominal setting for that parameter, as specified by the manufacturer in the application for certification or other information; or

(B) In the case of other parameters, all settings within physical limits or stops determined to be adequate restraints on adjustability shall be included within this range. The production tolerances on the location of these limits or stops may be included when determining the physically adjustable range.

(ii)(A) In the case of a parameter determined to be adequately inaccessible or sealed, only the actual settings to which the parameter is adjusted during production shall be included within the physically adjustable range applicable to testing under subparts G or K (Selective Enforcement Audit and Production Compliance Audit) of this part; or

(B) In the case of other parameters, all settings within physical limits or stops determined to be adequate restraints on adjustability, as they are actually located on the test vehicle, shall be included within the range.

(b) In lieu of making the determinations required in paragraph (a) of this section, the manufacturer may request a determination be made by the Administrator prior to emission testing. In that case, all the information discussed in paragraph (a) of this section shall be provided to the Administrator. The Administrator will respond within 90 days (excluding the elapsed time during which additional information requested by the Administrator is being gathered by the manufacturer) following the receipt of the request for determination.

(c) If the Administrator determines that the decisions made by the manufacturer under the provisions of paragraph (a) of this section were not made using good engineering judgment, the Administrator will overrule the manufacturers' decisions and conduct testing for Certification, Selective Enforcement Audit and/or Production Compliance Audit purposes by adjusting parameters according to his/her determination of those vehicle or engine parameters subject to adjustment, the adequacy of the limits, stops, seals, or other means used to inhibit adjustment, and the resulting physically adjustable ranges for each such parameter. Furthermore, the Administrator may reject testing performed by the manufacturer which failed to follow his/her determinations.

(d) Within 30 days following receipt of notification of the Administrator's determinations made under paragraph (b) or (c) of this section, the manufacturer may request a hearing on the Administrator's determinations. The request shall be in writing, signed by an

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authorized representative of the manufacturer, and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objections. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.1853-01 with respect to such issue.

§ 86.1834-01 Allowable maintenance.

(a) Maintenance performed on vehicles, engines, subsystems, or components used to determine exhaust, evaporative or refueling emission deterioration factors, as appropriate, is classified as either emission-related or non-emission-related and each of these can be classified as either scheduled or unscheduled. Further, some emission-related maintenance is also classified as critical emission-related maintenance.

(b) This section specifies emission-related scheduled maintenance for purposes of obtaining durability data and for inclusion in maintenance instructions furnished to purchasers of new motor vehicles and under § 86.1808-01.

(1) All emission-related scheduled maintenance for purposes of obtaining durability data must occur at the same mileage intervals (or equivalent intervals if engines, subsystems, or components are used) that will be specified in the manufacturer's maintenance instructions furnished to the ultimate purchaser of the motor vehicle or engine under § 86.1808-01. This maintenance schedule may be updated as necessary throughout the testing of the vehicle/engine, provided that no maintenance operation is deleted from the maintenance schedule after the operation has been performed on the test vehicle or engine.

(2) Any emission-related maintenance which is performed on vehicles, engines, subsystems, or components must be technologically necessary to assure in-use compliance with the emission standards. Manufacturers shall determine the technological need for maintenance using good engineering judgment. The Administrator has determined that emission-related maintenance at shorter intervals than

those outlined in paragraphs (b)(3) and (4) of this section is not technologically necessary to ensure in-use compliance. However, the Administrator may determine that maintenance even more restrictive (e.g., longer intervals) than that listed in paragraphs (b)(3) and (4) of this section is also not technologically necessary.

(3) Emission-related maintenance in addition to, or at shorter intervals than, that listed in paragraphs (b)(3)(i) through (vi) of this section will not be accepted as technologically necessary, except as provided in paragraph (b)(7) of this section.

(i)(A) The cleaning or replacement of light-duty vehicle or light-duty truck spark plugs shall occur at 30,000 miles of use and at 30,000-mile intervals thereafter.

(B) The cleaning or replacement of complete heavy-duty vehicle spark plugs shall occur at 25,000 miles (or 750 hours) of use and at 30,000-mile (or 750 hour) intervals thereafter, for vehicles certified for use with unleaded fuel only.

(ii) For light-duty vehicles and light-duty trucks, the adjustment, cleaning, repair, or replacement of the following items shall occur at 50,000 miles of use and at 50,000-mile intervals thereafter:

(A) Positive crankcase ventilation valve.

(B) Emission-related hoses and tubes.

(C) Ignition wires.

(D) Idle mixture.

(iii) For complete heavy-duty vehicles, the adjustment, cleaning, repair, or replacement of the following items shall occur at 50,000 miles (or 1,500 hours) of use and at 50,000-mile (1,500 hour) intervals thereafter:

(A) Positive crankcase ventilation valve.

(B) Emission-related hoses and tubes.

(C) Ignition wires.

(D) Idle mixture.

(E) Exhaust gas recirculation system related filters and coolers.

(iv) For light-duty trucks, light-duty vehicles, and complete heavy-duty vehicles, the adjustment, cleaning, repair, or replacement of the oxygen sensor shall occur at 80,000 miles (or 2,400 hours) of use and at 80,000-mile (or 2,400-hour) intervals thereafter.

(v) For light-duty trucks and light-duty vehicles, the adjustment, cleaning, repair, or replacement of the following items shall occur at 100,000 miles of use and at 100,000-mile intervals thereafter:

- (A) Catalytic converter.
- (B) Air injection system components.
- (C) Fuel injectors.
- (D) Electronic engine control unit and its associated sensors (except oxygen sensor) and actuators.
- (E) Evaporative and/or refueling emission canister(s).
- (F) Turbochargers.
- (G) Carburetors.
- (H) Superchargers.
- (I) Exhaust gas recirculation system including all related filters and control valves.
- (J) Mechanical fillpipe seals.

(vi) For complete heavy-duty vehicles, the adjustment, cleaning, repair, or replacement of the following items shall occur at 100,000 miles (or 3,000 hours) of use and at 100,000-mile (or 3,000 hour) intervals thereafter:

- (A) Catalytic converter.
- (B) Air injection system components.
- (C) Fuel injectors.
- (D) Electronic engine control unit and its associated sensors (except oxygen sensor) and actuators.
- (E) Evaporative and/or refueling emission canister(s).
- (F) Turbochargers.
- (G) Carburetors.
- (H) Exhaust gas recirculation system (including all related control valves and tubing) except as otherwise provided in paragraph (b)(3)(iii)(E) of this section.
- (I) Mechanical fillpipe seals.

(4) For diesel-cycle light-duty vehicles and light-duty trucks, emission-related maintenance in addition to, or at shorter intervals than the following will not be accepted as technologically necessary, except as provided in paragraph (b)(7) of this section:

(i) The adjustment, cleaning, repair, or replacement of the positive crankcase ventilation valve shall occur at 50,000 miles of use and at 50,000-mile intervals thereafter.

(ii) The adjustment, cleaning, repair, or replacement shall occur at 100,000 miles of use and at 100,000-mile intervals thereafter of the following items:

- (A) Fuel injectors.
- (B) Turbocharger.
- (C) Electronic engine control unit and its associated sensors and actuators.
- (D) Particulate trap or trap-oxidizer system (including related components).
- (E) Exhaust gas recirculation system including all related filters and control valves.
- (F) Catalytic converter.
- (G) Superchargers.

- (5) [Reserved]
- (6) *Critical emission-related components.*

(i) The following components are defined as critical emission-related components:

- (A) Catalytic converter.
- (B) Air injection system components.
- (C) Electronic engine control unit and its associated sensors (including oxygen sensor if installed) and actuators.
- (D) Exhaust gas recirculation system (including all related filters and control valves).
- (E) Positive crankcase ventilation valve.
- (F) Evaporative and refueling emission control system components (excluding canister air filter).
- (G) Particulate trap or trap-oxidizer system.
- (H) Any other add-on emissions-related component (i.e., a component whose sole or primary purpose is to reduce emissions or whose failure will significantly degrade emissions control and whose function is not integral to the design and performance of the engine.)

(ii) All critical emission-related scheduled maintenance must have a reasonable likelihood of being performed in use. The manufacturer shall be required to show the reasonable likelihood of such maintenance being performed in use, and such showing shall be made prior to the performance of the maintenance on the durability data vehicle. Critical emission-related scheduled maintenance items which satisfy one of the following conditions will be accepted as having a reasonable likelihood of the maintenance item being performed in use:

- (A) Data are presented which establish for the Administrator a connection

between emissions and vehicle performance such that as emissions increase due to lack of maintenance, vehicle performance will simultaneously deteriorate to a point unacceptable for typical driving.

(B) Survey data are submitted which adequately demonstrate to the Administrator that, at an 80 percent confidence level, 80 percent of such engines already have this critical maintenance item performed in use at the recommended interval(s).

(C) A clearly displayed visible signal system approved by the Administrator is installed to alert the vehicle driver that maintenance is due. A signal bearing the message "maintenance needed" or "check engine," or a similar message approved by the Administrator, shall be actuated at the appropriate mileage point or by component failure. This signal must be continuous while the engine is in operation and not be easily eliminated without performance of the required maintenance. Resetting the signal shall be a required step in the maintenance operation. The method for resetting the signal system shall be approved by the Administrator.

(D) A manufacturer may desire to demonstrate through a survey that a critical maintenance item is likely to be performed without a visible signal on a maintenance item for which there is no prior in-use experience without the signal. To that end, the manufacturer may in a given model year market up to 200 randomly selected vehicles per critical emission-related maintenance item without such visible signals, and monitor the performance of the critical maintenance item by the owners to show compliance with paragraph (b)(6)(ii)(B) of this section. This option is restricted to two consecutive model years and may not be repeated until any previous survey has been completed. If the critical maintenance involves more than one test group, the sample will be sales weighted to ensure that it is representative of all the groups in question.

(E) The manufacturer provides the maintenance free of charge, and clearly informs the customer that the maintenance is free in the instructions provided under § 86.1808-01.

(F) Any other method which the Administrator approves as establishing a reasonable likelihood that the critical maintenance will be performed in use.

(iii) Visible signal systems used under paragraph (b)(6)(ii)(C) of this section are considered an element of design of the emission control system. Therefore, disabling, resetting, or otherwise rendering such signals inoperative without also performing the indicated maintenance procedure is a prohibited act under section 203(a)(3) of the Clean Air Act (42 U.S.C. 7522(a)(3)).

(7) *Changes to scheduled maintenance.*
(i) For maintenance practices that existed prior to the 1980 model year, only the maintenance items listed in paragraphs (b)(3) and (4) of this section are currently considered by EPA to be emission-related. The Administrator may, however, determine additional scheduled maintenance items that existed prior to the 1980 model year to be emission-related by announcement in a FEDERAL REGISTER Notice. In no event may this notification occur later than September 1 of the calendar year two years prior to the affected model year.

(ii) In the case of any new scheduled maintenance, the manufacturer must submit a request for approval to the Administrator for any maintenance that it wishes to recommend to purchasers and perform during durability determination. New scheduled maintenance is that maintenance which did not exist prior to the 1980 model year, including that which is a direct result of the implementation of new technology not found in production prior to the 1980 model year. The manufacturer must also include its recommendations as to the category (i.e., emission-related or non-emission-related, critical or non-critical) of the subject maintenance and, for suggested emission-related maintenance, the maximum feasible maintenance interval. Such requests must include detailed evidence supporting the need for the maintenance requested, and supporting data or other substantiation for the recommended maintenance category and for the interval suggested for emission-related maintenance. Requests for new scheduled maintenance must be approved prior to the introduction of the new maintenance. The Administrator

will then designate the maintenance as emission-related or non-emission-related. For maintenance items established as emission-related, the Administrator will further designate the maintenance as critical if the component which receives the maintenance is a critical component under paragraph (b)(6) of this section. For each maintenance item designated as emission-related, the Administrator will also establish a technologically necessary maintenance interval, based on industry data and any other information available to EPA. Designations of emission-related maintenance items, along with their identification as critical or non-critical, and establishment of technologically necessary maintenance intervals, will be announced in the FEDERAL REGISTER.

(iii) Any manufacturer may request a hearing on the Administrator's determinations in this paragraph (b)(7). The request shall be in writing and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objections. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.1853-01 with respect to such issue.

(c) Non-emission-related scheduled maintenance which is reasonable and technologically necessary (e.g., oil change, oil filter change, fuel filter change, air filter change, cooling system maintenance, adjustment of idle speed, governor, engine bolt torque, valve lash, injector lash, timing, adjustment of air pump drive belt tension, lubrication of the exhaust manifold heat control valve, lubrication of carburetor choke linkage, re-torquing carburetor mounting bolts, etc.) may be performed on durability data vehicles at the least frequent intervals recommended by the manufacturer to the ultimate purchaser, (e.g., not at the intervals recommended for severe service).

(d) *Unscheduled maintenance on durability data vehicles.* (1) Unscheduled maintenance may be performed during the testing used to determine deterioration factors, except as provided in

paragraphs (d)(2) and (3) of this section, only under the following provisions defined in paragraphs (d)(1) (i) through (iii) of this section:

(i) A fuel injector or spark plug may be changed if a persistent misfire is detected.

(ii) Readjustment of an Otto-cycle vehicle cold-start enrichment system may be performed if there is a problem of stalling.

(iii) Readjustment of the engine idle speed (curb idle and fast idle) may be performed in addition to that performed as scheduled maintenance under paragraph (c) of this section if the idle speed exceeds the manufacturer's recommended idle speed by 300 rpm or more, or if there is a problem of stalling.

(2) Any other unscheduled vehicle, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement during testing to determine deterioration factors shall be performed (using good engineering judgment) only in the following circumstances:

(i) The part failure or system malfunction, or the repair of such failure or malfunction, does not render the vehicle or engine unrepresentative of vehicles or engines in use and does not require direct access to the combustion chamber, except for spark plug, fuel injection component, or removable prechamber removal or replacement.

(ii) The need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, engine stalling, overheating, fluid leakage, loss of oil pressure, excessive fuel consumption, or excessive power loss. The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or vehicle/engine malfunction (e.g., misfiring, stalling, black smoke), or an activation of an audible and/or visible signal, prior to the performance of any maintenance to which such overt indication or signal is relevant under the provisions of this section.

(iii) The OBD system of a durability data vehicle representing any test group certifying fully to the Federal OBD requirements as specified in

§ 86.1806-01(a) through (h) has specifically detected the problem and has illuminated the malfunction indicator light.

(3) Emission measurement may not be used as a means of determining the need for unscheduled maintenance under paragraph (d)(2) of this section, except under the following conditions:

(i) The Administrator may approve unscheduled maintenance on durability data vehicles based upon a significant change in emission levels that indicates a vehicle or engine malfunction. In these cases the Administrator may first approve specific diagnostic procedures to identify the source of the problem. The Administrator may further approve of specific corrections to the problem after the problem has been identified. The Administrator may only approve the corrective action after it is determined that:

(A) The malfunction was caused by nonproduction build practices or by a previously undetected design problem;

(B) The malfunction will not occur in production vehicles or engines in use; and

(C) The deterioration factor generated by the durability data vehicle or engine will remain unaffected by the malfunction or by the corrective action (e.g., the malfunction was present for only a short period of time before detection, replacement parts are functionally representative of the proper mileage or hours, etc.).

(ii) Following any unscheduled maintenance approved under paragraph (d)(3)(i) of this section, the manufacturer shall perform an after-maintenance emission test. If the Administrator determines that the after-maintenance emission levels for any pollutant indicates that the deterioration factor is no longer representative of production, the Administrator may disqualify the durability data vehicle or engine.

(4) If a part failure or system malfunction occurrence and/or repair has rendered the vehicle/engine unrepresentative of vehicles in use, the vehicle/engine shall not be used for determining deterioration factors.

(5) Repairs to vehicle components of a durability data vehicle other than the engine, emission control system, or

fuel system, shall be performed only as a result of part failure, vehicle system malfunction, or with the advance approval of the Administrator.

(e) *Maintenance on emission data vehicles and engines.* (1) Adjustment of engine idle speed on emission data vehicles may be performed once before the low-mileage/low-hour emission test point. Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on emission data vehicles shall be performed only with the advance approval of the Administrator.

(2) Repairs to vehicle components of an emission data vehicle other than the engine, emission control system, or fuel system, shall be performed only as a result of part failure, vehicle system malfunction, or with the advance approval of the Administrator.

(f) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent equipment, instruments, or tools will be available to dealerships and other service outlets and:

(1) Are used in conjunction with scheduled maintenance on such components; or

(2) Are used subsequent to the identification of a vehicle or engine malfunction, as provided in paragraph (d)(2) of this section for durability data vehicles or in paragraph (e)(1) of this section for emission data vehicles; or

(3) Unless specifically authorized by the Administrator.

(g) Complete emission tests (see §§ 86.106-96 through 86.145-82) are required, unless waived by the Administrator, before and after scheduled maintenance approved for durability data vehicles. The manufacturer may perform emission tests before unscheduled maintenance. Complete emission tests are required after unscheduled maintenance which may reasonably be expected to affect emissions. The Administrator may waive the requirement to test after unscheduled maintenance. These test data may be submitted weekly to the Administrator, but shall be air posted or delivered within 7 days after completion of the tests, along with a complete record of all pertinent maintenance, including a

preliminary engineering report of any malfunction diagnosis and the corrective action taken. A complete engineering report shall be delivered to the Administrator concurrently with the manufacturer's application for certification.

(h) When air conditioning SFTP exhaust emission tests are required, the manufacturer must document that the vehicle's air conditioning system is operating properly and in a representative condition. Required air conditioning system maintenance is performed as unscheduled maintenance and does not require the Administrator's approval.

[64 FR 23925, May 4, 1999, as amended at 65 FR 59975, Oct. 6, 2000; 70 FR 40443, July 13, 2005]

§ 86.1835-01 Confirmatory certification testing.

(a) *Testing by the Administrator.* (1) The Administrator may require that any one or more of the test vehicles be submitted to the Agency, at such place or places as the Agency may designate, for the purposes of conducting emissions tests. The Administrator may specify that such testing be conducted at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(i) The Administrator may adjust or cause to be adjusted any adjustable parameter of an emission-data vehicle which the Administrator has determined to be subject to adjustment for certification testing in accordance with § 86.1833-01(a)(1), to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.1833-01(a)(3), prior to the performance of any tests to determine whether such vehicle or engine conforms to applicable emission standards, including tests performed by the manufacturer under § 86.1829-01(b). However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator

shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the engine before it accumulated any dynamometer service, all other parameters being identically adjusted for the purpose of the comparison. The Administrator, in making or specifying such adjustments, will consider the effect of the deviation from the manufacturer's recommended setting on emissions performance characteristics as well as the likelihood that similar settings will occur on in-use light-duty vehicles, light-duty trucks, or complete heavy-duty vehicles. In determining likelihood, the Administrator will consider factors such as, but not limited to, the effect of the adjustment on vehicle performance characteristics and surveillance information from similar in-use vehicles.

(ii) For those vehicles parameters which the Administrator has not determined to be subject to adjustment during testing in accordance with § 86.1833-01(a)(1), the vehicle presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the vehicle label (see § 86.1807-01) as specified in the application for certification. If the Administrator determines that a vehicle is not within such tolerances, the vehicle will be adjusted, at the facility designated by the Administrator, prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report, the Administrator will determine if the vehicle will be used as an emission data vehicle.

(2) If the Administrator determines that the test data developed on an emission data vehicle under paragraph (a)(1) of this section would cause that vehicle to fail under the provisions of § 86.1841-01, then the following procedure shall be observed:

(i) The manufacturer may request a retest. Before the retest, those vehicle or engine parameters which the Administrator has not determined to be subject to adjustment for certification testing in accordance with § 86.1833-

01(a)(1) may be readjusted to manufacturer's specification, if these adjustments were made incorrectly prior to the first test. The Administrator may adjust or cause to be adjusted any parameter which the Administrator has determined to be subject to adjustment to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.1833-01(a)(3). Other maintenance or repairs may be performed in accordance with § 86.1834-01. All work on the vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(ii) The vehicle will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data vehicle.

(3) If sufficient durability data are not available at the time of any emission test conducted under paragraph (a)(1) of this section to enable the Administrator to determine whether an emission-data vehicle would fail, the manufacturer may request a retest in accordance with the provisions of paragraph (a)(2) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the vehicle from the test premises.

(4) Retesting for fuel economy reasons or for compliance with greenhouse gas exhaust emission standards in § 86.181-12 may be conducted under the provisions of § 600.008-08 of this chapter.

(b) *Manufacturer-conducted confirmatory testing.* (1) If the Administrator determines not to conduct a confirmatory test under the provisions of paragraph (a) of this section, manufacturers of light-duty vehicles, light-duty trucks, and/or medium-duty passenger vehicles will conduct a confirmatory test at their facility after submitting the original test data to the Administrator whenever any of the conditions listed in paragraphs (b)(1)(i) through (vi) of this section exist, and complete heavy-duty vehicles manufacturers will conduct a confirmatory test at their facility after submitting the original test data to the Administrator whenever the conditions listed in para-

graph (b)(1)(i) or (b)(1)(ii) of this section exist, as follows:

(i) The vehicle configuration has previously failed an emission standard;

(ii) The test exhibits high emission levels determined by exceeding a percentage of the standards specified by the Administrator for that model year;

(iii) The fuel economy value of the test as measured in accordance with the procedures in 40 CFR part 600 is higher than expected based on procedures approved by the Administrator;

(iv) The fuel economy value as measured in accordance with the procedures in part 600 of this title, is close to a Gas Guzzler Tax threshold value based on tolerances established by the Administrator for that model year; or

(v) The fuel economy value as measured in accordance with the procedures in part 600 of this title, is a potential fuel economy leader for a class of vehicles based on Administrator provided cut points for that model year.

(vi) The exhaust carbon-related exhaust emissions of the test as measured in accordance with the procedures in 40 CFR part 600 are lower than expected based on procedures approved by the Administrator.

(2) If the Administrator selects the vehicle for confirmatory testing based on the manufacturer's original test results, the testing shall be conducted as ordered by the Administrator. In this case, the manufacturer-conducted confirmatory testing specified under paragraph (b)(1) of this section would not be required.

(3) For light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles the manufacturer shall conduct a retest of the FTP or highway test if the difference between the fuel economy of the confirmatory test and the original manufacturer's test equals or exceeds three percent (or such lower percentage to be applied consistently to all manufacturer conducted confirmatory testing as requested by the manufacturer and approved by the Administrator).

(i) For use in the fuel economy and exhaust greenhouse gas fleet averaging program described in 40 CFR parts 86 and 600, the manufacturer may, in lieu

of conducting a retest, accept as official the lower of the original and confirmatory test fuel economy results, and by doing so will also accept as official the calculated CREE value associated with the lower fuel economy test results.

(ii) The manufacturer shall conduct a second retest of the FTP or highway test if the fuel economy difference between the second confirmatory test and the original manufacturer test equals or exceeds three percent (or such lower percentage as requested by the manufacturer and approved by the Administrator) and the fuel economy difference between the second confirmatory test and the first confirmatory test equals or exceeds three percent (or such lower percentage as requested by the manufacturer and approved by the Administrator). In lieu of conducting a second retest, the manufacturer may accept as official (for use in the fuel economy program and the exhaust greenhouse gas fleet averaging program) the lowest fuel economy of the original test, the first confirmatory test, and the second confirmatory test fuel economy results, and by doing so will also accept as official the calculated CREE value associated with the lowest fuel economy test results.

(c) *Official test determination.* (1) Whenever the Administrator or the manufacturer conducts a confirmatory test segment on a test vehicle, the results of that test segment, unless subsequently invalidated by the Administrator, shall comprise the official data for that test segment for the vehicle at the prescribed test point and the manufacturer's original test data for that test segment for that prescribed test point shall not be used in determining compliance with emission standards.

(i) If the Administrator or the manufacturer conducts more than one passing, valid, confirmatory test, the results from the first passing, valid confirmatory test shall be considered official and used in determining compliance with emission standards.

(ii) Official test results for fuel economy and exhaust CO₂ emission purposes are determined in accordance with the provisions of § 600.008-08 of this chapter.

(iii) The Administrator may stop a test after any evaporative test segment and use as official data any valid results obtained up to that point in the test, as described in subpart B of this part.

(2) Whenever the Administrator or the manufacturer does not conduct a confirmatory test on a test vehicle at a test point, the manufacturer's original test data will be accepted as the official data for that point.

(i) If the Administrator makes a determination based on testing under paragraph (a) of this section (or other appropriate correlation test data), that there is a lack of correlation between the manufacturer's test equipment or procedures and the test equipment or procedures used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer.

(ii) If the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provisions of this subpart, the Administrator may refuse to accept that data as the official data pending retesting or submission of further information.

(iii) If the manufacturer conducts more than one test on an emission data vehicle in the same configuration (excluding confirmatory tests run under paragraph (b) of this section), the data from the last test in that series of tests on that vehicle, will constitute the official data.

(d) Upon request of the manufacturer, the Administrator may issue a conditional certificate of conformity for a test group which has not completed the Administrator testing required under paragraph (a) of this section. Such a certificate will be issued based upon the condition that the confirmatory testing be completed in an expedited manner and that the results of the testing be in compliance with all standards and procedures.

(1) If, based on this testing or any other information, the Administrator later determines that the vehicles included in this test group do not meet

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the applicable standards, the Administrator will notify the manufacturer that the certificate is suspended. The certificate may be suspended in whole or in part as determined by the Administrator. Upon such a notification, the manufacturer must immediately cease the introduction of the affected vehicles into commerce. The manufacturer may request a hearing to appeal the Administrator's decision using the provisions of § 86.1853–01.

(2) Production of vehicles by a manufacturer under the terms of this paragraph (d) will be deemed to be a consent to recall all vehicles in the test group which the Administrator determines do not meet applicable standards, and to cause such nonconformity to be remedied at no expense to the owner.

[64 FR 23925, May 4, 1999, as amended at 65 FR 59976, Oct. 6, 2000; 66 FR 19310, Apr. 13, 2001; 75 FR 25689, May 7, 2010]

§ 86.1836–01 Manufacturer-supplied production vehicles for testing.

Any manufacturer obtaining certification under this subpart shall supply to the Administrator, upon request, a reasonable number of production vehicles selected by the Administrator which are representative of the engines, emission control systems, fuel systems, and transmission offered and typical of production models available for sale under the certificate. These vehicles shall be supplied for testing at such time and place and for such reasonable periods as the Administrator may require.

§ 86.1837–01 Rounding of emission measurements.

(a) Unless otherwise specified, the results of all emission tests shall be rounded to the number of places to the right of the decimal point indicated by expressing the applicable emission standard of this subpart to one additional significant figure, in accordance with 40 CFR 1065.20.

(b) Fleet average NO_x value calculations, where applicable, must be rounded before comparing with the applicable fleet average standard and calculating credits generated or needed as follows: manufacturers must round to the same number of significant figures

that are contained in the quantity of vehicles in the denominator of the equation used to compute the fleet average NO_x emissions, but to no less than one more decimal place than that of the applicable fleet average standard.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6864, Feb. 10, 2000; 79 FR 23728, Apr. 28, 2014]

§ 86.1838–01 Small-volume manufacturer certification procedures.

(a) *Overview.* The small-volume manufacturer certification procedures described in paragraphs (b) and (c) of this section are optional. Small-volume manufacturers may use these optional procedures to demonstrate compliance with the general standards and specific emission requirements contained in this subpart.

(b) *Eligibility requirements*—(1) *Small-volume manufacturers.* (i) Optional small-volume manufacturer certification procedures apply for vehicles produced by manufacturers with the following number of combined sales of vehicles subject to standards under this subpart in all states and territories of the United States in the model year for which certification is sought, including all vehicles and engines imported under the provisions of 40 CFR 85.1505 and 85.1509:

(A) 5,000 units for the Tier 3 standards described in §§ 86.1811, 86.1813, and 86.1816. This volume threshold applies for phasing in the Tier 3 standards and for determining the corresponding deterioration factors. This is based on average nationwide sales volumes for model years 2012 through 2014 for manufacturers that sell vehicles in model year 2012. The provision allowing delayed compliance with the Tier 3 standards applies for qualifying companies even if sales after model year 2014 increase beyond 5,000 units. Manufacturers with no sales in model year 2012 may instead rely on projected sales volumes; however, if nationwide sales exceed an average value of 5,000 units in any three consecutive model years, the manufacturer is no longer eligible for provisions that apply to small-volume manufacturers after two additional model years. For example, if actual sales in model years 2015 through

2017 exceed 5,000 units, the small-volume provisions would no longer apply starting in model year 2020.

(B) 15,000 units for all other requirements. See § 86.1845 for separate provisions that apply for in-use testing.

(ii) If a manufacturer's aggregated sales in the United States, as determined in paragraph (b)(3) of this section are fewer than the number of units specified in paragraph (b)(1)(i) of this section, the manufacturer (or each manufacturer in the case of manufacturers in an aggregated relationship) may certify under the provisions of paragraph (c) of this section.

(iii) A manufacturer that qualifies as a small business under the Small Business Administration regulations in 13 CFR Part 121 is eligible for all the provisions that apply for small-volume manufacturers under this subpart. See § 86.1801-12(j) to determine whether companies qualify as small businesses.

(iv) The sales volumes specified in this section are based on actual sales, unless otherwise specified.

(v) Except for delayed implementation of new emission standards, an eligible manufacturer must transition out of the special provisions that apply for small-volume manufacturers as described in § 86.1801-12(k)(2)(i) through (iii) if sales volumes increase above the applicable threshold.

(2) *Small-volume test groups.* (i) If the aggregated sales in all states and territories of the United States, as determined in paragraph (b)(3) of this section are equal to or greater than 15,000 units, then the manufacturer (or each manufacturer in the case of manufacturers in an aggregated relationship) will be allowed to certify a number of units under the small-volume test group certification procedures in accordance with the criteria identified in paragraphs (b)(2)(ii) through (iv) of this section.

(ii) If there are no additional manufacturers in an aggregated relationship meeting the provisions of paragraph (b)(3) of this section, then the manufacturer may certify whole test groups whose total aggregated sales (including heavy-duty engines) are less than 15,000 units using the small-volume provisions of paragraph (c) of this section.

(iii) If there is an aggregated relationship with another manufacturer which satisfies the provisions of paragraph (b)(3) of this section, then the following provisions shall apply:

(A) If none of the manufacturers own 50 percent or more of another manufacturer in the aggregated relationship, then each manufacturer may certify whole test groups whose total aggregated sales (including heavy-duty engines) are less than 15,000 units using the small-volume provisions of paragraph (c) of this section.

(B) If any of the manufacturers own 50 percent or more of another manufacturer in the aggregated relationship, then the limit of 14,999 units must be shared among the manufacturers in such a relationship. In total for all the manufacturers involved in such a relationship, aggregated sales (including heavy-duty engines) of up to 14,999 units may be certified using the small-volume provisions of paragraph (c) of this section. Only whole test groups shall be eligible for small-volume status under paragraph (c) of this section.

(iv) In the case of a joint venture arrangement (50/50 ownership) between two manufacturers, each manufacturer retains its eligibility for 14,999 units under the small-volume test group certification procedures, but the joint venture must draw its maximum 14,999 units from the units allocated to its parent manufacturers. Only whole test groups shall be eligible for small-volume status under paragraph (c) of this section.

(3) *Sales aggregation for related manufacturers.* The projected or actual sales from different firms shall be aggregated in the following situations:

(i) Vehicles and/or engines produced by two or more firms, one of which is 10 percent or greater part owned by another;

(ii) Vehicles and/or engines produced by any two or more firms if a third party has equity ownership of 10 percent or more in each of the firms;

(iii) Vehicles and/or engines produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies;

(iv) Vehicles and/or engines imported or distributed by all firms where the

vehicles and/or engines are manufactured by the same entity and the importer or distributor is an authorized agent of the entity.

(c) *Small-volume provisions.* Small-volume manufacturers and small-volume test groups shall demonstrate compliance with all applicable sections of this subpart, with the following exceptions:

(1) *Durability demonstration.* Use the provisions of § 86.1826 rather than the requirements of §§ 86.1823, 86.1824, and 86.1825.

(2) *In-use verification testing.* Measure emissions from in-use vehicles as described in § 86.1845, subject to the following additional provisions:

(i) In-use verification test vehicles may be procured from customers or may be owned by, or under the control of the manufacturer, provided that the vehicle has accumulated mileage in typical operation on public streets and has received typical maintenance.

(ii) In lieu of procuring in-use verification test vehicles that have a minimum odometer reading of 50,000 miles, a manufacturer may demonstrate to the satisfaction of the Agency that, based on owner survey data, the average mileage accumulated after 4 years for a given test group is less than 50,000 miles. The Agency may approve procurement of in-use verification test vehicles that have a lower minimum odometer reading based on such data.

(iii) The provisions of § 86.1845-04(c)(2) that require one vehicle of each test group during high mileage in-use verification testing to have a minimum odometer mileage do not apply.

(iv) Manufacturers intending to use the provisions of this paragraph (c) shall submit to the Agency a plan detailing how these provisions will be met before submitting an application for certification for the subject vehicles.

(d) *Operationally independent manufacturers.* Manufacturers may submit an application to EPA requesting treatment as an operationally independent manufacturer. A manufacturer that is granted operationally independent status may qualify for all the regulatory provisions of this subpart that apply for small-volume manufacturers on the basis of its own vehicle

production and/or sales volumes, and would not require aggregation with related manufacturers. In this paragraph (d), the term “related manufacturer(s)” means manufacturers that would qualify for aggregation under the requirements of paragraph (b)(3) of this section.

(1) To request consideration for operationally independent status, the manufacturer must submit an application demonstrating that the following criteria are met, and have been continuously met for at least two years prior to submitting the application to EPA. The application must be signed by the president or the chief executive officer of the manufacturer.

(i) The applicant does not receive any financial or other means of support of economic value from any related manufacturers for purposes of vehicle design, vehicle parts procurement, research and development, and production facilities and operation. Any transactions with related manufacturers must be conducted under normal commercial arrangements like those conducted with other external parties. Any such transactions with related manufacturers shall be demonstrated to have been at competitive pricing rates to the applicant.

(ii) The applicant maintains wholly separate and independent research and development, testing, and vehicle manufacturing and production facilities.

(iii) The applicant does not use any vehicle engines, powertrains, or platforms developed or produced by related manufacturers.

(iv) The applicant does not hold any patents jointly with related manufacturers.

(v) The applicant maintains separate business administration, legal, purchasing, sales, and marketing departments as well as wholly autonomous decision making on all commercial matters.

(vi) The Board of Directors of the applicant may not share more than 25 percent of its membership with any related manufacturer. No top operational management of the applicant may be shared with any related manufacturer, including the president, the chief executive officer (CEO), the chief financial officer (CFO), and the chief operating

officer (COO). No individual director or combination of directors that is shared with a related manufacturer may exercise exclusive management control over either or both companies.

(vii) Parts or components supply agreements between the applicant and related companies must be established through open market processes. An applicant that sells or otherwise provides parts and/or vehicle components to a manufacturer that is not a related manufacturer must do so through the open market at competitive pricing rates.

(2) Manufacturers that have been granted operationally independent status must report any material changes to the information provided in the application within 60 days of the occurrence of the change. If such a change occurs that results in the manufacturer no longer meeting the requirements of the application, the manufacturer will lose the eligibility to be considered operationally independent. The EPA will confirm that the manufacturer no longer meets one or more of the criteria and thus is no longer considered operationally independent, and will notify the manufacturer of the change in status. A manufacturer who loses the eligibility for operationally independent status must transition to the appropriate emission standards no later than the third model year after the model year in which the loss of eligibility occurred. For example, a manufacturer that loses eligibility in their 2018 model year would be required to meet appropriate standards in the 2021 model year. A manufacturer that loses eligibility must meet the applicable criteria for three consecutive model years before they are allowed to apply for a reinstatement of their operationally independent status.

(3) The manufacturer applying for operational independence shall engage an independent certified public accountant, or firm of such accountants (hereinafter referred to as "CPA"), to perform an agreed-upon procedures attestation engagement of the underlying documentation that forms the basis of the application as required in this paragraph (d).

(i) The CPA shall perform the attestation engagements in accordance with

the Statements on Standards for Attestation Engagements established by the American Institute of Certified Public Accountants.

(ii) The CPA may complete the requirements of this paragraph with the assistance of internal auditors who are employees or agents of the applicant, so long as such assistance is in accordance with the Statements on Standards for Attestation Engagements established by the American Institute of Certified Public Accountants.

(iii) Notwithstanding the requirements of paragraph (d)(2)(ii) of this section, an applicant may satisfy the requirements of this paragraph (d)(2) if the requirements of this paragraph (d)(2) are completed by an auditor who is an employee of the applicant, provided that such employee:

(A) Is an internal auditor certified by the Institute of Internal Auditors, Inc. (hereinafter referred to as "CIA"); and

(B) Completes the internal audits in accordance with the standards for internal auditing established by the Institute of Internal Auditors.

(iv) Use of a CPA or CIA who is debarred, suspended, or proposed for debarment pursuant to the Governmentwide Debarment and Suspension Regulations, 2 CFR part 1532, or the Debarment, Suspension, and Ineligibility Provisions of the Federal Acquisition Regulations, 48 CFR part 9, subpart 9.4, shall be deemed in noncompliance with the requirements of this section.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6864, Feb. 10, 2000; 67 FR 72826, Dec. 6, 2002; 71 FR 2836, Jan. 17, 2006; 77 FR 63162, Oct. 15, 2012; 79 FR 23728, Apr. 28, 2014]

§ 86.1839-01 Carryover of certification data.

(a) In lieu of testing an emission-data or durability vehicle selected under § 86.1822-01, § 86.1828-01, or § 86.1829-01, and submitting data therefrom, a manufacturer may submit exhaust emission data, evaporative emission data and/or refueling emission data, as applicable, on a similar vehicle for which certification has been obtained or for which all applicable data required under § 86.1845-01 has previously been submitted. To be eligible for this provision, the manufacturer must use good

engineering judgment and meet the following criteria:

(1) In the case of durability data, the manufacturer must determine that the previously generated durability data represent a worst case or equivalent rate of deterioration for all applicable emission constituents compared to the configuration selected for durability demonstration.

(i) Prior to certification, the Administrator may require the manufacturer to provide data showing that the distribution of catalyst temperatures of the selected durability configuration is effectively equivalent or lower than the distribution of catalyst temperatures of the vehicle configuration which is the source of the previously generated data.

(ii) For the 2001, 2002, and 2003 model years only, paragraph (a)(1) of this section does not apply to the use of exhaust emission deterioration factors meeting the requirements of § 86.1823-01(c)(2).

(2) In the case of emission data, the manufacturer must determine that the previously generated emissions data represent a worst case or equivalent level of emissions for all applicable emission constituents compared to the configuration selected for emission compliance demonstration.

(b) In lieu of using newly aged hardware on an EDV as allowed under the provisions of § 86.1823-08(f)(2), a manufacturer may use similar hardware aged for an EDV previously submitted, provided that the manufacturer determines that the previously aged hardware represents a worst case or equivalent rate of deterioration for all applicable emission constituents for durability demonstration.

[64 FR 23925, May 4, 1999, as amended at 71 FR 2836, Jan. 17, 2006]

§ 86.1840-01 Special test procedures.

(a) The Administrator may, on the basis of written application by a manufacturer, prescribe test procedures, other than those set forth in this part, for any light-duty vehicle, light-duty truck, or complete heavy-duty vehicle which the Administrator determines is not susceptible to satisfactory testing by the procedures set forth in this part.

(b) If the manufacturer does not submit a written application for use of special test procedures but the Administrator determines that a light-duty vehicle, light-duty truck, or complete heavy-duty vehicle is not susceptible to satisfactory testing by the procedures set forth in this part, the Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection in accordance with the provisions of § 86.1848(a)(2).

(c) Manufacturers of vehicles equipped with periodically regenerating aftertreatment devices must propose a procedure for testing and certifying such vehicles, including SFTP testing, for the review and approval of the Administrator. The manufacturer must submit its proposal before it begins any service accumulation or emission testing. The manufacturer must provide with its submittal sufficient documentation and data for the Administrator to fully evaluate the operation of the aftertreatment devices and the proposed certification and testing procedure.

(d) The provisions of paragraph (a) and (b) of this section also apply to MDPVs.

[65 FR 59976, Oct. 6, 2000, as amended at 71 FR 51488, Aug. 30, 2006; 77 FR 34146, June 8, 2012]

§ 86.1841-01 Compliance with emission standards for the purpose of certification.

(a) Certification levels of a test vehicle will be calculated for each emission constituent applicable to the test group for both full and intermediate useful life as appropriate.

(1) If the durability demonstration procedure used by the manufacturer under the provisions of § 86.1823, § 86.1824, or § 86.1825 requires a DF to be calculated, the DF shall be applied to the official test results determined in § 86.1835-01(c) for each regulated emission constituent and for full and intermediate useful life, as appropriate, using the following procedures:

(i) For additive DF's, the DF will be added to the emission result. The sum will be rounded to the same level of precision as the standard for the constituent at full and/or intermediate useful life, as appropriate. This rounded sum is the certification level for

that emission constituent and for that useful life mileage.

(ii) For multiplicative DFs, the DF will be multiplied by the emission result for each regulated constituent. The product will be rounded to the same level of precision as the standard for the constituent at full and intermediate useful life, as appropriate. This rounded product is the certification level for that emission constituent and for that useful life mileage.

(iii) For the SFTP composite standard of NMHC+NO_x, the measured results of NMHC and NO_x must each be adjusted by their corresponding deterioration factors before the composite NMHC+NO_x certification level is calculated. Where the applicable FTP exhaust hydrocarbon emission standard is an NMOG standard, the applicable NMOG deterioration factor must be used in place of the NMHC deterioration factor, unless otherwise approved by the Administrator.

(2) If the durability demonstration procedure used by the manufacturer under the provisions of § 86.1823, § 86.1824, or § 86.1825, as applicable, requires testing of the EDV with aged emission components, the official results of that testing determined under the provisions of § 86.1835-01(c) shall be rounded to the same level of precision as the standard for each regulated constituent at full and intermediate useful life, as appropriate. This rounded emission value is the certification level for that emission constituent at that useful life mileage.

(3) Compliance with full useful life CO₂ exhaust emission standards shall be demonstrated at certification by the certification levels on the FTP and HFET tests for carbon-related exhaust emissions determined according to § 600.113 of this chapter.

(4) The rounding required in paragraph (a) of this section shall be conducted in accordance with the provisions of § 86.1837-01.

(b) To be considered in compliance with the standards for the purposes of certification, the certification levels for the test vehicle calculated in paragraph (a) of this section shall be less than or equal to the standards for all emission constituents to which the test

group is subject, at both full and intermediate useful life as appropriate for that test group.

(c) Every test vehicle of a test group must comply with all applicable exhaust emission standards before that test group may be certified.

(d) Every test vehicle of an evaporative/refueling family must comply with all applicable evaporative and/or refueling emission standards before that family may be certified.

(e) Unless otherwise approved by the Administrator, manufacturers must not use Reactivity Adjustment Factors (RAFs) in their calculation of the certification level of any pollutant for any vehicle except for LDVs and LLDTs participating in the National Low Emission Vehicle (NLEV) program described in subpart R of this part, regardless of the fuel used in the test vehicle.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6864, Feb. 10, 2000; 66 FR 19310, Apr. 13, 2001; 71 FR 2836, Jan. 17, 2006; 75 FR 25690, May 7, 2010; 76 FR 39522, July 6, 2011]

§ 86.1842-01 Addition of a vehicle after certification; and changes to a vehicle covered by certification.

(a) *Addition of a car line after certification.* (1) If a manufacturer proposes to add to its product line a new car line of the same test group as vehicles previously certified but which was not described in the application for certification when the test vehicle(s) representing other vehicles of that combination was certified, it shall notify the Administrator. This notification shall include a full description of the vehicle to be added.

(2) The manufacturer shall perform such tests on the test vehicle(s) representing the vehicle to be added which would have been required if the vehicle had been included in the original application for certification.

(3) If, after a review of the test reports and data submitted by the manufacturer, and data derived from any testing conducted under § 86.1835-01, the Administrator determines that the test vehicle(s) or test engine(s) meets all applicable standards, the appropriate certificate will be amended accordingly. If the Administrator determines that the test vehicle(s) does not meet

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applicable standards, she/he will proceed under § 86.1850-01.

(b) *Changes to the configuration of vehicles covered by a Certificate of Conformity.* (1) A manufacturer will notify the Administrator concurrently with (or in advance of) any change or addition in production vehicles which creates a new vehicle configuration within the car lines covered in a certified test group, giving a full description of the change. Such a change is referred to as a running change. Upon notification, the manufacturer may begin production of the running change if the manufacturer determines that following the change all affected vehicles will still meet the applicable emission standards.

(i) Such notification shall include a full description of the addition or change and any supporting documentation the manufacturer may desire to include to support the manufacturer's determination in accordance with § 86.1844-01.

(ii) The manufacturer's determination that the addition or change does not cause noncompliance shall be based on an engineering evaluation of the addition or change and/or testing.

(2) The Administrator may require that additional emission testing be performed to support the manufacturer's determination submitted in paragraph (b)(1) of this section. If additional testing is required the Administrator shall proceed in accordance with paragraph (a)(3) of this section. Additional test data, if requested, must be provided within 30 days of the request or the manufacturer must rescind the addition or change immediately. The Administrator may grant additional time to complete testing. If based on this additional testing or any other information, the Administrator determines that the vehicles affected by the addition or change do not meet the applicable standards the Administrator will notify the manufacturer to rescind the addition or change immediately upon receipt of the notification.

(c) Election to produce vehicles under this section will be deemed to be a consent to recall all vehicles which the Administrator determines under paragraph (a) or (b) of this section do not meet applicable standards, and to

cause such nonconformity to be remedied at no expense to the owner.

§ 86.1843-01 General information requirements.

(a) A manufacturer must submit a separate Application for Certification (Application) for each durability group in a format approved by the Administrator and in multiple copies as designated by the Administrator. Any information within the Application which is unique to a specific test group must be submitted for each test group.

(b) Any manufacturer that fails to comply with any information requirements of §§ 86.1843-01 and 86.1844-01 may be subject to the following provisions:

(1) The Application (Part 1 and Part 2) and any additional information as designated by the Administrator shall be submitted for all durability groups prior to certification for subsequent model years, until otherwise notified by the Administrator. The Application shall be updated concurrently with every running change.

(2) Provisions of § 86.1850-01 may be imposed.

(3) Civil penalties and remedial action as applicable under the Clean Air Act may be imposed.

(c) *Part 1 of the Application.* Part 1, which shall include the items listed in § 86.1844-01(d), must be submitted to the Administrator before a certificate of conformity will be issued.

(d) *Part 2 of the Application.* Part 2, which shall include the items listed in § 86.1844-01(e), must be submitted to the Administrator by January 1st of the applicable model year. If a test group is certified less than 60 days prior to January 1st of the applicable model year, Part 2 must be submitted to the Administrator within 90 days of the effective date on the applicable certificate of conformity.

(e) *Running change submissions.* Each running change notification, as required under § 86.1842-01, must include the information listed in § 86.1844-01(f) and shall be submitted to the Administrator concurrently with, or in advance of, the implementation of any change incorporated onto production vehicles.

(f) *Updates to the Application for Certification.* (1) The manufacturer must

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submit an update to the Part 1 Application by January 1st of the applicable model year to incorporate any running changes and/or corrections which occurred after certification. If a test group is certified less than 60 days prior to January 1st of the applicable model year, this update may be submitted to the Administrator within 90 days of the effective date on the applicable certificate of conformity.

(2) The manufacturer must submit a final update to Part 1 and Part 2 of the Application by January 1st of the subsequent model year to incorporate any applicable running changes or corrections which occurred between January 1st of the applicable model year and the end of the model year. A manufacturer may request the Administrator to grant an extension (of no more than 90 days) for submittal of the final update. The request must clearly indicate the circumstances necessitating the extension.

(3) The manufacturer may not use updates to its application to correct a misbuild situation with respect to vehicles already introduced into commerce.

(g) *Recordkeeping.* (1) This subpart includes various requirements to record data or other information. Unless we specify otherwise, store these records in any format and on any media and keep them readily available for eight years after you send an associated application for certification, or eight years after you generate the data if they do not support an application for certification. You must promptly send us organized, written records in English upon request. We may review them at any time.

(2) Upon written request by the Administrator, a manufacturer shall submit any information as described in § 86.1844-01 within 15 business days. A manufacturer may request the Administrator to grant an extension. The request must clearly indicate the circumstances necessitating the extension.

(h) *In-use information requirements.* All information requirements of the in-use verification and confirmatory programs of §§ 86.1845-01 and 86.1846-01

must be met by the due dates listed in § 86.1847-01.

[64 FR 23925, May 4, 1999, as amended at 79 FR 23729, Apr. 28, 2014]

§ 86.1844-01 Information requirements: Application for certification and submittal of information upon request.

(a) All the information listed in this section must be submitted to the Agency according to the requirements specified in § 86.1843; however, we may ask you to include less information than we specify, as long as you keep the specified records.

(b) Nothing in this section limits the Administrator's discretion to require the manufacturer to submit additional records not specifically required by this section.

(c) Routine emission test records shall be retained by the manufacturer for a period of one (1) year after issuance of all certificates of conformity to which they relate. All records, other than routine emission test records, required to be produced by the manufacturer under this title shall be made available upon written request by the Administrator for a period of eight years after issuance of all certificates of conformity to which they relate.

(d) *Part 1 Application.* Part 1 must contain the following items:

(1) Correspondence and communication information, such as names, mailing addresses, phone and fax numbers, and e-mail addresses of all manufacturer representatives authorized to be in contact with EPA compliance staff. The address where official documents, such as certificates of conformity, are to be mailed must be clearly identified. At least one U.S. contact must be provided.

(2) A description of the durability group in accordance with the criteria listed in § 86.1820-01, or as otherwise used to group a product line.

(3) A description of applicable evaporative/refueling families in accordance with the criteria listed in § 86.1821-01, or as otherwise used to group a product line.

(4) *Durability information.* (i) A description of the durability method used

to establish useful life durability, including exhaust and evaporative/refueling emission deterioration factors as required in §§ 86.1823, 86.1824 and 86.1825 when applicable.

(ii) The equivalency factor required to be calculated in § 1823-06(e)(iii)(B), when applicable.

(5) A description of each test group in accordance with the criteria listed in § 86.1827-01 or as otherwise used to group a product line.

(6) Identification and description of all vehicles for which testing is required by §§ 86.1822-01 and 86.1828-01 to obtain a certificate of conformity.

(7) A comprehensive list of all test results, including official certification levels, and the applicable intermediate and full useful life emission standards to which the test group is to be certified as required in § 86.1829. Include the following additional information related to testing:

(i) Include a comparison of drive cycle energy and target cycle energy relative to both inertia and road load forces as specified in 40 CFR 1066.425 for each drive cycle or test phase, as appropriate.

(ii) For gasoline-fueled Tier 3 vehicles, identify the method of accounting for ethanol in determining evaporative emissions, as described in § 86.1813.

(iii) Identify any aspects of testing for which the regulations obligate EPA testing to conform to your selection of test methods.

(8) A statement that all applicable vehicles will conform to the emission standards for which emission data is not being provided, as allowed under § 86.1806 or § 86.1829. The statement shall clearly identify the standards for which emission testing was not completed.

(9) Information describing each emission control diagnostic system required by § 86.1806, including all of the following:

(i) A description of the functional operation characteristics of the diagnostic system, with additional information demonstrating that the system meets the requirements specified in § 86.1806. Include all testing and demonstration data submitted to the California Air Resources Board for certification.

(ii) The general method of detecting malfunctions for each emission-related powertrain component.

(iii) Any deficiencies, including resolution plans and schedules.

(iv) A statement that the diagnostic system is adequate for the performance warranty test described in 40 CFR Part 85, subpart W.

(v) For vehicles certified to meet the leak standard in § 86.1813, a description of the anticipated test procedure. The description must include, at a minimum, a method for accessing the fuel system for measurements and a method for pressurizing the fuel system to perform the procedure specified in 40 CFR 1066.985. The recommended test method must include at least two separate points for accessing the fuel system, with additional access points as appropriate for multiple fuel tanks and multiple evaporative or refueling canisters.

(10) A description of all flexible or dedicated alternate fuel vehicles including, but not limited to, the fuel and/or percentage of alternate fuel for all such vehicles.

(11) A list of all auxiliary emission control devices (AECD) installed on any applicable vehicles, including a justification for each AECD, the parameters they sense and control, a detailed justification of each AECD that results in a reduction in effectiveness of the emission control system, and rationale for why it is not a defeat device as defined under § 86.1809. The following specific provisions apply for AECDs:

(i) For any AECD uniquely used at high altitudes, EPA may request engineering emission data to quantify any emission impact and validity of the AECD.

(ii) For any AECD uniquely used on multi-fuel vehicles when operated on fuels other than gasoline, EPA may request engineering emission data to quantify any emission impact and validity of the AECD.

(iii) For Tier 3 vehicles with spark-ignition engines, describe how AECDs are designed to comply with the requirements of § 86.1811-17(d). Identify which components need protection through enrichment strategies; describe the temperature limitations for those components; and describe how

the enrichment strategy corresponds to those temperature limitations. We may also require manufacturers to submit this information for certification related to Tier 2 vehicles.

(12) Identification and description of all vehicles covered by each certificate of conformity to be produced and sold within the U.S. The description must be sufficient to identify whether any given in-use vehicle is, or is not, covered by a given certificate of conformity, the test group and the evaporative/refueling family to which it belongs and the standards that are applicable to it, by matching readily observable vehicle characteristics and information given in the emission control information label (and other permanently attached labels) to indicators in the Part 1 Application. In addition, the description must be sufficient to determine for each vehicle covered by the certificate, all appropriate test parameters and any special test procedures necessary to conduct an official certification exhaust or evaporative emission test as was required by this subpart to demonstrate compliance with applicable emission standards. The description shall include, but is not limited to, information such as model name, vehicle classification (light-duty vehicle, light-duty truck, or complete heavy-duty vehicle), sales area, engine displacement, engine code, transmission type, tire size and parameters necessary to conduct exhaust emission tests such as equivalent test weight, curb and gross vehicle weight, test horsepower (with and without air conditioning adjustment), coast down time, shift schedules, cooling fan configuration, etc. and evaporative tests such as canister working capacity, canister bed volume and fuel temperature profile. The Part 1 may include ranges for test parameters in lieu of actual values.

(13) Projected U.S. vehicle sales volumes for each test group and evaporative/refueling family combination organized in such a way to determine projected compliance with any applicable implementation schedules or minimum sales requirements as specified in § 86.1810 or as otherwise required by this chapter.

(14) A request for a certificate of conformity for each test group after all re-

quired testing has been completed. The request must be signed by an authorized manufacturer representative and include a statement that the test group complies with all applicable regulations contained within this chapter.

(15)(i) For HEVs and EVs, describe the recharging procedures and methods for determining battery performance, such as state of charge and charging capacity.

(ii) For vehicles with fuel-fired heaters, include the information specified in this paragraph (d)(15)(ii). Describe the control system logic of the fuel-fired heater, including an evaluation of the conditions under which it can be operated and an evaluation of the possible operational modes and conditions under which evaporative emissions can exist. Use good engineering judgment to establish an estimated exhaust emission rate from the fuel-fired heater in grams per mile. Describe the testing used to establish the exhaust emission rate.

(16)(i) A statement indicating that the manufacturer has conducted an engineering analysis of the complete exhaust system to ensure that the exhaust system has been designed—

(A) To facilitate leak-free assembly, installation and operation for the full useful life of the vehicle; and

(B) To facilitate that such repairs as might be necessary on a properly maintained and used vehicle can be performed in such a manner as to maintain leak-free operation, using tools commonly available in a motor vehicle dealership or independent repair shop for the full useful life of the vehicle.

(ii) The analysis must cover the exhaust system and all related and attached components including the air injection system, if present, from the engine block manifold gasket surface to a point sufficiently past the last catalyst and oxygen sensor in the system to assure that leaks beyond that point will not permit air to reach the oxygen sensor or catalyst under normal operating conditions.

(iii) A “leak-free” system is one in which leakage is controlled so that it will not lead to a failure of the certification exhaust emission standards in-use.

(17) The name of an agent for service of process located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

(e) *Part 2 Application.* Part 2 must contain the following items:

(1) A list of part numbers of all emission-related components and AECDs for each emission control system, including those found on actual components. The part numbers shall be organized by engine code or other similar classification scheme.

(2) Basic calibration information, organized by engine code (or other similar classification scheme), for the major components of the fuel system, EGR system, ignition system, oxygen sensor(s) and thermostat. Examples of major components and associated calibration information include, but are not limited to; fuel pump and fuel pump flow rate, fuel pressure regulator and regulated fuel pressure, EGR valve and EGR exhaust gas flow rate at specified vacuum levels, EGR vacuum regulator and regulated vacuum, EGR orifice and orifice diameter, basic engine timing, timing RPM, idle rpm, spark plug gap, oxygen sensor output (mV), and thermostat opening temperature.

(3) Identification and description of all vehicles covered by each certificate of conformity to be produced and sold within the U.S. The description must be sufficient to identify whether any given in-use vehicle is, or is not, covered by a given certificate of conformity, the test group and the evaporative/refueling family to which it belongs and the standards that are applicable to it, by matching readily observable vehicle characteristics and information given in the emission control information label (and other permanently attached labels) to indicators in the Part 1 Application. In addition, the description must be sufficient to determine for each vehicle covered by the certificate, all appropriate test parameters and any special test procedures necessary to conduct an official certification exhaust or evaporative emission test as was required by this subpart to demonstrate compliance with applicable emission standards. The description

shall include, but is not limited to, information such as model name, vehicle classification (light-duty vehicle, light-duty truck, or complete heavy-duty vehicle), sales area, engine displacement, engine code, transmission type, tire size and parameters necessary to conduct exhaust emission tests such as equivalent test weight, curb and gross vehicle weight, test horsepower (with and without air conditioning adjustment), coast down time, shift schedules, cooling fan configuration, etc and evaporative tests such as canister working capacity, canister bed volume and fuel temperature profile. Actual values must be provided for all parameters.

(4) Final U.S. vehicle sales volumes for each test group and evaporative/refueling family combination organized in such a way to verify compliance with any applicable implementation schedules. Final sales are not required until the final update to the Part 2 Application at the end of the model year.

(i) The manufacturer may petition the Administrator to allow actual volume produced for U.S. sale to be used in lieu of actual U.S. sales. The petition must establish that production volume is functionally equivalent to sales volume.

(ii) The U.S. sales volume shall be based on the location of the point of sale to a dealer, distributor, fleet operator, broker, or any other entity which comprises the point of first sale.

(5) Copies of all service manuals, service bulletins and instructions regarding the use, repair, adjustment, maintenance, or testing of such vehicles relevant to the control of crankcase, exhaust or evaporative emissions, as applicable, issued by the manufacturer (in written or electronic form) for use by other manufacturers, assembly plants, distributors, dealers, and ultimate purchasers. These shall be submitted to the Agency when they are made available to the public and must be updated as appropriate throughout the useful life of the corresponding vehicles.

(6) The NMOG/NMHC and HCHO to NMHC ratios established according to § 86.1845-04.

(7) The results of any production vehicle evaluation testing required for OBD systems under § 86.1806.

(f) Running change submissions. A manufacturer shall submit to the Administrator a notification of all running changes as required in accordance with §§ 86.1842-01 and 86.1843-01 at the time each change is incorporated into production. Each running change notification shall include:

(1) A detailed description of the change;

(2) The reason for the change;

(3) The portion of the product line that is affected by the change, including information sufficient to identify whether any given in-use vehicle includes the change;

(4) The effect the change will have on emissions;

(5) Any test data that is determined to be necessary to demonstrate compliance with applicable emission standards; and

(6) A summary report for each test group which provides an overview of all running changes that have been incorporated since certification.

(g) The manufacturer shall provide the following information, or other information as deemed necessary by the Administrator, to the Agency upon written request by the Administrator. This includes any information, or explanations of such information specified in paragraphs (d), (e), and (f) of this section.

(1) A detailed description of the basis for all good engineering judgment decisions that were required to be made by the manufacturer. These include, but are not limited to, placement of vehicles into durability and test groups, the appropriateness of a durability process for future model years, worst-case vehicle selections for durability and emission data purposes, and carry-over or carry-across of emission test data.

(2) The basis used for all compliance statements submitted under this section. Each statement must be supported by the manufacturer using good engineering judgment and should include any emission test data, development test data, or other supporting information deemed necessary. This includes information necessary to dem-

onstrate compliance with any emission standards for which a compliance statement was submitted in lieu of actual emission test data as allowed under § 86.1810.

(3) Detailed technical descriptions of emission-related components and AECDs, including schematic diagrams and hose and wire routings which describe the fundamental operating characteristics of each emission control system.

(4) Detailed calibration specifications for all emission-related components and AECDs.

(5) Any information necessary to demonstrate that no defeat devices are present on any vehicles covered by a certificate including, but not limited to, a description of the technology employed to control CO emissions at intermediate temperatures, as applicable.

(6) The following information describing any adjustable parameters:

(i) A list of those parameters which are physically capable of being adjusted (including those adjustable parameters for which access is difficult) and that, if adjusted to settings other than the manufacturer's recommended setting, may affect emissions;

(ii) A specification of the manufacturer's intended physically adjustable range of each such parameter, and the production tolerances of the limits or stops used to establish the physically adjustable range;

(iii) A description of the limits or stops used to establish the manufacturer's intended physically adjustable range of each adjustable parameter, or any other means used to inhibit adjustment;

(iv) The nominal or recommended setting, and the associated production tolerances, for each such parameter;

(v) The specifications used during all emission testing required by this subpart.

(7) A history of each motor vehicle used for certification testing, including a general description of the buildup of the vehicle and engine. Each history shall begin when any of the selection or buildup activities occur and should include details of the use of the vehicle for development testing. Each history must include a description of the origin

and selection process for fuel system components, fuel injection components and emission control system components and specify the steps taken to assure that the certification vehicle will be representative of production vehicles.

(8) A record of all emission tests performed on all durability and emission data vehicles required to be tested by this subpart including test results, the date and purpose of each test, and the number of miles accumulated on the vehicle.

(9) A record and description of any significant events (including extraordinary events such as vehicle accidents or dynamometer runaway) affecting any certification test vehicle, including all maintenance, servicing or tests performed to diagnose engine or emission control system performance. The date and time of each event and an explanation must be included.

(10) For vehicles with non-integrated refueling emission control systems, a description of the drivedown used to purge the refueling canister and a description of the procedures used to determine the number of equivalent UDDS cycles required to purge the refueling canisters, as determined from the fuel economy on the UDDS applicable to the test vehicle of that evaporative/refueling family and emission control system combination required to use a volume of fuel equal to 85% of fuel tank volume and from subpart B of this part.

(11) A description of all procedures, including any special procedures, used to comply with applicable test requirements of this subpart. Any special procedures used to establish durability data or emission deterioration factors required to be determined under §§ 86.1823-01, 86.1824-01 and 86.1825-01 and to conduct emission tests required to be performed on applicable emission data vehicles under § 86.1829-01 according to test procedures contained within this Title must also be included.

(12) A description of any unique procedures required to perform evaporative/refueling emission tests for all vehicles in each evaporative/refueling family and a description of the method used to develop those unique procedures, including canister working ca-

capacity, canister bed volume and fuel temperature profile for the running loss test.

(13) A description of the method to be used to decode vehicle identification numbers.

(14) For complete heavy-duty vehicles only, all hardware (including scan tools) and documentation necessary for EPA to read, interpret, and store (in engineering units if applicable) any information broadcast by an engine's on-board computers and electronic control modules which relates in anyway to emission control devices and auxiliary emission control devices, provided that such hardware, passwords, or documentation exists and is not otherwise commercially available. Passwords include any information necessary to enable generic scan tools or personal computers access to proprietary emission related information broadcast by an engine's on-board computer, if such passwords exist. This requirement includes access by EPA to any proprietary code information which may be broadcast by an engine's on-board computer and electronic control modules. Information which is confidential business information must be marked as such. Engineering units refers to the ability to read, interpret, and store information in commonly understood engineering units, for example, engine speed in revolutions per minute or per second, injection timing parameters such as start of injection in degree's before top-dead center, fueling rates in cubic centimeters per stroke, vehicle speed in milers per hour or per kilometer.

(h) *In-use information requirements.* Manufacturers must submit the information required in § 86.1847-01.

(i) For exhaust emission testing for Tier 2 and interim non-Tier 2 vehicles, if approved by the Administrator in advance, manufacturers may submit exhaust emission test data generated under California test procedures to comply with any certification and in-use testing requirements under this subpart. The Administrator may require supporting information to establish that differences between California and Federal exhaust testing procedures and fuels will not produce significant

differences in emission results. The Administrator may require that in-use testing be performed using Federal test fuels as specified in § 86.113-04(a)(1).

[64 FR 23925, May 4, 1999, as amended at 65 FR 6865, Feb. 10, 2000; 65 FR 59976, Oct. 6, 2000; 71 FR 2837, Jan. 17, 2006; 71 FR 51489, Aug. 30, 2006; 72 FR 8566, Feb. 26, 2007; 75 FR 66457, Oct. 28, 2010; 76 FR 57378, Sept. 15, 2011; 78 FR 36388, June 17, 2013; 79 FR 23730, Apr. 28, 2014]

§ 86.1845-04 Manufacturer in-use verification testing requirements.

(a) *General requirements.* (1) Manufacturers of LDV, LDT, MDPV and complete HDV must test, or cause to have tested, a specified number of vehicles. Such testing must be conducted in accordance with the provisions of this section.

(2) Unless otherwise approved by the Administrator, no emission measurements made under the requirements of this section may be adjusted by Reactivity Adjustment Factors (RAFs).

(3) The following provisions apply regarding the possibility of residual effects from varying fuel sulfur levels:

(i) Vehicles certified to Tier 3 standards under § 86.1811 must always measure emissions over the FTP, then over the HFET (if applicable), then over the US06 portion of the SFTP. If a Tier 3 vehicle meets all the applicable emission standards except the FTP or HFET emission standard for NMOG+NO_x, and a fuel sample from the tested vehicle (representing the as-received condition) has a measured fuel sulfur level exceeding 15 ppm when measured as described in 40 CFR 1065.710, the manufacturer may repeat the FTP and HFET measurements and use the new emission values as the official results for that vehicle. For all other cases of testing Tier 3 vehicles, measured emission levels from the first test will be considered the official results for the test vehicle, regardless of any test results from additional test runs. Where repeat testing is allowed, the vehicle may operate for up to two US06 cycles (with or without measurement) before repeating the FTP and HFET measurements. The repeat measurements must include both FTP and HFET, even if the vehicle failed only one of those tests, unless the HFET is not required for a particular vehicle.

Tier 3 vehicles may not undergo any other vehicle preconditioning to eliminate fuel sulfur effects on the emission control system, unless we approve it in advance.

(ii) Upon a manufacturer's written request, prior to in-use testing, that presents information to EPA regarding pre-conditioning procedures designed solely to remove the effects of high sulfur in gasoline from vehicles produced through the 2007 model year, EPA will consider allowing such procedures on a case-by-case basis. EPA's decision will apply to manufacturer in-use testing conducted under this section and to any in-use testing conducted by EPA. Such procedures are not available for complete HDV. For model year 2007 and later Tier 2 vehicles, this provision can be used only in American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands, and then only if low sulfur gasoline is determined by the Administrator to be unavailable in that specific location.

(b) *Low-mileage testing*—(1) *Test groups.* Testing must be conducted for each test group.

(2) *Vehicle mileage.* All test vehicles must have a minimum odometer mileage of 10,000 miles.

(3) *Number of test vehicles.* For each test group, the minimum number of vehicles that must be tested is specified in Table S04-06 and Table S04-07 of this paragraph (b)(3). After testing the minimum number of vehicles of a specific test group as specified in Table S04-06 or S04-07 of this paragraph (b)(3), a manufacturer may test additional vehicles upon request and approval by the Agency prior to the initiation of the additional testing. Any additional testing must be completed within the testing completion requirements shown in § 86.1845-04(b)(4). The request and Agency approval (if any) shall apply to test groups on a case by case basis and apply only to testing under this paragraph. Separate approval will be required to test additional vehicles under paragraph (c) of this section. In addition to any testing that is required under Table S04-06 and Table S04-07, a manufacturer shall test one vehicle from each evaporative/refueling family for evaporative/refueling emissions. If a manufacturer believes it is unable to

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procure the test vehicles necessary to test the required number of vehicles in a test group, the manufacturer may request, subject to Administrator approval, a decreased sample size for that test group. The request shall include a description of the methods the manufacturer has used to procure the required number of vehicles. The ap-

proval of any such request, and the substitution of an alternative sample size requirement for the test group, will be based on a review of the procurement efforts made by the manufacturer to determine if all reasonable steps have been taken to procure the required test group size. Tables S04-06 and S04-07 follow:

TABLE S04-06—SMALL VOLUME MANUFACTURERS

49 and 50 State total sales ¹	1-5000	5001-14,999
Low Mileage	Voluntary	0
High Mileage	Voluntary	2

¹ Manufacturer's total annual sales.

TABLE S04-07—LARGE VOLUME MANUFACTURERS

49 and 50 State annual sales ¹	1-5000 ²	5001-14,999 ²	1-50,000 ³	50,001-250,000	>250,000
Low Mileage	Voluntary	0	2	3	4
High Mileage	Voluntary	2	4	5	6

¹ Sales by test group.

² Total annual production of groups eligible for testing under small volume sampling plan is capped at a maximum of 14,999 vehicle 49 or 50 state annual sales, or a maximum of 4,500 vehicle California only sales per model year, per large volume manufacturer.

³ Sampling plan applies to all of a manufacturer's remaining groups in this sales volume category when the maximum annual cap on total sales of small groups eligible for the small volume sampling plan is exceeded.

(4) *Completion of testing.* Testing of the vehicles in a test group and evaporative/refueling family must be completed within 12 months of the end of production of that test group (or evaporative/refueling family) for that model year.

(5) *Testing.* (i) Each test vehicle of a test group shall be tested in accordance with the FTP and the US06 portion of the SFTP as described in subpart B of this part, when such test vehicle is tested for compliance with applicable exhaust emission standards under this subpart. Test vehicles subject to applicable exhaust CO₂ emission standards under this subpart shall also be tested in accordance with the HFET as described in part 600, subpart B, of this chapter.

(ii) Manufacturers must measure PM emissions over the FTP and US06 driving schedules for at least 50 percent of the vehicles tested under paragraph (b)(5)(i) of this section.

(iii) Starting with model year 2018 vehicles, manufacturers must demonstrate compliance with the Tier 3 leak standard specified in § 86.1813, if applicable, as described in this para-

graph (b)(5)(iii). Manufacturers must evaluate each vehicle tested under paragraph (b)(5)(i) of this section, except that leak testing is not required for vehicles tested under paragraph (b)(5)(iv) of this section for diurnal emissions. In addition, manufacturers must evaluate at least one vehicle from each leak family for a given model year. Manufacturers may rely on OBD monitoring instead of testing as follows:

(A) A vehicle is considered to pass the leak test if the OBD system completed a leak check within the previous 750 miles of driving without showing a leak fault code.

(B) Whether or not a vehicle's OBD system has completed a leak check within the previous 750 miles of driving, the manufacturer may operate the vehicle as needed to force the OBD system to perform a leak check. If the OBD leak check does not show a leak fault, the vehicle is considered to pass the leak test.

(C) If the most recent OBD leak check from paragraph (b)(5)(iii)(A) or (B) of this section shows a leak-related fault code as specified in § 86.1806-17(b),

the vehicle is presumed to have failed the leak test. Manufacturers may perform the leak measurement procedure described in 40 CFR 1066.985 for an official result to replace the finding from the OBD leak check.

(D) Manufacturers may not perform repeat OBD checks or leak measurements to over-ride a failure under paragraph (b)(5)(iii)(C) of this section.

(iv) For nongaseous-fueled vehicles, one test vehicle of each evaporative/refueling family shall be tested in accordance with the supplemental 2-diurnal-plus-hot-soak evaporative emission and refueling emission procedures described in subpart B of this part, when such test vehicle is tested for compliance with applicable evaporative emission and refueling standards under this subpart. For gaseous-fueled vehicles, one test vehicle of each evaporative/refueling family shall be tested in accordance with the 3-diurnal-plus-hot-soak evaporative emission and refueling emission procedures described in subpart B of this part, when such test vehicle is tested for compliance with applicable evaporative emission and refueling standards under this subpart. The test vehicles tested to fulfill the evaporative/refueling testing requirement of this paragraph (b)(5)(ii) will be counted when determining compliance with the minimum number of vehicles as specified in Table S04-06 and Table S04-07 in paragraph (b)(3) of this section for testing under paragraph (b)(5)(i) of this section only if the vehicle is also tested for exhaust emissions under the requirements of paragraph (b)(5)(i) of this section.

(6) Each test vehicle not rejected based on the criteria specified in appendix II to this subpart shall be tested in as-received condition.

(7) A manufacturer may conduct subsequent diagnostic maintenance and/or testing of any vehicle. Any such maintenance and/or testing shall be reported to the Agency as specified in § 86.1847.

(c) *High-mileage testing*—(1) *Test groups*. Testing must be conducted for each test group.

(2) *Vehicle mileage*. All test vehicles must have a minimum odometer mileage of 50,000 miles. At least one vehicle of each test group must have a min-

imum odometer mileage of 105,000 miles or 75 percent of the full useful life mileage, whichever is less. See § 86.1838-01(c)(2) for small-volume manufacturer mileage requirements.

(3) *Number of test vehicles*. For each test group, the minimum number of vehicles that must be tested is specified in Table S04-06 and Table S04-07 in paragraph (b)(3) of this section. After testing the minimum number of vehicles of a specific test group as specified in Table S04-06 and Table S04-07 in paragraph (b)(3) of this section, a manufacturer may test additional vehicles upon request and approval by the Agency prior to the initiation of the additional testing. Any additional testing must be completed within the testing completion requirements shown in § 86.1845-04(c)(4). The request and Agency approval (if any) shall apply to test groups on a case by case basis and apply only to testing under this paragraph (c). In addition to any testing that is required under Table S04-06 and Table S04-07, a manufacturer shall test one vehicle from each evaporative/refueling family for evaporative/refueling emissions. If a manufacturer believes it is unable to procure the test vehicles necessary to test the required number of vehicles in a test group as specified in Table S04-06 or Table S04-07, the manufacturer may request, subject to Administrator approval, a decreased sample size for that test group. The request shall include a description of the methods the manufacturer has used to procure the required number of vehicles. The approval of any such request, and the substitution of an alternative sample size requirement for the test group, will be based on a review of the procurement efforts made by the manufacturer to determine if all reasonable steps have been taken to procure the required test group size.

(4) *Initiation and completion of testing*. Testing of a test group (or evaporative refueling family) must commence within 4 years of the end of production of the test group (or evaporative/refueling family) and be completed within 5 years of the end of production of the test group (or evaporative/refueling family).

(5) *Testing*. (i) Each test vehicle shall be tested in accordance with the FTP

and the US06 portion of the SFTP as described in subpart B of this part when such test vehicle is tested for compliance with applicable exhaust emission standards under this subpart. Test vehicles subject to applicable exhaust CO₂ emission standards under this subpart shall also be tested in accordance with the HFET as described in 40 CFR part 600, subpart B. One test vehicle from each test group shall be tested over the FTP at high altitude. The test vehicle tested at high altitude is not required to be one of the same test vehicles tested at low altitude. The test vehicle tested at high altitude is counted when determining the compliance with the requirements shown in Table S04-06 and Table S04-07 in paragraph (b)(3) of this section or the expanded sample size as provided for in this paragraph (c).

(ii) Manufacturers must measure PM emissions over the FTP and US06 driving schedules for at least 50 percent of the vehicles tested under paragraph (c)(5)(i) of this section.

(iii) Starting with model year 2018 vehicles, manufacturers must evaluate each vehicle tested under paragraph (c)(5)(i) of this section to demonstrate compliance with the Tier 3 leak standard specified in § 86.1813, except that leak testing is not required for vehicles tested under paragraph (c)(5)(iv) of this section for diurnal emissions. In addition, manufacturers must evaluate at least one vehicle from each leak family for a given model year. Manufacturers may rely on OBD monitoring instead of testing as described in paragraph (c)(5)(iii) of this section.

(iv) For nongaseous-fueled vehicles, one test vehicle of each evaporative/refueling family shall be tested in accordance with the supplemental 2-diurnal-plus-hot-soak evaporative emission procedures described in subpart B of this part, when such test vehicle is tested for compliance with applicable evaporative emission and refueling standards under this subpart. For gaseous-fueled vehicles, one test vehicle of each evaporative/refueling family shall be tested in accordance with the 3-diurnal-plus-hot-soak evaporative emission procedures described in subpart B of this part, when such test vehicle is tested for compliance with applicable

evaporative emission and refueling standards under this subpart. The test vehicles tested to fulfill the evaporative/refueling testing requirement of this paragraph (b)(5)(ii) will be counted when determining compliance with the minimum number of vehicles as specified in Table S04-06 and table S04-07 in paragraph (b)(3) of this section for testing under paragraph (b)(5)(i) of this section only if the vehicle is also tested for exhaust emissions under the requirements of paragraph (b)(5)(i) of this section.

(6) *Test condition.* Each test vehicle not rejected based on the criteria specified in appendix II to this subpart shall be tested in as-received condition.

(7) *Diagnostic maintenance.* A manufacturer may conduct subsequent diagnostic maintenance and/or testing on any vehicle. Any such maintenance and/or testing shall be reported to the Agency as specified in § 86.1847-01.

(d) *Test vehicle procurement.* (1) Vehicles tested under this section shall be procured pursuant to the provisions of this paragraph (d). Vehicles shall be procured from the group of persons who own or lease vehicles registered in the procurement area.

(2) Vehicles shall be procured from persons which own or lease the vehicle, excluding commercial owners/lessees which are owned or controlled by the vehicle manufacturer, using the procedures described in appendix I to this subpart. See § 86.1838(c)(2)(i) for small volume manufacturer requirements.

(3) *Geographical limitations.* (i) Test groups certified to 50-state standards: For low altitude testing no more than fifty percent of the test vehicles may be procured from California. The test vehicles procured from the 49 state area must be procured from a location with a heating degree day 30 year annual average equal to or greater than 4000.

(ii) Test groups certified to 49 state standards: The test vehicles procured from the 49 state area must be procured from a location with a heating degree day 30 year annual average equal to or greater than 4000.

(iii) Vehicles procured for high altitude testing may be procured from any area located above 4000 feet.

(4) Vehicles may be rejected for procurement or testing under this section if they meet one or more of the rejection criteria in appendix II to this subpart. Vehicles may also be rejected after testing under this section if they meet one or more of the rejection criteria in appendix II to this subpart. Any vehicle rejected after testing must be replaced in order that the number of test vehicles in the sample comply with the sample size requirements of this section. Any post-test vehicle rejection and replacement procurement and testing must take place within the testing completion requirements of this section.

(e) *Testing facilities, procedures, quality assurance and quality control*—(1) *Lab equipment and procedural requirements.* The manufacturer shall utilize a test laboratory that is in accordance with the equipment and procedural requirements of subpart B of this part to conduct the testing required by this section.

(2) The manufacturer shall notify the Agency of the name and location of the testing laboratory(s) to be used to conduct testing of vehicles of each model year conducted pursuant to this section. Such notification shall occur at least thirty working days prior to the initiation of testing of the vehicles of that model year.

(3) *Correlation.* The manufacturer shall document correlation traceable to the Environmental Protection Agency's National Vehicle and Fuel Emission Laboratory for its test laboratory utilized to conduct the testing required by this section.

(f)(1) A manufacturer must conduct in-use testing on a test group by determining NMOG exhaust emissions as described in 40 CFR 1066.635.

(2) For flexible-fueled vehicles certified to NMOG (or NMOG+NO_x) standards, the manufacturer may ask for EPA approval to demonstrate compliance using an equivalent NMOG emission result calculated from a ratio of ethanol NMOG exhaust emissions to gasoline NMHC exhaust emissions. Ethanol NMOG exhaust emissions are measured values from testing with the ethanol test fuel, expressed as NMOG. Gasoline NMHC exhaust emissions are measured values from testing with the

gasoline test fuel, expressed as NMHC. This ratio must be established during certification for each emission-data vehicle for the applicable test group. Use good engineering judgment to establish a different ratio for each duty cycle or test interval as appropriate. Identify the ratio values you develop under this paragraph (f)(1) and describe the duty cycle or test interval to which they apply in the Part II application for certification. Calculate the equivalent NMOG emission result by multiplying the measured gasoline NMHC exhaust emissions for a given duty cycle or test interval by the appropriate ratio.

(3) If the manufacturer measures NMOG as described in 40 CFR 1066.635(a), it must also measure and report HCHO emissions. As an alternative to measuring the HCHO content, if the manufacturer measures NMOG as permitted in 40 CFR 1066.635(c), the Administrator may approve, upon submission of supporting data by a manufacturer, the use of HCHO to NMHC ratios. To request the use of HCHO to NMHC ratios, the manufacturer must establish during certification testing the ratio of measured HCHO exhaust emissions to measured NMHC exhaust emissions for each emission-data vehicle for the applicable test group. The results must be submitted to the Administrator with the Part II application for certification. Following approval of the application for certification, the manufacturer may conduct in-use testing on the test group by measuring NMHC exhaust emissions rather than HCHO exhaust emissions. The measured NMHC exhaust emissions must be multiplied by the HCHO to NMHC ratio submitted in the application for certification for the test group to determine the equivalent HCHO exhaust emission values for the test vehicle. The equivalent HCHO exhaust emission values must be compared to the HCHO exhaust emission standard applicable to the test group.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6865, Feb. 10, 2000; 65 FR 59977, Oct. 6, 2000; 66 FR 19310, Apr. 13, 2001; 70 FR 72929, Dec. 8, 2005; 71 FR 78094, Dec. 28, 2006; 75 FR 25690, May 7, 2010; 79 FR 23730, Apr. 28, 2014]

§ 86.1846-01 Manufacturer in-use confirmatory testing requirements.

(a) *General requirements.* (1) Manufacturers must test, or cause testing to be conducted, under this section when the emission levels shown by a test group sample from testing under § 86.1845 exceeds the criteria specified in paragraph (b) of this section. The testing required under this section applies separately to each test group and at each test point (low and high mileage) that meets the specified criteria. The testing requirements apply separately for each model year. These provisions apply to heavy-duty vehicles starting with model year 2007. These provisions do not apply to emissions of CO₂, CH₄, and N₂O.

(2) The provisions of § 86.1845-04(a)(3) regarding fuel sulfur effects apply equally to testing under this section.

(b) *Criteria for additional testing.* (1) A manufacturer shall test a test group or a subset of a test group as described in paragraph (j) of this section when the results from testing conducted under § 86.1845 show mean exhaust emissions for that test group of any pollutant(s) (except CO₂, CH₄, and N₂O) to be equal to or greater than 1.30 times the applicable in-use standard and a failure rate, among the test group vehicles, for the corresponding pollutant(s) of fifty percent or greater.

(i) Additional testing is not required under this paragraph (b)(1) based on Supplemental FTP testing or evaporative/refueling testing. Testing conducted at high altitude under the requirements of § 86.1845-04(b) will be included in determining if a test group meets the criteria triggering testing required under this section.

(ii) The vehicle tested under the requirements of § 86.1845-04(c)(2) with a minimum odometer miles of 75% of useful life will not be included in determining if a test group meets the triggering criteria.

(iii) The SFTP composite emission levels shall include the IUVF FTP emissions, the IUVF US06 emissions, and the values from the SC03 Air Conditioning EDV certification test (without DFs applied). The calculations shall be made using the equations prescribed in § 86.164. If more than one set of certification SC03 data exists (due to

running change testing or other reasons), the manufacturer shall choose the SC03 result to use in the calculation from among those data sets using good engineering judgment.

(2) If fewer than 50 percent of the vehicles from a leak family pass either the leak test or the diurnal test under § 86.1845, EPA may require further leak testing under this paragraph (b)(2). Testing under this section must include five vehicles from the family. If all five of these vehicles fail the test, the manufacturer must test five additional vehicles.

EPA will determine whether to require further leak testing under this section after providing the manufacturer an opportunity to discuss the results, including consideration of any of the following information, or other items that may be relevant:

(i) Detailed system design, calibration, and operating information, technical explanations as to why the individual vehicles tested failed the leak standard.

(ii) Comparison of the subject vehicles to other similar models from the same manufacturer.

(iii) Data or other information on owner complaints, technical service bulletins, service campaigns, special policy warranty programs, warranty repair data, state I/M data, and data available from other manufacturer-specific programs or initiatives.

(iv) Evaporative emission test data on any individual vehicles that did not pass leak testing during IUVF.

(c) *Useful life.* Vehicles tested under the provisions of this section must be within the useful life specified for the emission standards which were exceeded in the testing under § 86.1845. Testing should be within the useful life specified, subject to sections 207(c)(5) and (c)(6) of the Clean Air Act where applicable.

(d) *Number of test vehicles.* A manufacturer must test a minimum of ten vehicles of the test group or Agency-designated subset. A manufacturer may, at the manufacturer's discretion, test more than ten vehicles under this paragraph for a specific test group or Agency-designated subset. If a manufacturer chooses to test more than the required

ten vehicles, all testing must be completed within the time designated in the testing completion requirements of paragraph (g) of this section. Any vehicles which are eliminated from the sample either prior to or subsequent to testing, or any vehicles for which test results are determined to be void, must be replaced in order that the final sample of vehicles for which test results acceptable to the Agency are available equals a minimum of ten vehicles. A manufacturer may cease testing with a sample of five vehicles if the results of the first five vehicles tested show mean emissions for each pollutant to be less than 75.0 percent of the applicable standard, with no vehicles exceeding the applicable standard for any pollutant.

(e) *Emission testing.* Each test vehicle of a test group or Agency-designated subset shall be tested in accordance with the FTP and/or the SFTP (whichever of these tests performed under § 86.1845 produces emission levels requiring testing under this section) as described in subpart B of this part, when such test vehicle is tested for compliance with applicable exhaust emission standards under this subpart.

(f) *Geographical limitations.* (1) Test groups or Agency-designated subsets certified to 50-state standards: For low altitude testing no more than 50 percent of the test vehicles may be procured from California. The test vehicles procured from the 49 state area must be procured from a location with a heating degree day 30 year annual average equal to or greater than 4000.

(2) Test groups or Agency-designated subsets certified to 49 state standards: For low-altitude testing all vehicles shall be procured from a location with a heating degree day 30 year annual average equal to or greater than 4000.

(3) Vehicles procured for high altitude testing may be procured from any area provided that the vehicle's primary area of operation was above 4000 feet.

(g) *Testing.* Testing required under this section must commence within three months of completion of the testing under § 86.1845 which triggered the confirmatory testing and must be completed within seven months of the completion of the testing which triggered

the confirmatory testing. Any industry review of the results obtained under § 86.1845 and any additional vehicle procurement and/or testing which takes place under the provisions of § 86.1845 which the industry believes may affect the triggering of required confirmatory testing must take place within the three month period. The data and the manufacturers reasoning for reconsideration of the data must be provided to the Agency within the three month period.

(h) *Limit on manufacturer conducted testing.* For each manufacturer, the maximum number of test group(s) (or Agency-designated subset(s)) of each model year for which testing under this section shall be required is limited to 50 percent of the total number of test groups of each model year required to be tested by each manufacturer as prescribed in § 86.1845, rounded to the next highest whole number where appropriate. For each manufacturer with only one test group under § 86.1845, such manufacturer shall have a maximum potential testing requirement under this section of one test group (or Agency-designated subset) per model year.

(i) *Testing plan.* Prior to beginning in-use confirmatory testing the manufacturer must, after consultation with the Agency, submit a written plan describing the details of the vehicle procurement, maintenance, and testing procedures (not otherwise specified by regulation) it intends to use. EPA must approve the test plan before the manufacturer may start further testing.

(j) *Testing a subset.* EPA may designate a subset of the test group based on transmission type for testing under this section in lieu of testing the entire test group when the results for the entire test group from testing conducted under § 86.1845 show mean emissions and a failure rate which meet these criteria for additional testing.

[79 FR 23732, Apr. 28, 2014]

§ 86.1847-01 Manufacturer in-use verification and in-use confirmatory testing; submittal of information and maintenance of records.

(a) The manufacturer who conducts or causes to be conducted testing of any motor vehicle under § 86.1845-01 shall establish, maintain and retain

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the following records organized and indexed by test group and evaporative/refueling family:

(1) A record documenting correlation as prescribed by § 86.1845-01(e)(3).

(2) A description of all laboratory equipment calibrations and verifications as prescribed by subpart B of this part or otherwise as appropriate using good engineering judgment.

(3) *Procurement documentation.* A description of the procurement area, a record of the source(s) of any list(s) of vehicles used as a basis for procurement, and a complete record of the number of vehicles rejected after positive vehicle owner response and reason(s) for manufacturer rejection of each rejected vehicle. A complete record of the number of vehicle owners/lessees in which attempt to contact was made and the number of vehicle owners/lessees actually contacted, the number of owners/lessees not contacted and the reasons and number of each for failure to contact, and the number of owners contacted who declined to participate.

(4) All records required to be maintained under this paragraph shall be retained by the manufacturer for a period of eight (8) years after the end of production of the test group to which they relate.

(b) The manufacturer who conducts or causes to be conducted testing of any motor vehicle under § 86.1845-01 shall submit to the Administrator on a quarterly calendar year basis, with the information provided to the Administrator within 30 days of the end of the quarter of each calendar year, the following records organized by test group and evaporative/refueling family.

(1) A complete record of all emission tests performed, including tests results, the date of each test, and the phase mass values for fuel economy, carbon dioxide and each pollutant measured by the Federal Test Procedure and Supplemental Federal Test Procedure as prescribed by subpart B of this part.

(2) For each test vehicle within a test group, a record and description of procedures and test results pertaining to any inspection (including the information listed in appendix III to this subpart), diagnostics, and maintenance

performed on the test vehicle prior to testing in as-received condition.

(3) A record and description of any inspection, diagnostics, and maintenance performed and/or testing (including emission results) of any vehicle tested subsequent to its initial as-received test.

(c) The manufacturer who conducts or causes to be conducted testing of any motor vehicle under § 86.1845-01 shall submit to the Administrator a record of the name and location of the testing laboratory(s) to be used to conduct testing for each model year 30 working days prior to the initiation of testing of that model year.

(d) The manufacturer of any test vehicle subject to § 86.1845-01 shall report to the Agency the test results (identifying the vehicle test group and emission test results) of any test vehicle in which the test vehicle fails to meet any applicable emission standard. The manufacturer must make this report within 72 hours of the completion of the testing of the test vehicle.

(e) The manufacturer who conducts or causes to be conducted testing of any motor vehicle under § 86.1846-01 shall establish, maintain and retain the following organized and indexed records by test group or Agency-designated subset.

(1) A description of all laboratory equipment calibrations and verifications as prescribed by subpart B of this part or by good engineering judgment.

(2) *Procurement documentation.* A description of the procurement area, a record of the source(s) of any list(s) of vehicles used as a basis for procurement, a complete record of: the number of vehicle owners/lessees in which attempt to contact was made and the number of vehicle owners/lessees actually contacted; the number of owners/lessees not contacted and the reasons and number of each for failure to contact; the number of owners contacted who declined to participate; and a complete record of the number of vehicles rejected after positive vehicle owner response and reason(s) for manufacturer rejection of each rejected vehicle.

(3) All records required to be maintained under this paragraph shall be retained by the manufacturer for a period of eight (8) years after the end of production of the test group to which they relate.

(f) Within 30 working days of the completion of testing of a test group or Agency-designated subset performed under § 86.1846-01, the manufacturer shall submit to the Administrator the following records organized by test group or Agency-designated subset.

(1) A complete record of all emission tests performed, including tests results, the date of each test, and the phase mass values for fuel economy, carbon dioxide and each pollutant measured by the Federal Test Procedure and Supplemental Federal Test Procedure as prescribed by subpart B of this part.

(2) For each test vehicle within a test group, a record and description of procedures and test results pertaining to any inspections, diagnostics, and maintenance performed on the test vehicle prior to any emission testing.

(3) A record and description of any inspections, diagnostics, maintenance performed and/or testing (including emission results) of any test vehicle tested subsequent to its initial emission test.

§ 86.1848-01 Certification.

(a)(1) If, after a review of the manufacturer's submitted Part I application, information obtained from any inspection, such other information as the Administrator may require, and any other pertinent data or information, the Administrator determines that the application is complete and that all vehicles within a test group as described in the application meet the requirements of this part and the Clean Air Act, the Administrator shall issue a certificate of conformity.

(2) If, after review of the manufacturer's application, request for certification, information obtained from any inspection, such other information as the Administrator may require, and any other pertinent data or information, the Administrator determines that the application is not complete or the vehicles within a test group as described in the application, do not meet

applicable requirements or standards of the Act or of this part, the Administrator may deny the issuance of, suspend, or revoke a previously issued certificate of conformity. The Administrator will notify the manufacturer in writing, setting forth the basis for the determination. The manufacturer may request a hearing on the Administrator's determination.

(b) A certificate of conformity will be issued by the Administrator for a period not to exceed one model year and upon such terms as deemed necessary or appropriate to assure that any new motor vehicle covered by the certificate will meet the requirements of the Act and of this part.

(c) All certificates are conditional upon the following conditions being met:

(1) The manufacturer must supply all required information according to the provisions of §§ 86.1843-01 and 86.1844-01.

(2) The manufacturer must comply with all certification and in-use emission standards contained in subparts S and H of this part both during and after model year production.

(3) The manufacturer must comply with all implementation schedules sales percentages as required in § 86.1810 or elsewhere in this part. Failure to meet a required implementation schedule sales percentage will be considered to be a failure to satisfy a condition upon which the certificate was issued and any vehicles or trucks sold in violation of the implementation schedule shall not be covered by the certificate.

(4) For incomplete light-duty trucks and incomplete heavy-duty vehicles, a certificate covers only those new motor vehicles which, when completed by having the primary load-carrying device or container attached, conform to the maximum curb weight and frontal area limitations described in the application for certification as required in § 86.1844-01.

(5) The manufacturer must meet the in-use testing and reporting requirements contained in §§ 86.1845-01, 86.1846-01, and 86.1847-01, as applicable. Failure to meet the in-use testing or reporting requirements shall be considered a failure to satisfy a condition upon which the certificate was issued. A vehicle or

truck will be considered to be covered by the certificate only if the manufacturer fulfills this condition upon which the certificate was issued.

(6) Vehicles are covered by a certificate of conformity only if they are in all material respects as described in the manufacturer's application for certification (Part I and Part II).

(7) For Tier 2 and interim non-Tier 2 vehicles, all certificates of conformity issued are conditional upon compliance with all provisions of §§ 86.1811-04, 86.1860-04, 86.1861-04 and 86.1862-04 both during and after model year production.

(i) Failure to meet the fleet average NO_x requirements of 0.07g/mi, 0.30 g/mi or 0.20 g/mi, as applicable, will be considered to be a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of the fleet average NO_x standard will not be covered by the certificate(s).

(ii) Failure to comply fully with the prohibition against selling credits that it has not generated or that are not available, as specified in § 86.1861-04, will be considered to be a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of this prohibition will not be covered by the certificate(s).

(iii) Failure to comply fully with the phase-in requirements of § 86.1811-04, will be considered to be a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold which do not comply with Tier 2 or interim non-Tier 2 requirements, up to the number needed to comply, will not be covered by the certificate(s).

(iv) For paragraphs (c)(7)(i) through (iii) of this section:

(A) The manufacturer must bear the burden of establishing to the satisfaction of the Administrator that the terms and conditions upon which the certificate(s) was (were) issued were satisfied.

(B) For recall and warranty purposes, vehicles not covered by a certificate of conformity will continue to be held to the standards stated or referenced in the certificate that otherwise would have applied to the vehicles.

(d) One certificate will be issued for each test group and evaporative/refueling family combination. For diesel fueled vehicles, one certificate will be issued for each test group. A certificate of conformity is deemed to cover the vehicles named in such certificate and produced during the model year.

(e) A manufacturer of new light-duty vehicles, light-duty trucks, and complete heavy-duty vehicles must obtain a certificate of conformity covering such vehicles from the Administrator prior to selling, offering for sale, introducing into commerce, delivering for introduction into commerce, or importing into the United States the new vehicle. Vehicles produced prior to the effective date of a certificate of conformity may also be covered by the certificate, once it is effective, if the following conditions are met:

(1) The vehicles conform in all respects to the vehicles described in the application for the certificate of conformity.

(2) The vehicles are not sold, offered for sale, introduced into commerce, or delivered for introduction into commerce prior to the effective date of the certificate of conformity.

(3) EPA is notified prior to the beginning of production when such production will start, and EPA is provided a full opportunity to inspect and/or test the vehicles during and after their production. EPA must have the opportunity to conduct SEA production line testing as if the vehicles had been produced after the effective date of the certificate.

(f) Vehicles imported by an original equipment manufacturer after December 31 of the calendar year for which the model year is named are still covered by the certificate of conformity as long as the production of the vehicle was completed before December 31 of that year.

(g) For test groups required to have an emission control diagnostic system, certification will not be granted if, for any emission data vehicle or other test vehicle approved by the Administrator in consultation with the manufacturer, the malfunction indicator light does not illuminate under any of the circumstances described in § 86.1806-01(k)(1) through (6).

(h) Vehicles equipped with aftertreatment technologies such as catalysts, otherwise covered by a certificate, which are driven outside the United States, Canada, and Mexico will be presumed to have been operated on leaded gasoline resulting in deactivation of such components as catalysts and oxygen sensors. If these vehicles are imported or offered for importation without retrofit of the catalyst or other aftertreatment technology, they will be considered not to be within the coverage of the certificate unless included in a catalyst or other aftertreatment technology control program operated by a manufacturer or a United States Government agency and approved by the Administrator.

(i) For all light-duty vehicles and light light-duty trucks certified to NLEV standards under §§ 86.1710 through 86.1712, the following provisions apply:

(1) All certificates issued are conditional upon manufacturer compliance with all provisions of §§ 86.1710 through 86.1712 both during and after model year production.

(2) Failure to meet the requirements of § 86.1710(a) through (d) will be considered to be a failure to satisfy the conditions upon which the certificate(s) was issued and the vehicles sold in violation of the fleet average NMOG standard shall not be covered by the certificate.

(3) Failure to comply fully with the prohibition against a manufacturer selling credits that it has not generated or are not available, as specified in § 86.1710(e), will be considered to be a failure to satisfy the conditions upon which the certificate(s) was issued and the vehicles sold in violation of this prohibition shall not be covered by the certificate.

(4) Failure to comply fully with the prohibition against offering for sale Tier 1 vehicles and TLEVs in the Northeast Trading Region, as defined in § 86.1702, after model year 2000 if vehicles with the same test groups are not certified and offered for sale in California in the same model year, as specified in § 86.1711(a), will be considered to be a failure to satisfy the conditions upon which the certificate(s) was issued and the vehicles sold in viola-

tion of this prohibition shall not be covered by the certificate.

(5)(i) The Administrator will issue a National LEV certificate of conformity for 2000 model year vehicles or engines certified to comply with the California TLEV emission standards.

(ii) This certificate of conformity shall be granted after the Administrator has received and reviewed the California Executive Order a manufacturer has received for the same vehicles or engines.

(iii) Vehicles or engines receiving a certificate of conformity under the provisions in this paragraph can only be sold in the states included in the NTR, as defined in § 86.1702, and those states where the sale of California-certified vehicles is otherwise authorized.

(6) The manufacturer shall bear the burden of establishing to the satisfaction of the Administrator that the conditions upon which the certificate was issued were satisfied.

(7) For recall and warranty purposes, vehicles not covered by a certificate because of a violation of these conditions of the certificate will continue to be held to the standards stated in the certificate that would have otherwise applied to the vehicles.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6866, Feb. 10, 2000; 65 FR 59977, Oct. 6, 2000]

§ 86.1848-10 Compliance with emission standards for the purpose of certification.

Section 86.1848-10 includes text that specifies requirements that differ from § 86.1848-01. Where a paragraph in § 86.1848-01 is identical and applicable to § 86.1848-10, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.1848-01.” Where a corresponding paragraph of § 86.1848-01 is not applicable, this is indicated by the statement “[Reserved]”

(a) through (b) [Reserved]. For guidance see § 86.1848-01.

(c) The following conditions apply to all certificates:

(1) The manufacturer must supply all required information according to the provisions of §§ 86.1843-01 and 86.1844-01.

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(2) The manufacturer must comply with all certification and in-use emission standards contained in subparts S and H of this part both during and after model year production.

(3) The manufacturer must comply with all implementation schedules sales percentages as required in § 86.1810 or elsewhere in this part. Failure to meet a required implementation schedule sales percentage will be considered to be a failure to satisfy a condition upon which the certificate was issued and any vehicles or trucks sold in violation of the implementation schedule are not to be covered by the certificate.

(4) For incomplete light-duty trucks and incomplete heavy-duty vehicles, a certificate covers only those new motor vehicles that, when completed by having the primary load-carrying device or container attached, conform to the maximum curb weight and frontal area limitations described in the application for certification as required in § 86.1844-01.

(5) The manufacturer must meet the in-use testing and reporting requirements contained in §§ 86.1845-01, 86.1846-01, and 86.1847-01, as applicable. Failure to meet the in-use testing or reporting requirements shall be considered a failure to satisfy a condition upon which the certificate was issued. A vehicle or truck is considered to be covered by the certificate only if the manufacturer fulfills this condition upon which the certificate was issued.

(6) Vehicles are covered by a certificate of conformity only if they are in all material respects as described in the manufacturer's application for certification (Part I and Part II).

(7) All certificates of conformity issued are conditional upon compliance with all the provisions of §§ 86.1811 through 86.1816 and §§ 86.1860 through 86.1862 both during and after model year production. The manufacturer bears the burden of establishing to the satisfaction of the Administrator that the terms and conditions upon which each certificate was issued were satisfied. For recall and warranty purposes, vehicles not covered by a certificate of conformity will continue to be held to the standards stated or referenced in

the certificate that otherwise would have applied to the vehicles.

(i) Failure to meet the applicable fleet average standard will be considered to be a failure to satisfy the terms and conditions upon which the certificate was issued and the vehicles sold in violation of the fleet average standard will not be covered by the certificate.

(ii) Failure to comply fully with the prohibition against selling credits that it has not generated or that are not available, as specified in § 86.1861, will be considered a failure to satisfy the terms and conditions upon which the certificate was issued and the vehicles sold in violation of this prohibition will not be covered by the certificate.

(iii) Failure to comply fully with the phase-in requirements of §§ 86.1811 through 86.1816 will be considered a failure to satisfy the terms and conditions upon which the certificate was issued and the vehicles sold that do not comply with the applicable standards, up to the number needed to comply, will not be covered by the certificate.

(8) For LDV/LLDTs and HLDV/MDPVs, all certificates of conformity issued are conditional upon compliance with all provisions of §§ 86.1811-10 and 86.1864-10 both during and after model year production. The manufacturer bears the burden of establishing to the satisfaction of the Administrator that the terms and conditions upon which the certificate(s) was (were) issued were satisfied. For recall and warranty purposes, vehicles not covered by a certificate of conformity will continue to be held to the standards stated or referenced in the certificate that otherwise would have applied to the vehicles.

(i) Failure to meet the fleet average cold temperature NMHC requirements will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of the fleet average NMHC standard will not be covered by the certificate(s).

(ii) Failure to comply fully with the prohibition against selling credits that are not generated or that are not available, as specified in § 86.1864-10, will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the

vehicles sold in violation of this prohibition will not be covered by the certificate(s).

(iii) Failure to comply fully with the phase-in requirements of § 86.1811-10 will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold that do not comply with cold temperature NMHC requirements, up to the number needed to comply, will not be covered by the certificate(s).

(9) For 2012 and later model year LDVs, LDTs, and MDPVs, all certificates of conformity issued are conditional upon compliance with all provisions of §§ 86.1818-12 and 86.1865-12 both during and after model year production. The manufacturer bears the burden of establishing to the satisfaction of the Administrator that the terms and conditions upon which the certificate(s) was (were) issued were satisfied. For recall and warranty purposes, vehicles not covered by a certificate of conformity will continue to be held to the standards stated or referenced in the certificate that otherwise would have applied to the vehicles.

(i) Failure to meet the fleet average CO₂ requirements will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of the fleet average CO₂ standard will not be covered by the certificate(s). The vehicles sold in violation will be determined according to § 86.1865-12(k)(8).

(ii) Failure to comply fully with the prohibition against selling credits that are not generated or that are not available, as specified in § 86.1865-12, will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of this prohibition will not be covered by the certificate(s).

(iii) For manufacturers using the conditional exemption under § 86.1801(k), failure to fully comply with the fleet production thresholds that determine eligibility for the exemption will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of the

stated sales and/or production thresholds will not be covered by the certificate(s).

(iv) For manufacturers that are determined to be operationally independent under § 86.1838(d), failure to report a material change in their status within 60 days as required by § 86.1838(d)(2) will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of the operationally independent criteria will not be covered by the certificate(s).

(v) For manufacturers subject to an alternative fleet average greenhouse gas exhaust emission standard approved under § 86.1818(g), failure to comply with the annual sales thresholds that are required to maintain use of those standards, including the thresholds required for new entrants into the U.S. market, will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of stated sales and/or production thresholds will not be covered by the certificate(s).

(d)-(i) [Reserved]. For guidance see § 86.1848-01.

[72 FR 8567, Feb. 26, 2007, as amended at 75 FR 25690, May 7, 2010; 76 FR 39522, July 6, 2011; 77 FR 63163, Oct. 15, 2012; 79 FR 23734, Apr. 28, 2014]

§ 86.1849-01 Right of entry.

(a) Any manufacturer who has applied for certification of a new motor vehicle subject to testing under this subpart, or any manufacturer or entity who conducts or causes to be conducted in-use verification or in-use confirmatory testing under this subpart, shall admit or cause to be admitted any EPA Enforcement Officer or any EPA authorized representative during operating hours on presentation of credentials to any of the following:

(1) Any facility where any such certification or in-use verification or in-use confirmatory testing or any procedures or activities connected with such testing are or were performed.

(2) Any facility where any new motor vehicle or test vehicle used for certification, in-use verification or in-use

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confirmatory testing which is being, was, or is to be tested is present.

(3) Any facility where any construction process or assembly process used in the modification or build up of such a vehicle into a certification vehicle is taking place or has taken place.

(4) Any facility where any record or other document relating to § 86.1849-01(a) (1), (2), and/or (3) is located.

(b) Upon admission to any facility referred to in paragraph (a) of this section, any EPA official or EPA authorized representative shall be allowed:

(1) To inspect and monitor any part or aspect of such procedures, activities, and testing facilities, including, but not limited to, monitoring vehicle pre-conditioning, emissions tests and mileage (or service) accumulation, bench aging, maintenance, and vehicle soak and storage procedures, and to verify correlation or calibration of test equipment.

(2) To inspect and make copies of any such records, designs, or other documents, including those records specified in §§ 86.1843-01, 86.1844-01, and 86.1847-01.

(c) In order to allow the Administrator to determine whether or not production motor vehicles conform to the conditions upon which a certificate of conformity has been issued, or conform in all material respects to the design specifications which applied to those vehicles described in the certification application for which a certificate of conformity has been issued to standards prescribed under section 202 of the Act, any manufacturer shall admit any EPA Enforcement Officer or EPA authorized representative on presentation of credentials to:

(1) Any facility where any document, design, or procedure relating to the translation of the design and construction of engines and emission-related components described in the compliance application or used for certification testing into production vehicles is located or carried on; and

(2) Any facility where any motor vehicles to be introduced into commerce are manufactured or assembled.

(d) Upon admission to any facility referred to in paragraph (c) of this section, any EPA Enforcement Officer or

EPA authorized representative shall be allowed:

(1) To inspect and monitor any aspects of such manufacture or assembly and other procedures;

(2) To inspect and make copies of any such records, documents or designs; and

(3) To inspect and photograph any part or aspect of any such new motor vehicles and any component used in the assembly thereof that are reasonably related to the purpose of the entry.

(e) Any EPA official or EPA authorized representative shall be furnished by those in charge of a facility being inspected with such reasonable assistance as he may request to help him discharge any function set forth in this paragraph. Each applicant for or recipient of certification is required to cause those in charge of a facility operated for its benefit to furnish such reasonable assistance without charge to EPA whether or not the applicant controls the facility.

(f) The duty to admit or cause to be admitted any EPA Enforcement Officer or EPA authorized representative applies whether or not the applicant owns or controls the facility in question and applies both to domestic and to foreign manufacturers and facilities. EPA will not attempt to make any inspections which it has been informed that local law forbids. However, if local law makes it impossible to what is necessary to insure the accuracy of data generated at a facility, no informed judgment that a vehicle is certifiable or is covered by a certificate can properly be based on those data. It is the responsibility of the manufacturer to locate its testing and manufacturing facilities in jurisdictions where this situation will not arise.

(g) For purposes of this section:

(1) "Presentation of credentials" shall mean display of the document designating a person as an EPA Enforcement Officer or EPA authorized representative.

(2) Where vehicle, component, or engine storage areas or facilities are concerned, "operating hours" shall mean all times during which personnel other than custodial personnel are at work in

the vicinity of the area or facility and have access to it.

(3) Where facilities or areas other than those covered by paragraph (g)(2) of this section are concerned, “operating hours” shall mean all times during which an assembly line is in operation or all times during which testing, maintenance, mileage (or service) accumulation, production or compilation of records, or any other procedure or activity related to certification testing, to translation of designs from the test stage to the production stage, or to vehicle (or engine) manufacture or assembly is being carried out in a facility.

(4) *Reasonable assistance* includes, but is not limited to, clerical, copying, interpretation and translation services, the making available upon request of personnel of the facility being inspected during their working hours to inform the EPA Enforcement Officer or EPA authorized representative of how the facility operates and to answer his questions, and the performance on request of emissions tests on any vehicle which is being, has been, or will be used for certification or in-use verification or confirmatory testing. Such tests shall be nondestructive, but may require appropriate mileage (or service) accumulation. A manufacturer may be compelled to cause the personal appearance of any employee at such a facility before an EPA Enforcement Officer or EPA authorized representative by written request for his appearance, signed by the Assistant Administrator for Air and Radiation or the Assistant Administrator for Enforcement and Compliance Assurance, served on the manufacturer. Any such employee who has been instructed by the manufacturer to appear will be entitled to be accompanied, represented, and advised by counsel.

§ 86.1850-01 Denial, suspension or revocation of certificate of conformity.

(a) If, after review of the manufacturer’s application, request for certification, information obtained from any inspection, such other information as the Administrator may require, and any other pertinent data or information, the Administrator determines that one or more test vehicles do not

meet applicable requirements or standards of the Act or of this part, the Administrator will notify the manufacturer in writing, setting forth the basis for the determination. The manufacturer may request a hearing on the Administrator’s determination.

(b) Notwithstanding the fact that the vehicles described in the application may comply with all other requirements of this subpart, the Administrator may deny issuance of, suspend, or revoke a previously issued certificate of conformity if the Administrator finds any one of the following infractions to be substantial:

(1) The manufacturer submits false or incomplete information.

(2) The manufacturer denies an EPA enforcement officer or EPA authorized representative the opportunity to conduct authorized inspections as required under § 86.1849-01.

(3) The manufacturer renders inaccurate any test data which it submits, or fails to make a good engineering judgment in accordance with § 86.1851-01(c)(1).

(4) The manufacturer denies an EPA enforcement officer or EPA authorized representative reasonable assistance as required in § 86.1849-01.

(5) The manufacturer fails to provide the records required in § 86.1844-01 to the Administrator within the deadline set forth in the request for such information.

(6) The manufacturer fails to comply with all conditions under which the certificate of conformity was granted as specified in 86.1848-01.

(7) The manufacturer otherwise circumvents the intent of the Act or of this part.

(c) The manufacturer shall bear the burden of establishing to the satisfaction of the Administrator that the conditions upon which the certificate was issued were satisfied, or that any failure to satisfy a condition is not substantial.

(d) If a manufacturer knowingly commits an infraction specified in paragraphs (b)(1) through (b)(7) of this section, knowingly commits any fraudulent act which results in the issuance of a certificate of conformity, or fails to comply with the conditions specified

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in § 86.1843-01, the Administrator may deem such certificate void ab initio.

(e) When the Administrator denies, suspends, revokes, or voids ab initio a certificate, EPA will provide the manufacturer a written determination. The manufacturer may request a hearing under § 86.1853-01 on the Administrator's decision.

(f) Any suspension or revocation of a certificate of conformity shall extend no further than to forbid the introduction into commerce of vehicles previously covered by the certificate which are still in the possession of the manufacturer, except in cases of such fraud or other misconduct that makes the certification void ab initio.

§ 86.1851-01 Application of good engineering judgment to manufacturers' decisions.

(a) The manufacturer shall exercise good engineering judgment in making all decisions called for under this subpart, including but not limited to selections, categorizations, determinations, and applications of the requirements of the subpart.

(b) Upon written request by the Administrator, the manufacturer shall provide within 15 working days (or such longer period as may be allowed by the Administrator) a written description of the engineering judgment in question.

(c) The Administrator may reject any such decision by a manufacturer if it is not based on good engineering judgment, or is otherwise inconsistent with the requirements of this subpart.

(d) If the Administrator rejects a decision by a manufacturer with respect to the exercise of good engineering judgment, the following provisions shall apply:

(1) If the Administrator determines that incorrect information was deliberately used in the decision process, that important information was deliberately overlooked, that the decision was not made in good faith, or that the decision was not made with a rational basis, the Administrator may suspend or void ab initio a certificate of conformity.

(2) If the Administrator determines that the manufacturer's decision does not meet the provisions of paragraph

(d)(1) of this section, but that a different decision would reflect a better exercise of good engineering judgment, then the Administrator will notify the manufacturer of this concern and the basis thereof.

(i) The manufacturer shall have at least 30 days to respond to this notice. The Administrator may extend this response period upon request from the manufacturer if it is necessary to generate additional data for the manufacturer's response.

(ii) The Administrator shall make the final ruling after considering the information provided by the manufacturer during the response period. If the Administrator determines that the manufacturer's decision was not made using good engineering judgment, he/she may reject that decision and apply the new ruling to future corresponding decisions as soon as practicable.

(e) The Administrator shall notify the manufacturer in writing regarding any decision reached under paragraph (d)(1) or (2) of this section. The Administrator shall include in this notification the basis for reaching the determination.

(f) Within 30 working days following receipt of notification of the Administrator's determinations made under paragraph (d) of this section, the manufacturer may request a hearing on those determinations. The request shall be in writing, signed by an authorized representative of the manufacturer, and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data or other analysis in support of such objections. If, after review of the request and supporting data or analysis, the Administrator finds that the request raises a substantial factual issue, he/she shall provide the manufacturer a hearing in accordance with § 86.1853-01 with respect to such issue.

§ 86.1852-01 Waivers for good in-use emission performance.

(a) The Administrator may waive requirements of this subpart relating to development of emission-related information or test data if the Administrator determines with confidence that the in-use emission test verification

data required in § 86.1845-01 are below the applicable emission standards for an appropriate period of time, and that such performance is likely to continue in subsequent model years.

(b) Any waiver granted under paragraph (a) of this section will be granted only if the Administrator determines that the waived requirement is not needed to assure continued emission compliance and the Administrator will have sufficient testing and other information in order to make certification decisions.

(c) Any waiver granted under paragraph (a) of this section would be limited in duration to a period of one model year, unless extended by the Administrator as a result of continued demonstrations of good in-use emission performance.

(d) The Administrator reserves the right to deny or revoke a waiver which may have been granted if he/she determines that the manufacturer no longer qualifies for the waiver.

§ 86.1853-01 Certification hearings.

(a)(1) After granting a request for a hearing under this subpart, the Administrator shall designate a Presiding Officer for the hearing.

(2) The hearing shall be held as soon as practicable at a time and place fixed by the Administrator or by the Presiding Officer.

(3) In the case of any hearing requested pursuant to § 86.1850-01(e), the Administrator may in his discretion direct that all argument and presentation of evidence be concluded within such fixed period not less than 30 days as he may establish from the date that the first written offer of a hearing is made to the manufacturer. To expedite proceedings, the Administrator may direct that the decision of the Presiding Officer (who may, but need not be the Administrator) shall be the final EPA decision.

(b)(1) Upon appointment pursuant to paragraph (a) of this section, the Presiding Officer will establish a hearing file. The file shall consist of the notice issued by the Administrator together with any accompanying material, the request for a hearing and the supporting data submitted therewith, and all documents relating to the request

for certification and all documents submitted therewith, and correspondence and other data material to the hearing.

(2) The hearing file will be available for inspection by the applicant at the office of the Presiding Officer.

(c) An applicant may appear in person, or may be represented by counsel or by any other duly authorized representative.

(d)(1) The Presiding Officer upon the request of any party, or in his discretion, may arrange for a prehearing conference at a time and place specified by him to consider the following:

- (i) Simplification of the issues;
- (ii) Stipulations, admissions of fact, and the introduction of documents;
- (iii) Limitation of the number of expert witnesses;
- (iv) Possibility of agreement disposing of all or any of the issues in dispute;

(v) Such other matters as may aid in the disposition of the hearing, including such additional tests as may be agreed upon by the parties.

(2) The results of the conference shall be reduced to writing by the Presiding Officer and made part of the record.

(e)(1) Hearings shall be conducted by the Presiding Officer in an informal but orderly and expeditious manner. The parties may offer oral or written evidence, subject to the exclusion by the Presiding Officer of irrelevant, immaterial and repetitious evidence.

(2) Witnesses will not be required to testify under oath. However, the Presiding Officer shall call to the attention of witnesses that their statements may be subject to the provisions of title 18 U.S.C. 1001 which imposes penalties for knowingly making false statements or representations, or using false documents in any matter within the jurisdiction of any department or agency of the United States.

(3) Any witness may be examined or cross-examined by the Presiding Officer, the parties, or their representatives.

(4) Hearings shall be reported verbatim. Copies of transcripts of proceedings may be purchased by the applicant from the reporter.

(5) All written statements, charts, tabulations, and similar data offered in

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evidence at the hearings shall, upon a showing satisfactory to the Presiding Officer of their authenticity, relevancy, and materiality, be received in evidence and shall constitute a part of the record.

(6) Oral argument may be permitted in the discretion of the Presiding Officer and shall be reported as part of the record unless otherwise ordered by the Presiding Officer.

(f)(1) The Presiding Officer shall make an initial decision which shall include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the record. The findings, conclusions, and written decision shall be provided to the parties and made a part of the record. The initial decision shall become the decision of the Administrator without further proceedings unless there is an appeal to the Administrator or motion for review by the Administrator within 20 days of the date the initial decision was filed.

(2) On appeal from or review of the initial decision the Administrator shall have all the powers which he would have in making the initial decision including the discretion to require or allow briefs, oral argument, the taking of additional evidence or the remanding to the Presiding Officer for additional proceedings. The decision by the Administrator shall include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the appeal or considered in the review.

§ 86.1854-12 Prohibited acts.

(a) The following acts and the causing thereof are prohibited:

(1) In the case of a manufacturer, as defined by § 86.1803, of new motor vehicles or new motor vehicle engines for distribution in commerce, the sale, or the offering for sale, or the introduction, or delivery for introduction, into commerce, or (in the case of any person, except as provided by regulation of the Administrator), the importation into the United States of any new motor vehicle or new motor vehicle engine subject to this subpart, unless such vehicle or engine is covered by a

certificate of conformity issued (and in effect) under regulations found in this subpart (except as provided in Section 203(b) of the Clean Air Act (42 U.S.C. 7522(b))) or regulations promulgated thereunder).

(2)(i) For any person to fail or refuse to permit access to or copying of records or to fail to make reports or provide information required under Section 208 of the Clean Air Act (42 U.S.C. 7542) with regard to vehicles.

(ii) For a person to fail or refuse to permit entry, testing, or inspection authorized under Section 206(c) (42 U.S.C. 7525(c)) or Section 208 of the Clean Air Act (42 U.S.C. 7542) with regard to vehicles.

(iii) For a person to fail or refuse to perform tests, or to have tests performed as required under Section 208 of the Clean Air Act (42 U.S.C. 7542) with regard to vehicles.

(iv) For a person to fail to establish or maintain records as required under §§ 86.1844, 86.1862, 86.1864, and 86.1865 with regard to vehicles.

(v) For any manufacturer to fail to make information available as provided by regulation under Section 202(m)(5) of the Clean Air Act (42 U.S.C. 7521(m)(5)) with regard to vehicles.

(3)(i) For any person to remove or render inoperative any device or element of design installed on or in a vehicle or engine in compliance with regulations under this subpart prior to its sale and delivery to the ultimate purchaser, or for any person knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser.

(ii) For any person to manufacture, sell or offer to sell, or install, any part or component intended for use with, or as part of, any vehicle or engine, where a principal effect of the part or component is to bypass, defeat, or render inoperative any device or element of design installed on or in a vehicle or engine in compliance with regulations issued under this subpart, and where the person knows or should know that the part or component is being offered for sale or installed for this use or put to such use.

(4) For any manufacturer of a vehicle or engine subject to standards prescribed under this subpart:

(i) To sell, offer for sale, introduce or deliver into commerce, or lease any such vehicle or engine unless the manufacturer has complied with the requirements of Section 207(a) and (b) of the Clean Air Act (42 U.S.C. 7541(a), (b)) with respect to such vehicle or engine, and unless a label or tag is affixed to such vehicle or engine in accordance with Section 207(c)(3) of the Clean Air Act (42 U.S.C. 7541(c)(3)).

(ii) To fail or refuse to comply with the requirements of Section 207 (c) or (e) of the Clean Air Act (42 U.S.C. 7541(c) or (e)).

(iii) Except as provided in Section 207(c)(3) of the Clean Air Act (42 U.S.C. 7541(c)(3)), to provide directly or indirectly in any communication to the ultimate purchaser or any subsequent purchaser that the coverage of a warranty under the Clean Air Act is conditioned upon use of any part, component, or system manufactured by the manufacturer or a person acting for the manufacturer or under its control, or conditioned upon service performed by such persons.

(iv) To fail or refuse to comply with the terms and conditions of the warranty under Section 207(a) or (b) of the Clean Air Act (42 U.S.C. 7541(a) or (b)).

(b) For the purposes of enforcement of this subpart, the following apply:

(1) No action with respect to any element of design referred to in paragraph (a)(3) of this section (including any adjustment or alteration of such element) shall be treated as a prohibited act under paragraph (a)(3) of this section if such action is in accordance with Section 215 of the Clean Air Act (42 U.S.C. 7549);

(2) Nothing in paragraph (a)(3) of this section is to be construed to require the use of manufacturer parts in maintaining or repairing a vehicle or engine. For the purposes of the preceding sentence, the term “manufacturer parts” means, with respect to a motor vehicle engine, parts produced or sold by the manufacturer of the motor vehicle or motor vehicle engine;

(3) Actions for the purpose of repair or replacement of a device or element of design or any other item are not

considered prohibited acts under paragraph (a)(3) of this section if the action is a necessary and temporary procedure, the device or element is replaced upon completion of the procedure, and the action results in the proper functioning of the device or element of design;

(4) Actions for the purpose of a conversion of a motor vehicle or motor vehicle engine for use of a clean alternative fuel (as defined in title II of the Clean Air Act) are not considered prohibited acts under paragraph (a) of this section if:

(i) The vehicle complies with the applicable standard when operating on the alternative fuel; and

(ii) In the case of engines converted to dual fuel or flexible use, the device or element is replaced upon completion of the conversion procedure, and the action results in proper functioning of the device or element when the motor vehicle operates on conventional fuel.

[75 FR 25691, May 7, 2010]

§§ 86.1855–86.1859 [Reserved]

§ 86.1860–04 How to comply with the Tier 2 and interim non-Tier 2 fleet average NO_x standards.

(a) The fleet average standards referred to in this section are the corporate fleet average standards for FTP exhaust NO_x emissions set forth in: § 86.1811–04(d) for Tier 2 LDV/Ts and MDPVs (0.07 g/mi); § 86.1811–04(1)(3) for interim non-Tier 2 LDV/LLDTs (0.30 g/mi); and, § 86.1811–04(1)(3) for interim non-Tier 2 HLDT/MDPVs (0.20 g/mi). Unless otherwise indicated in this section, the provisions of this section apply to all three corporate fleet average standards, except that the interim non-Tier 2 fleet average NO_x standards do not apply to a manufacturer whose U.S. LDV/T and MDPV sales are 100% Tier 2 LDV/Ts and MDPVs.

(b)(1) Each manufacturer must comply with the applicable fleet average NO_x standard, or standards, on a sales weighted average basis, at the end of each model year, using the procedure described in this section.

(2) During a phase-in year, the manufacturer must comply with the applicable fleet average NO_x standard for the required phase-in percentage for that

year as specified in § 86.1811-04(k)(1), or for the alternate phase-in percentage as permitted under § 86.1811-04(k)(6).

(c)(1)(i) Each manufacturer must separately compute the sales weighted averages of the individual NO_x emission standards to which it certified all its Tier 2 vehicles, interim non-Tier 2 LDV/LLDTs, and interim non-Tier 2 HLDT/MDPVs of a given model year as described in § 86.1804(l)(2).

(ii) For model years up to and including 2008, manufacturers must compute separate NO_x fleet averages for Tier 2 LDV/LLDTs and Tier 2 HLDT/MDPVs.

(2)(i) For model years up to and including 2008, if a manufacturer certifies its entire U.S. sales of Tier 2 or interim non-Tier 2 LDV/LLDTs or interim non-Tier 2 HLDT/MDPVs, to full useful life bins having NO_x standards at or below the applicable fleet average NO_x standard, that manufacturer may elect not to compute a fleet average NO_x level for that category of vehicles. A manufacturer making such an election must not generate NO_x credits for that category of vehicles for that model year.

(ii) For model years after 2008, if a manufacturer certifies its entire U.S. sales of Tier 2 vehicles to full useful life bins having NO_x standards at or below 0.07 gpm, that manufacturer may elect not to compute a fleet average NO_x level for its Tier 2 vehicles. A manufacturer making such an election must not generate NO_x credits for that model year.

(d) The sales weighted NO_x fleet averages determined pursuant to paragraph (c) of this section must be compared with the applicable fleet average standard; 0.07 g/mi for NO_x for Tier 2 LDV/Ts and MDPVs, 0.30 g/mi for NO_x for interim non-Tier 2 LDV/LLDTs, and 0.20 g/mi for NO_x for interim non-Tier 2 HLDT/MDPVs. Each manufacturer must comply on an annual basis with the fleet average standards by:

(1) Showing that its sales weighted average NO_x emissions of its LDV/LLDTs, HLDT/MDPVs or LDV/Ts, as applicable, are at or below the applicable fleet average standard; or

(2) If the sales weighted average is not at or below the applicable fleet average standard, by obtaining and applying sufficient Tier 2 NO_x credits, interim non-Tier 2 LDV/LLDT NO_x cred-

its or interim non-Tier 2 HLDT/MDPV NO_x credits, as appropriate, and as permitted under § 86.1861-04.

(i) Manufacturers may not use NMOG credits generated under the NLEV program in subpart R of this part to meet any Tier 2 or interim non-Tier 2 NO_x fleet average standard.

(ii) Tier 2 NO_x credits may not be used to meet any fleet average interim non-Tier 2 NO_x standard except as permitted by § 86.1860-04(e)(1).

(iii) Interim non-Tier 2 NO_x credits may not be used to meet the Tier 2 fleet average NO_x standard.

(iv) Interim non-Tier 2 NO_x credits from HLDT/MDPVs may not be used to meet the fleet average NO_x standard for interim non-Tier 2 LDV/LLDTs, and interim non-Tier 2 credits from LDV/LLDTs may not be used to meet the fleet average NO_x standard for interim non-Tier 2 HLDT/MDPVs.

(e) (1) Manufacturers that cannot meet the requirements of paragraph (d) of this section, may carry forward a credit deficit for three model years, but must not carry such deficit into the fourth year. When applying credits to reduce or eliminate a deficit under the fleet average standard for interim LDV/LLDTs or interim HLDT/MDPVs, that has been carried forward into a year subsequent to its generation, a manufacturer may apply credits from Tier 2 LDV/LLDTs or Tier 2 HLDT/MDPVs, respectively, as well as from the appropriate group of interim vehicles. A manufacturer must not use interim credits to reduce or eliminate any NO_x credit deficit under the Tier 2 fleet average standard.

(2) A manufacturer carrying a credit deficit into the third year must generate or obtain credits to offset that deficit and apply them to the deficit at a rate of 1.2:1, (i.e. deficits carried into the third model year must be repaid with credits equal to 120 percent of the deficit).

(3) A manufacturer must not bank credits for future model years or trade credits to another manufacturer during a model year into which it has carried a deficit.

(f) *Computing fleet average NO_x emissions.* (1) Manufacturers must separately compute these fleet NO_x averages using the equation contained in paragraph (f)(2) of this section:

(i) Their Tier 2 LDV/LLDT and Tier 2 HLDT/MDPV fleet average NO_x emissions for each model year through 2008;

(ii) Their combined Tier 2 LDV/T and MDPV fleet average NO_x emissions for each model year after 2008;

(iii) Their interim non-Tier 2 LDV/LLDT fleet average NO_x emissions for each model year through 2006; and

(iv) Their interim non-Tier 2 HLDT/MDPV fleet average NO_x emissions for each model year through 2008.

(2) The equation for computing fleet average NO_x emissions is as follows:

$$\frac{\sum (N \times \text{NO}_x \text{ emission standard})}{\text{Total number of vehicles of the appropriate category (e.g., all LDV/Ts and MDPVs, or interim non-Tier 2 HLDT/MDPVs, etc.) sold including HEVs and ZEVs}}$$

Where:

N = The number of vehicles sold in the applicable category that were certified for each corresponding NO_x emission bin. N must be based on vehicles counted to the point of first sale.

Emission standard = The individual full useful life NO_x emission standard for each bin for which the manufacturer had sales.

(3) The results of the calculation in paragraph (f)(2) of this section must be rounded as required by § 86.1837-01.

(4) When approved in advance by the Administrator, the numerator in the equation in paragraph (f)(2) of this section may be adjusted downward by the product of the number of HEVs from each NO_x emission bin times a HEV NO_x contribution factor determined through mathematical estimation of the reduction in NO_x emissions over the test procedure used to certify the HEVs. The reduction in NO_x emissions must be determined using good engineering judgement and reflect the relation in actual full useful life NO_x emissions to the full useful life NO_x standards for the certification bin applicable to the vehicles. The Administrator may require that calculation of the HEV NO_x contribution factor include vehicle parameters such as vehicle weight, portion of time during the test procedure that the HEV operates with zero exhaust emissions, zero emission range, NO_x emissions from fuel-fired heaters and NO_x emissions from electricity production and storage.

(g) *Additional credits for vehicles certified to 150,000 mile useful lives.* (1) A manufacturer may certify any test group to an optional useful life of 15 years or 150,000 miles, whichever occurs first.

(2)(i) For any test group certified to the optional 15 year/150,000 mile useful life, the manufacturer may generate additional NO_x credits, except as prohibited in paragraph (g)(3) of this section.

(ii) The manufacturer must calculate these extra NO_x credits, where permitted, by substituting an adjusted NO_x standard for the applicable NO_x standard from the full useful life certification bin when it calculates the applicable fleet average NO_x emissions by the procedure in paragraph (f) of this section. The adjusted standard must be equal to the applicable full useful life NO_x standard multiplied by 0.85 and rounded to one more decimal place than the number of decimal places as the applicable full useful life NO_x standard.

(3) A manufacturer electing not to comply with applicable intermediate life standards as permitted under § 86.1811-04(c)(4) may not generate additional credits from vehicles certified to a useful life of 15 years/150,000 miles; except that, for bins where such intermediate life standards do not exist or are specifically deemed to be optional in § 86.1811-04(c)(4), the manufacturer may generate additional NO_x credits

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from vehicles certified to a useful life of 15 years/150,000 miles.

(h) *Additional credits for vehicles certified to low bins.* A manufacturer may obtain additional NO_x credits by certifying vehicles to bins 1 and/or 2 in model years from 2001 through 2005 subject to the following requirements:

(1) When computing the fleet average Tier 2 NO_x emissions using the formula in paragraph (f)(2) of this section, the manufacturer may multiply the number of vehicles certified to bins 1 and 2 by the applicable multiplier shown in Table S04-11 when computing the denominator in the formula. These multipliers may not be used after model year 2005. The table follows:

TABLE S04-11—MULTIPLIERS FOR ADDITIONAL TIER 2 NO_x CREDITS FOR BIN 1 AND 2 LDV/TS

Bin	Model year	Multiplier 73
2	2001, 2002, 2003, 2004, 2005	1.5
1	2001, 2002, 2003, 2004, 2005	2.0

(2) Optionally, instead of the process described in paragraph (h)(1) of this section, when computing Tier 2 NO_x credits using the formula in § 86.1861-04(b)(1), the manufacturer may mul-

tiply the number of vehicles certified to bin 1 and bin 2 by the applicable multiplier shown in Table S04-11 in paragraph (h)(1) of this section when computing the “Total number of Tier 2 Vehicles Sold, Including ZEVs and HEVs”. These multipliers may not be used after model year 2005.

[65 FR 6866, Feb. 10, 2000, as amended at 66 FR 19310, Apr. 13, 2001]

§ 86.1860-17 How to comply with the Tier 3 fleet-average standards.

(a) You must show that you meet the applicable fleet-average NMOG+NO_x standards from §§ 86.1811 and 86.1816 and the fleet-average evaporative emission standards from § 86.1813 as described in this section. Note that separate fleet-average calculations are required for the FTP and SFTP exhaust emission standards under § 86.1811.

(b) Calculate your fleet-average value for each model year for all vehicle models subject to a separate fleet-average standard using the following equation, rounded to the nearest 0.001 g/mile for NMOG+NO_x emissions and the nearest 0.001 g/test for evaporative emissions:

$$\text{Fleet average value} = \frac{\sum_{i=1}^b (N_i \cdot FEL_i)}{N_{\text{total}}}$$

Where:

i = A counter associated with each separate Tier 3 test group or evaporative family.

b = The number of separate Tier 3 test groups or evaporative families from a given averaging set to which you certify your vehicles.

N_i = The actual nationwide sales for the model year for test group or evaporative family i . Include allowances for evaporative emissions as described in § 86.1813.

FEL_i = The FEL selected for test group or evaporative family i . Disregard any separate standards that apply for in-use testing or for testing under high-altitude conditions.

N_{total} = The actual nationwide sales for the model year for all your Tier 3 vehicles from the averaging set, except as described in paragraph (c) of this section. The pool of vehicle models included in N_{total} may vary by model year, and it may be different for evaporative standards, FTP exhaust standards, and SFTP exhaust standards in a given model year.

(c) Do not include any of the following vehicles to calculate your fleet-average value:

(1) Vehicles that you do not certify to the standards of this part because they are permanently exempted under 40 CFR part 85 or part 1068.

(2) Exported vehicles.

(3) Vehicles excluded under § 86.1801.

(4) For model year 2017, do not include vehicle sales in California or the section 177 states for calculating the fleet average value for evaporative emissions.

(d) Except as specified in paragraph (e) of this section, your calculated fleet-average value may not exceed the corresponding fleet-average standard for the model year.

(e) You may generate or use emission credits related to your calculated fleet-average value as follows:

(1) You may generate emission credits as described in § 86.1861 if your fleet-average value is below the corresponding fleet-average standard.

(2) You may use emission credits as described in § 86.1861 if your fleet-average value is above the corresponding fleet-average standard. Except as specified in paragraph (e)(3) of this section, you must use enough credits for each model year to show that your adjusted fleet average value does not exceed the fleet-average standard.

(3) The following provisions apply if you do not have enough emission credits to demonstrate compliance with a fleet-average standard in a given model year:

(i) You may have a credit deficit for up to three model years within an averaging set under § 86.1861-17(c). You may not bank emission credits with respect to a given emission standard during a model year in which you have a credit deficit in the same averaging set. If you fail to meet the fleet-average standard for four consecutive model years, the vehicles causing you to exceed the fleet-average standard will be considered not covered by the certificate of conformity. You will be subject to penalties on an individual-vehicle basis for sale of vehicles not covered by a certificate of conformity.

(ii) You must notify us in writing how you plan to eliminate the credit deficit within the specified time frame. If we determine that your plan is unreasonable or unrealistic, we may deny an application for certification for a test group or evaporative family if its bin standard or FEL would increase your credit deficit. We may determine that your plan is unreasonable or unrealistic based on a consideration of past

and projected use of specific technologies, the historical sales mix of your vehicle models, your commitment to limit sales of higher-emission vehicles, and expected access to traded credits. We may also consider your plan unreasonable if your fleet-average emission level increases relative to the first model year of a credit deficit or any later model year. We may require that you send us interim reports describing your progress toward resolving your credit deficit over the course of a model year.

(f) If the applicable bin standards and FELs for all your vehicle models are at or below a corresponding fleet-average standard for a given model year, and you do not want to generate emission credits, you may omit the calculations described in this section.

(g) For purposes of calculating the statute of limitations, the following actions are all considered to occur at the expiration of the deadline for offsetting a deficit as specified in paragraph (e)(3) of this section:

(1) Failing to meet the requirements of paragraph (e)(3) of this section.

(2) Failing to satisfy the conditions upon which a certificate was issued relative to offsetting a deficit.

(3) Selling, offering for sale, introducing or delivering into U.S. commerce, or importing vehicles that are found not to be covered by a certificate as a result of failing to offset a deficit.

[79 FR 23735, Apr. 23, 2014]

§ 86.1861-04 How do the Tier 2 and interim non-Tier 2 NO_x averaging, banking and trading programs work?

(a) *General provisions for Tier 2 credits and debits.* (1) A manufacturer whose Tier 2 fleet average NO_x emissions exceeds the 0.07 g/mile standard must complete the calculation at paragraph (b) of this section to determine the size of its NO_x credit deficit. A manufacturer whose Tier 2 fleet average NO_x emissions is less than or equal to the 0.07 g/mile standard must complete the calculation in paragraph (b) of this section if it desires to generate NO_x credits. In either case, the number of credits or debits determined in the calculation at paragraph (b) of this section

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must be rounded to the nearest whole number.

(2) Credits generated according to the calculation in paragraph (b)(1) of this section may be banked for future use or traded to another manufacturer.

(3) NO_x credits are not subject to any discount or expiration date except as required under the deficit carryforward provisions of § 86.1860-04(e)(2).

(4) If a manufacturer calculates that it has negative credits (debits or a credit deficit) for a given model year, it must obtain sufficient credits, as required under § 86.1860-04(e)(2), from vehicles produced by itself or another manufacturer in a model year no later than the third model year following the model year for which it calculated the credit deficit. (Example: if a manufacturer calculates that it has a NO_x credit deficit for the 2008 model year, it must obtain sufficient NO_x credits to offset that deficit from its own production or that of other manufacturers' 2011 or earlier model year vehicles.)

(6)(i) Manufacturers may not use NO_x credits to comply with the NLEV requirements of subpart R of this part.

(ii) Manufacturers may not use NMOG credits generated by vehicles certified to the NLEV requirements of subpart R of this part to comply with any NO_x requirements of this subpart.

(iii) Manufacturers may not use NO_x credits generated by interim non-Tier 2 vehicles to comply with the fleet average NO_x standard for Tier 2 vehicles.

(iv) Manufacturers may not use NO_x credits generated by Tier 2 vehicles to comply with any fleet average NO_x standard for interim non-Tier 2 vehicles, except as permitted under § 86.1860-04(e).

(v) Manufacturers may not use NO_x credits generated by interim non-Tier 2 LDV/LLDTs to comply with the fleet average NO_x standard for interim non-Tier 2 HLD/MDPVs.

(vi) Manufacturers may not use NO_x credits generated by interim non-Tier 2 HLD/MDPVs to comply with the fleet average NO_x standard for interim non-Tier 2 LDV/LLDTs.

(vii) Manufacturers may not use NO_x credits generated by Tier 2 LDV/LLDTs to comply with the Tier 2 NO_x average standard for HLD/MDPVs before the 2009 model year.

(viii) Manufacturers may not use NO_x credits generated by Tier 2 HLD/MDPVs to comply with the Tier 2 NO_x average standard for LDV/LLDTs before the 2009 model year.

(7) Manufacturers may bank Tier 2 NO_x credits for later use to meet the Tier 2 fleet average NO_x standard or trade them to another manufacturer. Credits are earned on the last day of the model year. Before trading or carrying over credits to the next model year, a manufacturer must apply available credits to offset any credit deficit, where the deadline to offset that credit deficit has not yet passed.

(8) There are no property rights associated with NO_x credits generated under this subpart. Credits are a limited authorization to emit the designated amount of emissions. Nothing in this part or any other provision of law should be construed to limit EPA's authority to terminate or limit this authorization through a rulemaking.

(b) *Calculating Tier 2 credits and debits.*

(1) Manufacturers that achieve fleet average NO_x values from the calculation in § 86.1860-04(f), lower than the applicable fleet average NO_x standard, may generate credits for a given model year, in units of vehicle-g/mi NO_x, determined in this equation:

$$[(\text{Fleet Average NO}_x \text{ Standard}) - (\text{Manufacturer's Fleet Average NO}_x \text{ Value})] \times (\text{Total Number of Tier 2 Vehicles Sold, Including ZEVs and HEVs}).$$

Where: The number of Tier 2 vehicles sold is based on the point of first sale and does not include vehicles sold in California or a state that adopts, and has in effect for that model year, California emission requirements.

(2) Where the result of the calculation in paragraph (b)(1) of this section is a negative number, the manufacturer must generate negative NO_x credits (debits).

(c) *Early banking.* (1)(i) Manufacturers may certify LDV/LLDTs to the Tier 2 FTP exhaust standards in § 86.1811-04 for model years 2001-2003 in order to bank credits for use in the 2004 and later model years. Such vehicles must also meet SFTP exhaust emission standards specified in § 86.1811-04.

(ii) Manufacturers may certify HLD/MDPVs to the Tier 2 FTP exhaust standards in § 86.1811-04 for model years 2001-2007 in order to bank credits for use in the 2008 and later model years. Such vehicles must also meet applicable SFTP exhaust emission standards specified in § 86.1811-04.

(iii) This process is referred to as "early banking" and the resultant credits are referred to as "early credits". In order to bank early credits, a manufacturer must comply with all exhaust emission standards and requirements applicable to Tier 2 LDV/LLDTs and/or HLD/MDPVs, as applicable, except as allowed under paragraph (c)(4) of this section.

(2) To generate early credits, a manufacturer must separately compute the sales weighted NO_x average of the LDV/LLDTs and HLD/MDPVs it certifies to the Tier 2 exhaust requirements and separately compute credits using the calculations in this section and in § 86.1860-04.

(3) Early HLD/MDPV credits may not be applied to LDV/LLDTs before the 2009 model year. Early LDV/LLDT credits may not be applied to HLD/MDPVs before the 2009 model year.

(4) Manufacturers may generate early Tier 2 credits from LDVs, LDT1s and LDT2s that are certified to a full useful life of 100,000 miles, provided that the credits are prorated by a multiplicative factor of 0.833 (the quotient of 100,000/120,000). Where a manufacturer has both 100,000 and 120,000 mile full useful life vehicles for which it desires to bank early credits, it must compute the credits from each group of vehicles separately and then add them together.

(5) Manufacturers may bank early credits for later use to meet the Tier 2 fleet average NO_x standard or trade them to another manufacturer subject to the restriction in paragraph (c)(3) of this section.

(6) Early credits must not be used to comply with the fleet average NO_x standards for interim non-Tier 2 vehicles.

(7) Nothing in this section prevents the use of the NMOG values of 2003 and earlier model year LDV/LLDTs from being used in calculations of the NMOG fleet average and subsequent NMOG

credit generation, under subpart R of this part.

(d) *Reporting and recordkeeping for Tier 2 NO_x credits including early credits.* Each manufacturer must comply with the reporting and recordkeeping requirements of § 86.1862-04.

(e) *Fleet average NO_x debits.* (1) Manufacturers must offset any debits for a given model year by the fleet average NO_x reporting deadline for the third model year following the model year in which the debits were generated as required in § 86.1860.04(e)(2). Manufacturers may offset debits by generating credits or acquiring credits generated by another manufacturer.

(2)(i) Failure to meet the requirements of paragraphs (a) through (d) of this section and of this paragraph (e), within the required timeframe for offsetting debits will be considered to be a failure to satisfy the conditions upon which the certificate(s) was issued and the individual noncomplying vehicles not covered by the certificate must be determined according to this section.

(ii) If debits are not offset within the specified time period, the number of vehicles not meeting the fleet average NO_x standards and not covered by the certificate must be calculated by dividing the total amount of debits for the model year by the fleet average NO_x standard applicable for the model year in which the debits were first incurred.

(iii) EPA will determine the vehicles for which the condition on the certificate was not satisfied by designating vehicles in those test groups with the highest certification NO_x emission values first and continuing until a number of vehicles equal to the calculated number of noncomplying vehicles as determined above is reached. If this calculation determines that only a portion of vehicles in a test group contribute to the debit situation, then EPA will designate actual vehicles in that test group as not covered by the certificate, starting with the last vehicle produced and counting backwards.

(3) If a manufacturer ceases production of LDV/Ts and MDPVs or is purchased by, merges with or otherwise combines with another manufacturer,

the manufacturer continues to be responsible for offsetting any debits outstanding within the required time period. Any failure to offset the debits will be considered to be a violation of paragraph (e)(1) of this section and may subject the manufacturer to an enforcement action for sale of vehicles not covered by a certificate, pursuant to paragraph (e)(2) of this section.

(4) For purposes of calculating the statute of limitations, a violation of the requirements of paragraph (e)(1) of this section, a failure to satisfy the conditions upon which a certificate(s) was issued and hence a sale of vehicles not covered by the certificate, all occur upon the expiration of the deadline for offsetting debits specified in paragraph (e)(1) of this section.

(f) *NO_x credit transfers.* (1) EPA may reject NO_x credit transfers if the involved manufacturers fail to submit the credit transfer notification in the annual report.

(2) A manufacturer may not sell credits that are not available for sale pursuant to the provisions in paragraphs (a)(2) and (a)(7) of this section.

(3) In the event of a negative credit balance resulting from a transaction, both the buyer and seller are liable, except in cases involving fraud. EPA may void *ab initio* the certificates of conformity of all engine families participating in such a trade.

(4)(i) If a manufacturer transfers a credit that it has not generated pursuant to paragraph (b) of this section or acquired from another party, the manufacturer will be considered to have generated a debit in the model year that the manufacturer transferred the credit. The manufacturer must offset such debits by the deadline for the annual report for that same model year.

(ii) Failure to offset the debits within the required time period will be considered a failure to satisfy the conditions upon which the certificate(s) was issued and will be addressed pursuant to paragraph (e) of this section.

(g) *Interim non-Tier 2 NO_x credits and debits; Interim non-Tier 2 averaging, banking and trading.* Interim non-Tier 2 NO_x credits must be generated, calculated, tracked, averaged, banked, traded, accounted for and reported upon separately from Tier 2 credits.

The provisions of this section applicable to Tier 2 NO_x credits and debits and Tier 2 averaging banking and trading are applicable to interim non-Tier 2 LDV/LLDTs and interim non-Tier 2 HLD/MDPVs with the following exceptions:

(1) Provisions for early banking under paragraph (c) of this section do not apply.

(2) The fleet average NO_x standard used for calculating credits is 0.30 grams per mile for interim non-Tier 2 LDV/LLDTs and 0.20 g/mi for interim non-Tier 2 HLD/MDPVs. (The interim non-Tier 2 NO_x standard of 0.30 (or 0.20) g/mi replaces 0.07 in the text and calculation in this section.)

(3) Interim non-Tier 2 NO_x credit deficits may be carried forward for three years subject to the requirements of § 86.1860-04(e).

[65 FR 6868, Feb. 10, 2000, as amended at 66 FR 19311, Apr. 13, 2001]

§ 86.1861-17 How do the NMOG+NO_x and evaporative emission credit programs work?

You may use emission credits for purposes of certification to show compliance with the applicable fleet-average NMOG+NO_x standards from §§ 86.1811 and 86.1816 and the fleet-average evaporative emission standards from § 86.1813 as described in 40 CFR part 1037, subpart H, with certain exceptions and clarifications as specified in this section. MDPVs are subject to the same provisions of this section that apply to LDT4.

(a) Calculate emission credits as described in this paragraph (a) instead of using the provisions of 40 CFR 1037.705. Calculate positive or negative emission credits relative to the applicable fleet-average standard. Calculate positive emission credits if your fleet-average level is below the standard. Calculate negative emission credits if your fleet-average value is above the standard. Calculate credits separately for each type of standard and for each averaging set. Calculate emission credits using the following equation, rounded to the nearest whole number:

$$\text{Emission credit} = \text{Volume}[\text{Fleet average standard} - \text{Fleet average value}]$$

Where:

Emission credit = The positive or negative credit for each discrete fleet-average standard, in units of vehicle-grams per mile for NMOG+NO_x and vehicle-grams per test for evaporative emissions.

Volume = Sales volume in a given model year from the collection of test groups or evaporative families covered by the fleet-average value, as described in § 86.1860.

(b) The following restrictions apply instead of those specified in 40 CFR 1037.740:

(1) Except as specified in paragraph (b)(3) of this section, emission credits may be exchanged only within an averaging set, as follows:

(i) HDV represent a separate averaging set with respect to all emission standards.

(ii) LDV and LDT certified to standards based on a useful life of 150,000 miles and 15 years together represent a single averaging set with respect to NMOG+NO_x emission standards. Note that FTP and SFTP credits are not interchangeable.

(iii) LDV and LDT1 certified to standards based on a useful life of 120,000 miles and 10 years together represent a single averaging set with respect to NMOG+NO_x emission standards. Note that FTP and SFTP credits are not interchangeable.

(iv) The following separate averaging sets apply for evaporative emission standards:

(A) LDV and LDT1 together represent a single averaging set.

(B) LDT2 represents a single averaging set.

(C) HLDT represents a single averaging set.

(D) HDV represents a single averaging set.

(2) You may exchange evaporative emission credits across averaging sets as follows if you need additional credits to offset a deficit after the final year of maintaining deficit credits as allowed under paragraph (c) of this section:

(i) You may exchange LDV/LDT1 and LDT2 emission credits.

(ii) You may exchange HLDT and HDV emission credits.

(3) Except as specified in paragraph (b)(4) of this section, credits expire after five years. For example, credits you generate in model year 2018 may be used only through model year 2023.

(4) For the Tier 3 declining fleet-average FTP and SFTP emission standards for NMOG+NO_x described in § 86.1811-17(b)(8), credits generated in model years 2017 through 2024 expire after eight years, or after model year 2030, whichever comes first; however, these credits may not be traded after five years. This extended credit life also applies for small-volume manufacturers generating credits under § 86.1811-17(h)(1) in model years 2022 through 2024. Note that the longer credit life does not apply for heavy-duty vehicles, for vehicles certified under the alternate phase-in described in § 86.1811-17(b)(9), or for vehicles generating early Tier 3 credits under § 86.1811-17(b)(11) in model year 2017.

(c) The credit-deficit provisions 40 CFR 1037.745 apply to the NMOG+NO_x and evaporative emission standards for Tier 3 vehicles.

(d) The reporting and recordkeeping provisions of § 86.1862 apply instead of those specified in 40 CFR 1037.730 and 1037.735.

(e) The provisions of 40 CFR 1037.645 do not apply.

[79 FR 23735, Apr. 23, 2014]

§ 86.1862-04 Maintenance of records and submittal of information relevant to compliance with fleet-average standards.

(a) *Overview.* This section describes reporting and recordkeeping requirements for vehicles subject to the following standards:

(1) Tier 2 NO_x emission standard for LDV and LDT in § 86.1811-04.

(2) Tier 3 FTP emission standard for NMOG+NO_x for LDV and LDT in § 86.1811.

(3) Tier 3 SFTP emission standard for NMOG+NO_x for LDV and LDT (including MDPV) in § 86.1811.

(4) Tier 3 evaporative emission standards in § 86.1813.

(5) Tier 3 FTP emission standard for NMOG+NO_x for HDV (other than MDPV) in § 86.1816.

(6) Cold temperature NMHC standards in § 86.1811.

(b) *Maintenance of records.* (1) The manufacturer producing any vehicles subject to a fleet-average standard under this subpart must establish and maintain all the following information

in organized and indexed records for each model year:

- (i) Model year.
- (ii) Applicable fleet-average standard.
- (iii) Calculated fleet-average value.
- (iv) All values used in calculating the fleet-average value achieved.

(2) The manufacturer producing any vehicle subject to the provisions in this section must keep all the following information for each vehicle:

- (i) Model year.
- (ii) Applicable fleet-average standard.
- (iii) EPA test group or evaporative family, as applicable.
- (iv) Assembly plant.
- (v) Vehicle identification number.
- (vi) The FEL and the fleet-average standard to which the vehicle is certified.
- (vii) Information on the point of first sale, including the purchaser, city, and state.

(3) The manufacturer must retain all records required to be maintained under this section for a period of eight years from the due date for the annual report. Records may be stored in any format and on any media, as long as manufacturers can promptly send EPA organized written records in English if we ask for them. Manufacturers must keep records readily available as EPA may review them at any time.

(4) The Administrator may require the manufacturer to retain additional records or submit information not specifically required by this section.

(5) EPA may void ab initio a certificate of conformity for a vehicle certified to emission standards as set forth or otherwise referenced in this subpart for which the manufacturer fails to retain the records required in this section, to provide such information to the Administrator upon request, or to submit the reports required in this section in the specified time period.

(c) *Reporting.* (1) Each manufacturer must submit an annual report. Except as provided in paragraph (b)(2) of this section, the annual report must contain, for each applicable fleet average standard, the fleet average value achieved, all values required to calculate the fleet-average value, the

number of credits generated or debits incurred, all the values required to calculate the credits or debits, and sufficient information to show compliance with all phase-in requirements, if applicable. The annual report must also contain the resulting balance of credits or debits.

(2) When a manufacturer calculates compliance with the fleet-average standard using the provisions in § 86.1860-04(c)(2) or § 86.1860-17(f), the annual report must state that the manufacturer has elected to use such provision and must contain the fleet-average standard as the fleet-average value for that model year.

(3) For each applicable fleet-average standard, the annual report must also include documentation on all credit transactions the manufacturer has engaged in since those included in the last report. Information for each transaction must include all the following information:

- (i) Name of credit provider.
- (ii) Name of credit recipient.
- (iii) Date the transfer occurred.
- (iv) Quantity of credits transferred.
- (v) Model year in which the credits were earned.

(4) Unless a manufacturer reports the data required by this section in the annual production report required under § 86.1844-01(e) and subsequent model year provisions, a manufacturer must submit an annual report for each model year after production ends for all affected vehicles produced by the manufacturer subject to the provisions of this subpart and no later than May 1 of the calendar year following the given model year. Annual reports must be submitted to: Director, Compliance Division, U.S. Environmental Protection Agency, 2000 Traverwood, Ann Arbor, Michigan 48105.

(5) Failure by a manufacturer to submit the annual report in the specified time period for all vehicles subject to the provisions in this section is a violation of Clean Air Act section 203(a)(1) (42 U.S.C 7522(a)(1)) for each subject vehicle produced by that manufacturer.

(6) If EPA or the manufacturer determines that a reporting error occurred on an annual report previously submitted to EPA, the manufacturer's

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credit or debit calculations will be recalculated. EPA may void erroneous credits, unless transferred, and must adjust erroneous debits. In the case of transferred erroneous credits, EPA must adjust the selling manufacturer's credit or debit balance to reflect the sale of such credits and any resulting generation of debits.

(d) *Notice of opportunity for hearing.* Any voiding of the certificate under paragraph (a)(6) of this section will be made only after EPA has offered the manufacturer concerned an opportunity for a hearing conducted in accordance with § 86.614 for light-duty vehicles and light-duty trucks and with 40 CFR part 1068, subpart G, for heavy-duty vehicles.

[79 FR 23735, Apr. 28, 2014]

§ 86.1863-07 Optional chassis certification for diesel vehicles.

This section does not apply for vehicles certified to the Tier 3 standards in § 86.1816-18, including those vehicles that certify to the Tier 3 standards before model year 2018.

(a) A manufacturer may optionally certify heavy-duty diesel vehicles 14,000 pounds GVWR or less to the standards specified in § 86.1816. Such vehicles must meet all the requirements of this subpart S that are applicable to Otto-cycle vehicles, except for evaporative, refueling, and OBD requirements where the diesel-specific OBD requirements would apply.

(b) For OBD, diesel vehicles optionally certified under this section are subject to the OBD requirements of § 86.1806.

(c) Diesel vehicles certified under this section may be tested using the test fuels, sampling systems, or analytical systems specified for diesel engines in subpart N of this part or in 40 CFR part 1065.

(d) Diesel vehicles optionally certified under this section to the standards of this subpart may not be included in any averaging, banking, or trading program for criteria emissions under this part.

(e) The provisions of § 86.004-40 apply to the engines in vehicles certified under this section.

(f) Diesel vehicles may be certified under this section to the standards ap-

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plicable to model year 2008 in earlier model years.

(g) Diesel vehicles optionally certified under this section in model years 2007, 2008, or 2009 shall be included in phase-in calculations specified in § 86.007-11(g).

(h) Diesel vehicles subject to the standards of 40 CFR 1037.104 are subject to the provisions of this subpart as specified in 40 CFR 1037.104.

(i) Non-petroleum fueled complete vehicles subject to the standards and requirements of this part under § 86.016-01(d)(5) are subject to the provisions of this section applicable to diesel-fueled heavy-duty vehicles.

[76 FR 57379, Sept. 15, 2011, as amended at 79 FR 23736, Apr. 28, 2014]

§ 86.1864-10 How to comply with the fleet average cold temperature NMHC standards.

(a) *Applicability.* Cold temperature NMHC exhaust emission standards apply to the following vehicles, subject to the phase-in requirements in § 86.1811-10(g)(3) and (4):

(1) 2010 and later model year LDV/LLDTs.

(2) 2012 and later model year HLDT/MDPVs.

(3) [Reserved]

(4) Vehicles imported by ICIs as defined in 40 CFR 85.1502.

(b) *Useful life requirements.* Full useful life requirements for cold temperature NMHC standards are defined in § 86.1805-04(g). There is not an intermediate useful life standard for cold temperature NMHC standards.

(c) *Altitude.* Altitude requirements for cold temperature NMHC standards are provided in § 86.1810-09(f).

(d) *Small volume manufacturer certification procedures.* Certification procedures for small volume manufacturers are provided in § 86.1838-01.

(e) *Cold temperature NMHC standards.* Fleet average cold temperature NMHC standards are provided in § 86.1811-10(g)(2).

(f) *Phase-in.* Phase-in of the cold temperature NMHC standards are provided in § 86.1811-10(g)(3) and (4).

(g) *Phase-in flexibilities for small volume manufacturers.* Phase-in flexibilities for small volume manufacturer compliance with the cold temperature

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NMHC standards are provided in § 86.1811-04(k)(5).

(h) *Hardship provisions for small volume manufacturers.* Hardship provisions for small volume manufacturers related to the cold temperature NMHC standards are provided in § 86.1811-04(q)(1).

(i) *In-use standards for applicable phase-in models.* In-use cold temperature NMHC standards for applicable phase-in models are provided in § 86.1811-10(u).

(j) *Durability procedures and method of determining deterioration factors (DFs).* The durability data vehicle selection procedures of § 86.1822-01 and the durability demonstration procedures of § 86.1823-06 apply for cold temperature NMHC standards. For determining compliance with full useful life cold temperature NMHC emission standards, the 68-86°F, 120,000 mile full useful life NMOG DF may be used.

(k) *Vehicle test procedure.* (1) The test procedure for demonstrating compliance with cold temperature NMHC standards is contained in subpart C of this part. With prior EPA approval, alternative testing procedures may be used, as specified in § 86.106-96(a), provided cold temperature NMHC emissions test results are equivalent or superior.

(2) Testing of all LDVs, LDTs and MDPVs to determine compliance with cold temperature NMHC exhaust emission standards set forth in this section must be on a loaded vehicle weight (LVW) basis, as defined in § 86.1803-01.

(3) Testing for the purpose of providing certification data is required only at low altitude conditions and only for vehicles that can operate on gasoline, except as requested in §§ 86.1810-09(f) and 86.1844-01(d)(11). If hardware and software emission control strategies used during low altitude condition testing are not used similarly across all altitudes for in-use operation, the manufacturer must include a statement in the application for certification, in accordance with §§ 86.1844-01(d)(11) and 86.1810-09(f), stating what the different strategies are and why they are used. If hardware and software emission control strategies used during testing with gasoline are not used similarly with all fuels that

can be used in multi-fuel vehicles, the manufacturer will include a statement in the application for certification, in accordance with §§ 86.1844-01(d)(11) and 86.1810-09(f), stating what the different strategies are and why they are used. For example, unless a manufacturer states otherwise, air pumps used to control emissions on dedicated gasoline vehicles or multi-fuel vehicles during low altitude conditions must also be used to control emissions at high altitude conditions, and software used to control emissions or closed loop operation must also operate similarly at low and high altitude conditions and similarly when multi-fueled vehicles are operated on gasoline and alternate fuels. These examples are for illustrative purposes only; similar strategies would apply to other currently used emission control technologies and/or emerging or future technologies.

(l) *Emission data vehicle (EDV) selection.* Provisions for selecting the appropriate EDV for the cold temperature NMHC standards are provided in §§ 86.1828-10(g) and 86.1829-01(b)(3).

(m) *Calculating the fleet average cold temperature NMHC standard.* Manufacturers must compute separate sales-weighted fleet average cold temperature NMHC emissions at the end of the model year for LDV/LLDTs and HLDT/MDPVs, using actual sales, and certifying test groups to FELs, as defined in § 86.1803-01. The FEL becomes the standard for each test group, and every test group can have a different FEL. The certification resolution for the FEL will be 0.1 grams/mile. LDVs and LLDTs must be grouped together when calculating the fleet average, and HLDTs and MDPVs must also be grouped together to determine the fleet average. Manufacturers must compute the sales-weighted cold temperature NMHC fleet averages using the following equation, rounded to the nearest 0.1 grams/mile:

Fleet average cold temperature NMHC exhaust emissions (grams/mile) = $\Sigma(N \times \text{FEL}) \div \text{Total number of vehicles sold of the applicable weight category (i.e., either LDV + LLDTs, or HLDT + MDPVs)}$

Where:

N = The number of LDVs and LLDTs, or HLDTs and MDPVs, sold within the applicable FEL, based on vehicles counted to the point of first sale.

FEL = Family Emission Limit (grams/mile).

(n) *Certification compliance and enforcement requirements for cold temperature NMHC standards.* (1) Compliance and enforcement requirements are provided in § 86.1864-10 and § 86.1848-10(c)(8).

(2) The certificate issued for each test group requires all vehicles within that test group to meet the emission standard or FEL to which the vehicles were certified.

(3) Each manufacturer must comply with the applicable cold temperature NMHC fleet average standard on a sales-weighted average basis, at the end of each model year, using the procedure described in paragraph (m) of this section.

(4) During a phase-in year, the manufacturer must comply with the applicable cold temperature NMHC fleet average standard for the required phase-in percentage for that year as specified in § 86.1811-10(g)(3) or (4).

(5) Manufacturers must compute separate cold temperature NMHC fleet averages for LDV/LLDTs and HLDT/MDPVs. The sales-weighted cold temperature NMHC fleet averages must be compared with the applicable fleet average standard.

(6) Each manufacturer must comply on an annual basis with the fleet average standards as follows:

(i) Manufacturers must report in their annual reports to the Agency that they met the relevant corporate average standard by showing that their sales-weighted average cold temperature NMHC emissions of LDV/LLDTs and HLDT/MDPVs, as applicable, are at or below the applicable fleet average standard;

(ii) If the sales-weighted average is above the applicable fleet average standard, manufacturers must obtain and apply sufficient NMHC credits as permitted under paragraph (o)(8) of this section. A manufacturer must show via the use of credits that they have offset any exceedence of the corporate average standard. Manufacturers must also include their credit balances or deficits.

(iii) If a manufacturer fails to meet the corporate average cold temperature NMHC standard for two consecutive years, the vehicles causing the corporate average exceedence will be considered not covered by the certificate of conformity (see paragraph (o)(8) of this section). A manufacturer will be subject to penalties on an individual-vehicle basis for sale of vehicles not covered by a certificate.

(iv) EPA will review each manufacturer's sales to designate the vehicles that caused the exceedence of the corporate average standard. EPA will designate as nonconforming those vehicles in test groups with the highest certification emission values first, continuing until reaching a number of vehicles equal to the calculated number of noncomplying vehicles as determined above. In a group where only a portion of vehicles would be deemed nonconforming, EPA will determine the actual nonconforming vehicles by counting backwards from the last vehicle produced in that test group. Manufacturers will be liable for penalties for each vehicle sold that is not covered by a certificate.

(o) *Requirements for the cold temperature NMHC averaging, banking and trading (ABT) program.* (1) Manufacturers must average the cold temperature NMHC emissions of their vehicles and comply with the cold temperature NMHC fleet average corporate standard. Manufacturers may generate credits during and after the phase-in period. Manufacturers may generate credits prior to the phase-in periods as described in paragraph (o)(5) of this section. A manufacturer whose cold temperature NMHC fleet average emissions exceed the applicable standard must complete the calculation in paragraph (o)(4) of this section to determine the size of its NMHC credit deficit. A manufacturer whose cold temperature NMHC fleet average emissions are less than the applicable standard must complete the calculation in paragraph (o)(4) of this section to generate NMHC credits.

(2) There are no property rights associated with NMHC credits generated under this subpart. Credits are a limited authorization to emit the designated amount of emissions. Nothing

in this part or any other provision of law should be construed to limit EPA's authority to terminate or limit this authorization through a rulemaking.

(3) Each manufacturer must comply with the reporting and recordkeeping requirements of paragraph (p) of this section for NMHC credits, including early credits. The averaging, banking and trading program is enforceable through the certificate of conformity that allows the manufacturer to introduce any regulated vehicles into commerce.

(4) Credits are earned on the last day of the model year. Manufacturers must calculate, for a given model year, the number of credits or debits it has generated according to the following equation, rounded to the nearest 0.1 grams/mile:

$$\text{NMHC Credits or Debits} = (\text{Cold Temperature NMHC Standard} - \text{Manufacturer's Sales-Weighted Fleet Average Cold Temperature NMHC Emissions}) \times (\text{Total Number of Vehicles Sold})$$

Where:

Cold Temperature NMHC Standard = 0.3 grams/mile for LDV/LLDTs or 0.5 grams/mile for HLDT/MDPV, per § 86.1811-10(g)(2).

Manufacturer's Sales-Weighted Fleet Average Cold Temperature NMHC Emissions = average calculated according to paragraph (m) of this section.

Total Number of Vehicles Sold = Total 50-State sales based on the point of first sale.

(5) The following provisions apply for early banking:

(i) Manufacturers may certify LDV/LLDTs to the cold temperature NMHC exhaust standards in § 86.1811-10(g)(2) for model years 2008-2009 to bank credits for use in the 2010 and later model years. Manufacturers may certify HLDT/MDPVs to the cold temperature NMHC exhaust standards in § 86.1811-10(g)(2) for model years 2010-2011 to bank credits for use in the 2012 and later model years.

(ii) This process is referred to as "early banking" and the resultant credits are referred to as "early credits." To bank early credits, a manufacturer must comply with all exhaust emission standards and requirements applicable to LDV/LLDTs and/or

HLDT/MDPVs. To generate early credits, a manufacturer must separately compute the sales-weighted cold temperature NMHC average of the LDV/LLDTs and HLDT/MDPVs it certifies to the exhaust requirements and separately compute credits using the calculations in paragraph (o)(4) of this section. Early HLDT/MDPV credits may not be applied to LDV/LLDTs before the 2010 model year. Early LDV/LLDT credits may not be applied to HLDT/MDPV before the 2012 model year.

(6) NMHC credits are not subject to any discount or expiration date except as required under the deficit carryforward provisions of paragraph (o)(8) of this section. There is no discounting of unused credits. NMHC credits have unlimited lives, subject to the limitations of paragraph (o)(2) of this section.

(7) Credits may be used as follows:

(i) Credits generated and calculated according to the method in paragraph (o)(4) of this section may be used only to offset deficits accrued with respect to the standard in § 86.1811-10(g)(2). Credits may be banked and used in a future model year in which a manufacturer's average cold temperature NMHC level exceeds the applicable standard. Credits may be exchanged between the LDV/LLDT and HLDT/MDPV fleets of a given manufacturer. Credits may also be traded to another manufacturer according to the provisions in paragraph (o)(9) of this section. Before trading or carrying over credits to the next model year, a manufacturer must apply available credits to offset any credit deficit, where the deadline to offset that credit deficit has not yet passed.

(ii) The use of credits shall not be permitted to address Selective Enforcement Auditing or in-use testing failures. The enforcement of the averaging standard occurs through the vehicle's certificate of conformity. A manufacturer's certificate of conformity is conditioned upon compliance with the averaging provisions. The certificate will be void ab initio if a manufacturer fails to meet the corporate average standard and does not obtain appropriate credits to cover its shortfall in that model year or in the subsequent

model year (see deficit carryforward provision in paragraph (o)(8) of this section). Manufacturers must track their certification levels and sales unless they produce only vehicles certified to cold temperature NMHC levels below the standard and do not plan to bank credits.

(8) The following provisions apply if debits are accrued:

(i) If a manufacturer calculates that it has negative credits (also called “debts” or a “credit deficit”) for a given model year, it may carry that deficit forward into the next model year. Such a carry-forward may only occur after the manufacturer exhausts any supply of banked credits. At the end of that next model year, the deficit must be covered with an appropriate number of credits that the manufacturer generates or purchases. Any remaining deficit is subject to an enforcement action, as described in this paragraph (o)(8). Manufacturers are not permitted to have a credit deficit for two consecutive years.

(ii) If debits are not offset within the specified time period, the number of vehicles not meeting the fleet average cold temperature NMHC standards (and therefore not covered by the certificate) must be calculated by dividing the total amount of debits for the model year by the fleet average cold temperature NMHC standard applicable for the model year in which the debits were first incurred.

(iii) EPA will determine the number of vehicles for which the condition on the certificate was not satisfied by designating vehicles in those test groups with the highest certification cold temperature NMHC emission values first and continuing until reaching a number of vehicles equal to the calculated number of noncomplying vehicles as determined above. If this calculation determines that only a portion of vehicles in a test group contribute to the debit situation, then EPA will designate actual vehicles in that test group as not covered by the certificate, starting with the last vehicle produced and counting backwards.

(iv)(A) If a manufacturer ceases production of LDV/LLDTs and HLDV/MDPVs, the manufacturer continues to be responsible for offsetting any debits

outstanding within the required time period. Any failure to offset the debits will be considered a violation of paragraph (o)(8)(i) of this section and may subject the manufacturer to an enforcement action for sale of vehicles not covered by a certificate, pursuant to paragraphs (o)(8)(ii) and (iii) of this section.

(B) If a manufacturer is purchased by, merges with, or otherwise combines with another manufacturer, the controlling entity is responsible for offsetting any debits outstanding within the required time period. Any failure to offset the debits will be considered a violation of paragraph (o)(8)(i) of this section and may subject the manufacturer to an enforcement action for sale of vehicles not covered by a certificate, pursuant to paragraphs (o)(8)(ii) and (iii) of this section.

(v) For purposes of calculating the statute of limitations, a violation of the requirements of paragraph (o)(8)(i) of this section, a failure to satisfy the conditions upon which a certificate(s) was issued and hence a sale of vehicles not covered by the certificate, all occur upon the expiration of the deadline for offsetting debits specified in paragraph (o)(8)(i) of this section.

(9) The following provisions apply to NMHC credit trading:

(i) EPA may reject NMHC credit trades if the involved manufacturers fail to submit the credit trade notification in the annual report. A manufacturer may not sell credits that are not available for sale pursuant to the provisions in paragraphs (o)(7)(i) of this section.

(ii) In the event of a negative credit balance resulting from a transaction that a manufacturer could not cover by the reporting deadline for the model year in which the trade occurred, both the buyer and seller are liable, except in cases involving fraud. EPA may void ab initio the certificates of conformity of all engine families participating in such a trade.

(iii) A manufacturer may only trade credits that it has generated pursuant to paragraph (o)(4) of this section or acquired from another party.

(p) *Reporting and recordkeeping.* Keep records and submit information for demonstrating compliance with the

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fleet average cold temperature NMHC standard as described in § 86.1862–04.

[72 FR 8567, Feb. 26, 2007, as amended at 76 FR 19874, Apr. 8, 2011; 79 FR 23736, Apr. 28, 2014]

§ 86.1865–12 How to comply with the fleet average CO₂ standards.

(a) *Applicability.* (1) Unless otherwise exempted under the provisions of § 86.1801–12(j) or (k), CO₂ fleet average exhaust emission standards of this subpart apply to:

- (i) 2012 and later model year passenger automobiles and light trucks.
- (ii) Heavy-duty vehicles subject to standards under 40 CFR 1037.104.
- (iii) Vehicles imported by ICIs as defined in 40 CFR 85.1502.

(2) The terms “passenger automobile” and “light truck” as used in this section have the meanings as defined in § 86.1818–12.

(b) *Useful life requirements.* Full useful life requirements for CO₂ standards are defined in § 86.1818–12. There is not an intermediate useful life standard for CO₂ emissions.

(c) *Altitude.* Altitude requirements for CO₂ standards are provided in § 86.1810–09(f).

(d) *Small volume manufacturer certification procedures.* Certification procedures for small volume manufacturers are provided in § 86.1838. Small businesses meeting certain criteria may be exempted from the greenhouse gas emission standards in § 86.1818 according to the provisions of § 86.1801–12(j) or (k).

(e) *CO₂ fleet average exhaust emission standards.* The fleet average standards referred to in this section are the corporate fleet average CO₂ standards for passenger automobiles and light trucks set forth in § 86.1818–12(c) and (e). The fleet average CO₂ standards applicable in a given model year are calculated separately for passenger automobiles and light trucks for each manufacturer and each model year according to the provisions in § 86.1818–12. Each manufacturer must comply with the applicable CO₂ fleet average standard on a production-weighted average basis, for each separate averaging set, at the end of each model year, using the procedure described in paragraph (j) of this section.

(f) *In-use CO₂ standards.* In-use CO₂ exhaust emission standards applicable to each model type are provided in § 86.1818–12(d).

(g) *Durability procedures and method of determining deterioration factors (DFs).* Deterioration factors for CO₂ exhaust emission standards are provided in § 86.1823–08(m).

(h) *Vehicle test procedures.* (1) The test procedures for demonstrating compliance with CO₂ exhaust emission standards are contained in subpart B of this part and subpart B of part 600 of this chapter.

(2) Testing of all passenger automobiles and light trucks to determine compliance with CO₂ exhaust emission standards set forth in this section must be on a loaded vehicle weight (LVW) basis, as defined in § 86.1803–01.

(3) Testing for the purpose of providing certification data is required only at low altitude conditions. If hardware and software emission control strategies used during low altitude condition testing are not used similarly across all altitudes for in-use operation, the manufacturer must include a statement in the application for certification, in accordance with § 86.1844–01(d)(11) and § 86.1810–09(f), stating what the different strategies are and why they are used.

(i) *Calculating the fleet average carbon-related exhaust emissions.* (1) Manufacturers must compute separate production-weighted fleet average carbon-related exhaust emissions at the end of the model year for passenger automobiles and light trucks, using actual production, where production means vehicles produced and delivered for sale, and certifying model types to standards as defined in § 86.1818–12. The model type carbon-related exhaust emission results determined according to 40 CFR part 600 subpart F (in units of grams per mile rounded to the nearest whole number) become the certification standard for each model type.

(2) Manufacturers must separately calculate production-weighted fleet average carbon-related exhaust emissions levels for the following averaging sets according to the provisions of part 600 subpart F of this chapter:

(i) Passenger automobiles subject to the fleet average CO₂ standards specified in § 86.1818-12(c)(2);

(ii) Light trucks subject to the fleet average CO₂ standards specified in § 86.1818-12(c)(3);

(iii) Passenger automobiles subject to the Temporary Leadtime Allowance Alternative Standards specified in § 86.1818-12(e), if applicable; and

(iv) Light trucks subject to the Temporary Leadtime Allowance Alternative Standards specified in § 86.1818-12(e), if applicable.

(j) *Certification compliance and enforcement requirements for CO₂ exhaust emission standards.* (1) Compliance and enforcement requirements are provided in this section and § 86.1848-10(c)(9).

(2) The certificate issued for each test group requires all model types within that test group to meet the in-use emission standards to which each model type is certified as outlined in § 86.1818-12(d).

(3) Each manufacturer must comply with the applicable CO₂ fleet average standard on a production-weighted average basis, at the end of each model year, using the procedure described in paragraph (i) of this section.

(4) Each manufacturer must comply on an annual basis with the fleet average standards as follows:

(i) Manufacturers must report in their annual reports to the Agency that they met the relevant corporate average standard by showing that their production-weighted average CO₂ emission levels of passenger automobiles, light trucks, and heavy-duty vehicles, as applicable, are at or below the applicable fleet average standards; or

(ii) If the production-weighted average is above the applicable fleet average standard, manufacturers must obtain and apply sufficient CO₂ credits as authorized under paragraph (k)(8) of this section. A manufacturer must show that they have offset any exceedence of the corporate average standard via the use of credits. Manufacturers must also include their credit balances or deficits in their annual report to the Agency.

(iii) If a manufacturer fails to meet the corporate average CO₂ standard for four consecutive years, the vehicles causing the corporate average

exceedence will be considered not covered by the certificate of conformity (*see* paragraph (k)(8) of this section). A manufacturer will be subject to penalties on an individual-vehicle basis for sale of vehicles not covered by a certificate.

(iv) EPA will review each manufacturer's production to designate the vehicles that caused the exceedence of the corporate average standard. EPA will designate as nonconforming those vehicles in test groups with the highest certification emission values first, continuing until reaching a number of vehicles equal to the calculated number of noncomplying vehicles as determined in paragraph (k)(8) of this section. In a group where only a portion of vehicles would be deemed nonconforming, EPA will determine the actual nonconforming vehicles by counting backwards from the last vehicle produced in that test group. Manufacturers will be liable for penalties for each vehicle sold that is not covered by a certificate.

(k) *Requirements for the CO₂ averaging, banking and trading (ABT) program.* (1) A manufacturer whose CO₂ fleet average emissions exceed the applicable standard must complete the calculation in paragraph (k)(4) of this section to determine the size of its CO₂ deficit. A manufacturer whose CO₂ fleet average emissions are less than the applicable standard must complete the calculation in paragraph (k)(4) of this section to generate CO₂ credits. In either case, the number of credits or debits must be rounded to the nearest whole number.

(2) There are no property rights associated with CO₂ credits generated under this subpart. Credits are a limited authorization to emit the designated amount of emissions. Nothing in this part or any other provision of law should be construed to limit EPA's authority to terminate or limit this authorization through a rulemaking.

(3) Each manufacturer must comply with the reporting and recordkeeping requirements of paragraph (l) of this section for CO₂ credits, including early credits. The averaging, banking and trading program is enforceable through

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the certificate of conformity that allows the manufacturer to introduce any regulated vehicles into commerce.

(4) Credits are earned on the last day of the model year. Manufacturers must calculate, for a given model year and separately for passenger automobiles, light trucks, and heavy-duty vehicles (as specified in 40 CFR 1037.104), the number of credits or debits it has generated according to the following equation rounded to the nearest megagram:

$$\text{CO}_2 \text{ Credits or Debits (Mg)} = [(\text{CO}_2 \text{ Standard—Manufacturer's Production-Weighted Fleet Average CO}_2 \text{ Emissions}) \times (\text{Total Number of Vehicles Produced}) \times (\text{Vehicle Lifetime Miles})] \div 1,000,000$$

Where:

CO₂ Standard = the applicable standard for the model year as determined by § 86.1818–12;

Manufacturer's Production-Weighted Fleet Average CO₂ Emissions = average calculated according to paragraph (i) of this section;

Total Number of Vehicles Produced = The number of vehicles domestically produced plus those imported as defined in § 600.511–80 of this chapter; and

Vehicle Lifetime Miles is 195,264 for passenger automobiles and 225,865 for light trucks.

(5) Total credits or debits generated in a model year, maintained and reported separately for passenger automobiles and light trucks, shall be the sum of the credits or debits calculated in paragraph (k)(4) of this section and any of the following credits, if applicable, minus any N₂O and/or CH₄ CO₂-equivalent debits calculated according to the provisions of § 86.1818–12(f)(4):

(i) Air conditioning leakage credits earned according to the provisions of § 86.1867–12(b);

(ii) Air conditioning efficiency credits earned according to the provisions of § 86.1868–12(c);

(iii) Off-cycle technology credits earned according to the provisions of § 86.1869–12(d).

(iv) Full size pickup truck credits earned according to the provisions of § 86.1870–12(c).

(v) N₂O and/or CH₄ CO₂-equivalent debits accumulated according to the provisions of § 86.1818–12(f)(4).

(6) The expiration date of unused CO₂ credits is based on the model year in which the credits are earned, as follows:

(i) Unused CO₂ credits from the 2009 model year shall retain their full value through the 2014 model year. Credits from the 2009 model year that remain at the end of the 2014 model year shall expire.

(ii) Unused CO₂ credits from the 2010 through 2015 model years shall retain their full value through the 2021 model year. Credits remaining from these model years at the end of the 2021 model year shall expire.

(iii) Unused CO₂ credits from the 2016 and later model years shall retain their full value through the five subsequent model years after the model year in which they were generated. Credits remaining at the end of the fifth model year after the model year in which they were generated shall expire.

(7) Credits may be used as follows:

(i) Credits generated and calculated according to the method in paragraphs (k)(4) and (5) of this section may not be used to offset deficits other than those deficits accrued with respect to the standard in § 86.1818. Credits may be banked and used in a future model year in which a manufacturer's average CO₂ level exceeds the applicable standard. Credits may be transferred between the passenger automobile and light truck fleets of a given manufacturer. Credits may also be traded to another manufacturer according to the provisions in paragraph (k)(8) of this section. Before trading or carrying over credits to the next model year, a manufacturer must apply available credits to offset any deficit, where the deadline to offset that credit deficit has not yet passed.

(ii) The use of credits shall not change Selective Enforcement Auditing or in-use testing failures from a failure to a non-failure. The enforcement of the averaging standard occurs through the vehicle's certificate of conformity. A manufacturer's certificate of conformity is conditioned upon compliance with the averaging provisions. The certificate will be void ab initio if a manufacturer fails to meet the corporate average standard and does not obtain appropriate credits to cover its shortfalls in that model year

or subsequent model years (see deficit carry-forward provisions in paragraph (k)(8) of this section).

(iii) *Special provisions for manufacturers using the Temporary Leadtime Allowance Alternative Standards.* (A) Credits generated by vehicles subject to the fleet average CO₂ standards specified in § 86.1818-12(c) may only be used to offset a deficit generated by vehicles subject to the Temporary Leadtime Allowance Alternative Standards specified in § 86.1818-12(e).

(B) Credits generated by a passenger automobile or light truck averaging set subject to the Temporary Leadtime Allowance Alternative Standards specified in § 86.1818-12(e)(4)(i) or (ii) of this section may be used to offset a deficit generated by an averaging set subject to the Temporary Leadtime Allowance Alternative Standards through the 2015 model year, except that manufacturers qualifying under the provisions of § 86.1818-12(e)(3) may use such credits to offset a deficit generated by an averaging set subject to the Temporary Leadtime Allowance Alternative Standards through the 2016 model year.

(C) Credits generated by an averaging set subject to the Temporary Leadtime Allowance Alternative Standards specified in § 86.1818-12(e)(4)(i) or (ii) of this section may not be used to offset a deficit generated by an averaging set subject to the fleet average CO₂ standards specified in § 86.1818-12(c)(2) or (3) or otherwise transferred to an averaging set subject to the fleet average CO₂ standards specified in § 86.1818-12(c)(2) or (3).

(D) Credits generated by vehicles subject to the Temporary Leadtime Allowance Alternative Standards specified in § 86.1818-12(e)(4)(i) or (ii) may be banked for use in a future model year (to offset a deficit generated by an averaging set subject to the Temporary Leadtime Allowance Alternative Standards). All such credits shall expire at the end of the 2015 model year, except that manufacturers qualifying under the provisions of § 86.1818-12(e)(3) may use such credits to offset a deficit generated by an averaging set subject to the Temporary Leadtime Allowance Alternative Standards through the 2016 model year.

(E) A manufacturer with any vehicles subject to the Temporary Leadtime Allowance Alternative Standards specified in § 86.1818-12(e)(4)(i) or (ii) of this section in a model year in which that manufacturer also generates credits with vehicles subject to the fleet average CO₂ standards specified in § 86.1818-12(c) may not trade or bank credits earned against the fleet average standards in § 86.1818-12(c) for use in a future model year.

(iv) Credits generated in the 2017 through 2020 model years under the provisions of § 86.1818(e)(3)(ii) may not be traded or otherwise provided to another manufacturer.

(v) Credits generated under any alternative fleet average standards approved under § 86.1818(g) may not be traded or otherwise provided to another manufacturer.

(8) The following provisions apply if debits are accrued:

(i) If a manufacturer calculates that it has negative credits (also called “debts” or a “credit deficit”) for a given model year, it may carry that deficit forward into the next three model years. Such a carry-forward may only occur after the manufacturer exhausts any supply of banked credits. At the end of the third model year, the deficit must be covered with an appropriate number of credits that the manufacturer generates or purchases. Any remaining deficit is subject to a voiding of the certificate ab initio, as described in this paragraph (k)(8). Manufacturers are not permitted to have a credit deficit for four consecutive years.

(ii) If debits are not offset within the specified time period, the number of vehicles not meeting the fleet average CO₂ standards (and therefore not covered by the certificate) must be calculated.

(A) Determine the gram per mile quantity of debits for the noncompliant vehicle category by multiplying the total megagram deficit by 1,000,000 and then dividing by the vehicle lifetime miles for the vehicle category (passenger automobile or light truck) specified in paragraph (k)(4) of this section.

(B) Divide the result by the fleet average standard applicable to the model

year in which the debits were first incurred and round to the nearest whole number to determine the number of vehicles not meeting the fleet average CO₂ standards.

(iii) EPA will determine the vehicles not covered by a certificate because the condition on the certificate was not satisfied by designating vehicles in those test groups with the highest carbon-related exhaust emission values first and continuing until reaching a number of vehicles equal to the calculated number of non-complying vehicles as determined in this paragraph (k)(8). If this calculation determines that only a portion of vehicles in a test group contribute to the debit situation, then EPA will designate actual vehicles in that test group as not covered by the certificate, starting with the last vehicle produced and counting backwards.

(iv)(A) If a manufacturer ceases production of passenger automobiles, light trucks, or heavy-duty vehicles subject to the standards of 40 CFR 1037.104, the manufacturer continues to be responsible for offsetting any debits outstanding within the required time period. Any failure to offset the debits will be considered a violation of paragraph (k)(8)(i) of this section and may subject the manufacturer to an enforcement action for sale of vehicles not covered by a certificate, pursuant to paragraphs (k)(8)(ii) and (iii) of this section.

(B) If a manufacturer is purchased by, merges with, or otherwise combines with another manufacturer, the controlling entity is responsible for offsetting any debits outstanding within the required time period. Any failure to offset the debits will be considered a violation of paragraph (k)(8)(i) of this section and may subject the manufacturer to an enforcement action for sale of vehicles not covered by a certificate, pursuant to paragraphs (k)(8)(ii) and (iii) of this section.

(v) For purposes of calculating the statute of limitations, a violation of the requirements of paragraph (k)(8)(i) of this section, a failure to satisfy the conditions upon which a certificate(s) was issued and hence a sale of vehicles not covered by the certificate, all occur upon the expiration of the dead-

line for offsetting debits specified in paragraph (k)(8)(i) of this section.

(9) The following provisions apply to CO₂ credit trading:

(i) EPA may reject CO₂ credit trades if the involved manufacturers fail to submit the credit trade notification in the annual report.

(ii) A manufacturer may not sell credits that are not available for sale pursuant to the provisions in paragraph (k)(6) of this section.

(iii) In the event of a negative credit balance resulting from a transaction, both the buyer and seller are liable. EPA may void ab initio the certificates of conformity of all test groups participating in such a trade.

(iv) (A) If a manufacturer trades a credit that it has not generated pursuant to paragraph (k) of this section or acquired from another party, the manufacturer will be considered to have generated a debit in the model year that the manufacturer traded the credit. The manufacturer must offset such debits by the deadline for the annual report for that same model year.

(B) Failure to offset the debits within the required time period will be considered a failure to satisfy the conditions upon which the certificate(s) was issued and will be addressed pursuant to paragraph (k)(8) of this section.

(v) A manufacturer may only trade credits that it has generated pursuant to paragraphs (k)(4) and (5) of this section or acquired from another party.

(1) *Maintenance of records and submittal of information relevant to compliance with fleet average CO₂ standards—*

(1) *Maintenance of records.* (i) Manufacturers producing any light-duty vehicles, light-duty trucks, or medium-duty passenger vehicles subject to the provisions in this subpart or any heavy-duty vehicles subject to the standards of 40 CFR 1037.104 must establish, maintain, and retain all the following information in adequately organized records for each model year:

(A) Model year.

(B) Applicable fleet average CO₂ standards for each averaging set as defined in paragraph (i) of this section.

(C) The calculated fleet average CO₂ value for each averaging set as defined in paragraph (i) of this section.

(D) All values used in calculating the fleet average CO₂ values.

(ii) Manufacturers producing any passenger automobiles or light trucks subject to the provisions in this subpart and vehicles subject to the standards of 40 CFR 1037.104 must establish, maintain, and retain all the following information in adequately organized records for each passenger automobile or light truck subject to this subpart:

(A) Model year.

(B) Applicable fleet average CO₂ standard.

(C) EPA test group.

(D) Assembly plant.

(E) Vehicle identification number.

(F) Carbon-related exhaust emission standard, N₂O emission standard, and CH₄ emission standard to which the passenger automobile or light truck is certified.

(G) In-use carbon-related exhaust emission standard.

(H) Information on the point of first sale, including the purchaser, city, and state.

(iii) Manufacturers must retain all required records for a period of eight years from the due date for the annual report. Records may be stored in any format and on any media, as long as manufacturers can promptly send EPA organized written records in English if requested by the Administrator. Manufacturers must keep records readily available as EPA may review them at any time.

(iv) The Administrator may require the manufacturer to retain additional records or submit information not specifically required by this section.

(v) Pursuant to a request made by the Administrator, the manufacturer must submit to the Administrator the information that the manufacturer is required to retain.

(vi) EPA may void ab initio a certificate of conformity for vehicles certified to emission standards as set forth or otherwise referenced in this subpart for which the manufacturer fails to retain the records required in this section or to provide such information to the Administrator upon request, or to submit the reports required in this section in the specified time period.

(2) *Reporting.* (i) Each manufacturer must submit an annual report. The annual report must contain for each applicable CO₂ standard, the calculated fleet average CO₂ value, all values required to calculate the CO₂ emissions value, the number of credits generated or debits incurred, all the values required to calculate the credits or debits, and the resulting balance of credits or debits. For each applicable alternative N₂O and/or CH₄ standard selected under the provisions of § 86.1818-12(f)(3), the report must contain the N₂O and/or CH₄ CO₂-equivalent debits calculated according to § 86.1818-12(f)(4) for each test group and all values required to calculate the number of debits incurred.

(ii) For each applicable fleet average CO₂ standard, the annual report must also include documentation on all credit transactions the manufacturer has engaged in since those included in the last report. Information for each transaction must include all of the following:

(A) Name of credit provider.

(B) Name of credit recipient.

(C) Date the trade occurred.

(D) Quantity of credits traded in megagrams.

(E) Model year in which the credits were earned.

(iii) Manufacturers calculating air conditioning leakage and/or efficiency credits under paragraph § 86.1871-12(b) shall include the following information for each model year and separately for passenger automobiles and light trucks and for each air conditioning system used to generate credits:

(A) A description of the air conditioning system.

(B) The leakage credit value and all the information required to determine this value.

(C) The total credits earned for each averaging set, model year, and region, as applicable.

(iv) Manufacturers calculating advanced technology vehicle credits under paragraph § 86.1871-12(c) shall include the following information for each model year and separately for passenger automobiles and light trucks:

(A) The number of each model type of eligible vehicle sold.

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(B) The cumulative model year production of eligible vehicles starting with the 2009 model year.

(C) The carbon-related exhaust emission value by model type and model year.

(v) Manufacturers calculating off-cycle technology credits under paragraph §86.1871–12(d) shall include, for each model year and separately for passenger automobiles and light trucks, all test results and data required for calculating such credits.

(vi) Unless a manufacturer reports the data required by this section in the annual production report required under §86.1844–01(e) or the annual report required under §600.512–12 of this chapter, a manufacturer must submit an annual report for each model year after production ends for all affected vehicles produced by the manufacturer subject to the provisions of this subpart and no later than May 1 of the calendar year following the given model year. Annual reports must be submitted to: Director, Compliance and Innovative Strategies Division, U.S. Environmental Protection Agency, 2000 Traverwood, Ann Arbor, Michigan 48105.

(vii) Failure by a manufacturer to submit the annual report in the specified time period for all vehicles subject to the provisions in this section is a violation of section 203(a)(1) of the Clean Air Act (42 U.S.C. 7522 (a)(1)) for each applicable vehicle produced by that manufacturer.

(viii) If EPA or the manufacturer determines that a reporting error occurred on an annual report previously submitted to EPA, the manufacturer's credit or debit calculations will be recalculated. EPA may void erroneous credits, unless traded, and will adjust erroneous debits. In the case of traded erroneous credits, EPA must adjust the selling manufacturer's credit balance to reflect the sale of such credits and any resulting credit deficit.

(3) *Notice of opportunity for hearing.* Any voiding of the certificate under paragraph (1)(1)(vi) of this section will be made only after EPA has offered the affected manufacturer an opportunity for a hearing conducted in accordance with §86.614 and, if a manufacturer requests such a hearing, will be made

only after an initial decision by the Presiding Officer.

[75 FR 25691, May 7, 2010, as amended at 76 FR 19874, Apr. 8, 2011; 76 FR 39522, July 6, 2011; 76 FR 57379, Sept. 15, 2011; 77 FR 63163, Oct. 15, 2012; 78 FR 36388, June 17, 2013]

§ 86.1866–12 CO₂ credits for advanced technology vehicles.

(a) Electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles, as those terms are defined in §86.1803–01, that are certified and produced for U.S. sale, where “U.S.” means the states and territories of the United States, in the 2012 through 2025 model years may use a value of zero (0) grams/mile of CO₂ to represent the proportion of electric operation of a vehicle that is derived from electricity that is generated from sources that are not on-board the vehicle, as specified by this paragraph (a).

(1) Model years 2012 through 2016: The use of zero (0) grams/mile CO₂ is limited to the first 200,000 combined electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles produced for U.S. sale, where “U.S.” means the states and territories of the United States, in the 2012 through 2016 model years, except that a manufacturer that produces 25,000 or more such vehicles for U.S. sale in the 2012 model year shall be subject to a limitation on the use of zero (0) grams/mile CO₂ to the first 300,000 combined electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles produced and delivered for sale by a manufacturer in the 2012 through 2016 model years.

(2) Model years 2017 through 2021: For electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles produced for U.S. sale, where “U.S.” means the states and territories of the United States, in the 2017 through 2021 model years, such use of zero (0) grams/mile CO₂ is unrestricted.

(3) Model years 2022 through 2025: The use of zero (0) grams/mile CO₂ is limited to the first 200,000 combined electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles produced for U.S. sale by a manufacturer in the 2022 through 2025 model years, except that a manufacturer that produces for U.S. sale 300,000 or more such vehicles in the 2019 through 2021 model

years shall be subject to a limitation on the use of zero (0) grams/mile CO₂ to the first 600,000 combined electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles produced for U.S. sale by a manufacturer in the 2022 through 2025 model years. Vehicles produced for U.S. sale in excess of these limitations will account for greenhouse gas emissions according to § 600.113(n).

(b) For electric vehicles, plug-in hybrid electric vehicles, fuel cell vehicles, dedicated natural gas vehicles, and dual-fuel natural gas vehicles as those terms are defined in § 86.1803–01, that are certified and produced for U.S. sale in the 2017 through 2021 model years and that meet the additional specifications in this section, the manufacturer may use the production multipliers in this paragraph (b) when determining the manufacturer's fleet average carbon-related exhaust emissions under § 600.512 of this chapter. Full size pickup trucks eligible for and using a production multiplier are not eligible for the performance-based credits described in § 86.1870–12(b).

(1) The production multipliers, by model year, for electric vehicles and fuel cell vehicles are as follows:

Model year	Production multiplier
2017	2.0
2018	2.0
2019	2.0
2020	1.75
2021	1.5

(2)(i) The production multipliers, by model year, for plug-in hybrid electric vehicles, dedicated natural gas vehicles, and dual-fuel natural gas vehicles are as follows:

Model year	Production multiplier
2017	1.6
2018	1.6
2019	1.6
2020	1.45
2021	1.3

(ii) The minimum all-electric driving range that a plug-in hybrid electric vehicle must have in order to qualify for use of a production multiplier is 10.2 miles on its nominal storage capacity of electricity when operated on the highway fuel economy test cycle. Alternatively, a plug-in hybrid electric vehicle may qualify for use of a produc-

tion multiplier by having an equivalent all-electric driving range greater than or equal to 10.2 miles during its actual charge-depleting range as measured on the highway fuel economy test cycle and tested according to the requirements of SAE J1711, Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-In Hybrid Vehicles (incorporated by reference in § 86.1). The equivalent all-electric range of a PHEV is determined from the following formula:

$$EAER = R_{CDA} \times ((CO_{2CS} - CO_{2CD}/CO_{2CS}))$$

Where:

EAER = the equivalent all-electric range attributed to charge-depleting operation of a plug-in hybrid electric vehicle on the highway fuel economy test cycle.

R_{CDA} = The actual charge-depleting range determined according to SAE J1711, Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-In Hybrid Vehicles (incorporated by reference in § 86.1).

CO_{2CS} = The charge-sustaining CO₂ emissions in grams per mile on the highway fuel economy test determined according to SAE J1711, Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-In Hybrid Vehicles (incorporated by reference in § 86.1).

CO_{2CD} = The charge-depleting CO₂ emissions in grams per mile on the highway fuel economy test determined according to SAE J1711, Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-In Hybrid Vehicles (incorporated by reference in § 86.1).

(3) The actual production of qualifying vehicles may be multiplied by the applicable value according to the model year, and the result, rounded to the nearest whole number, may be used to represent the production of qualifying vehicles when calculating average carbon-related exhaust emissions under § 600.512 of this chapter.

[77 FR 63164, Oct. 15, 2012]

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§ 86.1867-12

§ 86.1867-12 CO₂ credits for reducing leakage of air conditioning refrigerant.

Manufacturers may generate credits applicable to the CO₂ fleet average program described in § 86.1865-12 by implementing specific air conditioning system technologies designed to reduce air conditioning refrigerant leakage over the useful life of their passenger automobiles and/or light trucks. Credits shall be calculated according to this section for each air conditioning system that the manufacturer is using to generate CO₂ credits. Manufacturers may also generate early air conditioning refrigerant leakage credits under this section for the 2009 through 2011 model years according to the provisions of § 86.1871-12(b).

(a) The manufacturer shall calculate an annual rate of refrigerant leakage from an air conditioning system in grams per year according to the procedures specified in SAE J2727 (incorporated by reference in § 86.1). In doing

so, the refrigerant permeation rates for hoses shall be determined using the procedures specified in SAE J2064 (incorporated by reference in § 86.1). The annual rate of refrigerant leakage from an air conditioning system shall be rounded to the nearest tenth of a gram per year. The procedures of SAE J2727 may be used to determine leakage rates for HFC-134a and HFO-1234yf; manufacturers should contact EPA regarding procedures for other refrigerants. The annual rate of refrigerant leakage from an air conditioning system shall be rounded to the nearest tenth of a gram per year.

(b) The CO₂-equivalent gram per mile leakage reduction used to calculate the total leakage credits generated by an air conditioning system shall be determined according to this paragraph (b), separately for passenger automobiles and light trucks, and rounded to the nearest tenth of a gram per mile:

(1) Passenger automobile leakage credit for an air conditioning system:

$$\text{Leakage Credit} = \text{MaxCredit} \times \left[1 - \left(\frac{\text{LeakScore}}{16.6} \right) \times \left(\frac{\text{GWP}_{\text{REF}}}{1430} \right) \right] - \text{HiLeakDis}$$

Where:

MaxCredit is 12.6 (grams CO₂-equivalent/mile) for air conditioning systems using HFC-134a, and 13.8 (grams CO₂-equivalent/mile) for air conditioning systems using a refrigerant with a lower global warming potential.

LeakScore means the annual refrigerant leakage rate determined according to the procedures in SAE J2727 (incorporated by reference in § 86.1), where the refrigerant permeation rates for hoses shall be determined using the procedures specified in SAE J2064 (incorporated by reference in § 86.1). If the calculated rate is less than 8.3 grams/year (or 4.1 grams/year for systems using only electric compressors), the rate for the purpose of

this formula shall be 8.3 grams/year (or 4.1 grams/year for systems using only electric compressors).

GWP_{REF} means the global warming potential of the refrigerant as indicated in paragraph (e) of this section or as otherwise determined by the Administrator;

HiLeakDis means the high leak disincentive, which is zero for model years 2012 through 2016, and for 2017 and later model years is determined using the following equation, except that if GWP_{REF} is greater than 150 or if the calculated result of the equation is less than zero, HiLeakDis shall be set equal to zero, or if the calculated result of the equation is greater than 1.8 g/mi, HiLeakDis shall be set to 1.8 g/mi:

$$\text{HiLeakDis} = 1.8 \times \left(\frac{(\text{LeakScore} - \text{LeakThreshold})}{3.3} \right)$$

Where,

LeakThreshold = 11.0 for air conditioning systems with a refrigerant capacity less than or equal to 733 grams; or

LeakThreshold = [Refrigerant Capacity × 0.015] for air conditioning systems with a refrigerant capacity greater than 733 grams, where RefrigerantCapacity is the maximum refrigerant capacity specified

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for the air conditioning system, in grams.

(2) Light truck leakage credit for an air conditioning system:

$$\text{Leakage Credit} = \text{MaxCredit} \times \left[1 - \left(\frac{\text{LeakScore}}{20.7} \right) \times \left(\frac{\text{GWP}_{\text{REF}}}{1430} \right) \right] - \text{HiLeakDis}$$

Where:

MaxCredit is 15.6 (grams CO₂-equivalent/mile) for air conditioning systems using HFC-134a, and 17.2 (grams CO₂-equivalent/mile) for air conditioning systems using a refrigerant with a lower global warming potential.

LeakScore means the annual refrigerant leakage rate determined according to the provisions of SAE J2727 (incorporated by reference in § 86.1), where the refrigerant permeation rates for hoses shall be determined using the procedures specified in SAE J2064 (incorporated by reference in § 86.1). If the calculated rate is less than 10.4 grams/year (or 5.2 grams/year for systems using only electric compressors), the rate for the purpose of this formula

shall be 10.4 grams/year (or 5.2 grams/year for systems using only electric compressors).

GWP_{REF} means the global warming potential of the refrigerant as indicated in paragraph (e) of this section or as otherwise determined by the Administrator;

HiLeakDis means the high leak disincentive, which is zero for model years 2012 through 2016, and for 2017 and later model years is determined using the following equation, except that if GWP_{REF} is greater than 150 or if the calculated result of the equation is less than zero, HiLeakDis shall be set equal to zero, or if the calculated result of the equation is greater than 2.1 g/mi, HiLeakDis shall be set to 2.1 g/mi:

$$\text{HiLeakDis} = 2.1 \times \left(\frac{(\text{LeakScore} - \text{LeakThreshold})}{3.3} \right)$$

Where:

LeakThreshold = 11.0 for air conditioning systems with a refrigerant capacity less than or equal to 733 grams; or

LeakThreshold = [Refrigerant Capacity × 0.015] for air conditioning systems with a refrigerant capacity greater than 733 grams, where RefrigerantCapacity is the maximum refrigerant capacity specified for the air conditioning system, in grams.

(c) The total leakage reduction credits generated by the air conditioning system shall be calculated separately for passenger automobiles and light trucks according to the following formula:

$$\text{Total Credits (Megagrams)} = (\text{Leakage} \times \text{Production} \times \text{VLM}) \div 1,000,000$$

Where:

Leakage = the CO₂-equivalent leakage credit value in grams per mile determined in paragraph (b)(1) or (b)(2) of this section, whichever is applicable.

Production = The total number of passenger automobiles or light trucks, whichever is applicable, produced with the air condi-

tioning system to which to the leakage credit value from paragraph (b)(1) or (b)(2) of this section applies.

VLM = vehicle lifetime miles, which for passenger automobiles shall be 195,264 and for light trucks shall be 225,865.

(d) The results of paragraph (c) of this section, rounded to the nearest whole number, shall be included in the manufacturer's credit/debit totals calculated in § 86.1865-12(k)(5).

(e) The following values for refrigerant global warming potential (GWP_{REF}), or alternative values as determined by the Administrator, shall be used in the calculations of this section. The Administrator will determine values for refrigerants not included in this paragraph (e) upon request by a manufacturer.

- (1) For HFC-134a, GWP_{REF} = 1430;
- (2) For HFC-152a, GWP_{REF} = 124;
- (3) For HFO-1234yf, GWP_{REF} = 4;
- (4) For CO₂, GWP_{REF} = 1.

[77 FR 63165, Oct. 15, 2012]

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§ 86.1868–12 CO₂ credits for improving the efficiency of air conditioning systems.

Manufacturers may generate credits applicable to the CO₂ fleet average program described in § 86.1865–12 by implementing specific air conditioning system technologies designed to reduce air conditioning-related CO₂ emissions over the useful life of their passenger automobiles and/or light trucks. Credits shall be calculated according to this section for each air conditioning system that the manufacturer is using to generate CO₂ credits. Manufacturers may also generate early air conditioning efficiency credits under this section for the 2009 through 2011 model years according to the provisions of § 86.1871–12(b). For model years 2012 and

2013 the manufacturer may determine air conditioning efficiency credits using the requirements in paragraphs (a) through (d) of this section. For model years 2014 through 2016 the eligibility requirements specified in either paragraph (e) or (f) of this section must be met before an air conditioning system is allowed to generate credits. For model years 2017 and later the eligibility requirements specified in paragraph (g) of this section must be met before an air conditioning system is allowed to generate credits.

(a)(1) 2012 through 2016 model year air conditioning efficiency credits are available for the following technologies in the gram per mile amounts indicated in the following table:

Air conditioning technology	Credit value (g/mi)
Reduced reheat, with externally-controlled, variable-displacement compressor (e.g. a compressor that controls displacement based on temperature setpoint and/or cooling demand of the air conditioning system control settings inside the passenger compartment).	1.7
Reduced reheat, with externally-controlled, fixed-displacement or pneumatic variable displacement compressor (e.g. a compressor that controls displacement based on conditions within, or internal to, the air conditioning system, such as head pressure, suction pressure, or evaporator outlet temperature).	1.1
Default to recirculated air with closed-loop control of the air supply (sensor feedback to control interior air quality) whenever the ambient temperature is 75°F or higher: Air conditioning systems that operated with closed-loop control of the air supply at different temperatures may receive credits by submitting an engineering analysis to the Administrator for approval.	1.7
Default to recirculated air with open-loop control air supply (no sensor feedback) whenever the ambient temperature is 75°F or higher. Air conditioning systems that operate with open-loop control of the air supply at different temperatures may receive credits by submitting an engineering analysis to the Administrator for approval.	1.1
Blower motor controls which limit wasted electrical energy (e.g. pulse width modulated power controller).	0.9
Internal heat exchanger (e.g. a device that transfers heat from the high-pressure, liquid-phase refrigerant entering the evaporator to the low-pressure, gas-phase refrigerant exiting the evaporator).	1.1
Improved condensers and/or evaporators with system analysis on the component(s) indicating a coefficient of performance improvement for the system of greater than 10% when compared to previous industry standard designs).	1.1
Oil separator. The manufacturer must submit an engineering analysis demonstrating the increased improvement of the system relative to the baseline design, where the baseline component for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model. The characteristics of the baseline component shall be compared to the new component to demonstrate the improvement.	0.6

(2) 2017 and later model year air conditioning efficiency credits are available for the following technologies in

the gram per mile amounts indicated for each vehicle category in the following table:

Air conditioning technology	Passenger automobiles (g/mi)	Light trucks (g/mi)
Reduced reheat, with externally-controlled, variable-displacement compressor (e.g. a compressor that controls displacement based on temperature setpoint and/or cooling demand of the air conditioning system control settings inside the passenger compartment).	1.5	2.2
Reduced reheat, with externally-controlled, fixed-displacement or pneumatic variable displacement compressor (e.g. a compressor that controls displacement based on conditions within, or internal to, the air conditioning system, such as head pressure, suction pressure, or evaporator outlet temperature).	1.0	1.4

Air conditioning technology	Passenger automobiles (g/mi)	Light trucks (g/mi)
Default to recirculated air with closed-loop control of the air supply (sensor feedback to control interior air quality) whenever the ambient temperature is 75°F or higher; Air conditioning systems that operated with closed-loop control of the air supply at different temperatures may receive credits by submitting an engineering analysis to the Administrator for approval.	1.5	2.2
Default to recirculated air with open-loop control air supply (no sensor feedback) whenever the ambient temperature is 75°F or higher. Air conditioning systems that operate with open-loop control of the air supply at different temperatures may receive credits by submitting an engineering analysis to the Administrator for approval.	1.0	1.4
Blower motor controls which limit wasted electrical energy (e.g. pulse width modulated power controller).	0.8	1.1
Internal heat exchanger (e.g. a device that transfers heat from the high-pressure, liquid-phase refrigerant entering the evaporator to the low-pressure, gas-phase refrigerant exiting the evaporator).	1.0	1.4
Improved condensers and/or evaporators with system analysis on the component(s) indicating a coefficient of performance improvement for the system of greater than 10% when compared to previous industry standard designs).	1.0	1.4
Oil separator. The manufacturer must submit an engineering analysis demonstrating the increased improvement of the system relative to the baseline design, where the baseline component for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model. The characteristics of the baseline component shall be compared to the new component to demonstrate the improvement.	0.5	0.7

(b) Air conditioning efficiency credits are determined on an air conditioning system basis. For each air conditioning system that is eligible for a credit based on the use of one or more of the items listed in paragraph (a) of this section, the total credit value is the sum of the gram per mile values for the appropriate model year listed in paragraph (a) of this section for each item that applies to the air conditioning system.

(1) In the 2012 through 2016 model years the total credit value for an air conditioning system for passenger automobiles or light trucks may not be greater than 5.7 grams per mile.

(2) In the 2017 and later model years the total credit value for an air conditioning system may not be greater than 5.0 grams per mile for any passenger automobile or 7.2 grams per mile for any light truck.

(c) The total efficiency credits generated by an air conditioning system shall be calculated separately for passenger automobiles and light trucks according to the following formula:

$$\text{Total Credits (Megagrams)} = (\text{Credit} \times \text{Production} \times \text{VLM}) \div 1,000,000$$

Where:

Credit = the CO₂ efficiency credit value in grams per mile determined in paragraph (b) or (e) of this section, whichever is applicable.

Production = The total number of passenger automobiles or light trucks, whichever is

applicable, produced with the air conditioning system to which the efficiency credit value from paragraph (b) of this section applies.

VLM = vehicle lifetime miles, which for passenger automobiles shall be 195,264 and for light trucks shall be 225,865.

(d) The results of paragraph (c) of this section, rounded to the nearest whole number, shall be included in the manufacturer's credit/debit totals calculated in § 86.1865–12(k)(5).

(e) For the 2014 through 2016 model years, manufacturers must validate air conditioning credits by using the Air Conditioning Idle Test Procedure according to the provisions of this paragraph (e) or, alternatively, by using the AC17 reporting requirements specified in paragraph (f) of this section. The Air Conditioning Idle Test Procedure is not applicable after the 2016 model year.

(1) For each air conditioning system selected by the manufacturer to generate air conditioning efficiency credits, the manufacturer shall perform the Air Conditioning Idle Test Procedure specified in § 86.165–12 of this part.

(2) Using good engineering judgment, the manufacturer must select the vehicle configuration to be tested that is expected to result in the greatest increased CO₂ emissions as a result of the operation of the air conditioning system for which efficiency credits are being sought. If the air conditioning system is being installed in passenger

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automobiles and light trucks, a separate determination of the quantity of credits for passenger automobiles and light trucks must be made, but only one test vehicle is required to represent the air conditioning system, provided it represents the worst-case impact of the system on CO₂ emissions.

(3) The manufacturer shall determine an idle test threshold (ITT) for the tested vehicle configuration. A comparison of this threshold value with the

CO₂ emissions increase recorded over the Air Conditioning Idle Test Procedure in § 86.165-12 determines the total credits that may be generated by an air conditioning system. The manufacturer may choose one of the following idle test threshold (ITT) values for an air conditioning system:

- (i) 14.9 grams per minute; or
- (ii) The value determined from the following equation, rounded to the nearest tenth of a gram per minute:

$$\text{Idle Test Threshold (ITT)} = 20.5 - (1.58 \times \text{Displacement})$$

Where:

Displacement = the engine displacement of the test vehicle, expressed in liters and rounded to the nearest one tenth of a liter.

(4)(i) If the CO₂ emissions value determined from the Idle Test Procedure in § 86.165-12 is less than or equal to the idle test threshold (ITT) determined in paragraph (e)(3) of this section, the total CO₂ efficiency credit value (Credit) for use in paragraph (c) of this section

shall be the applicable value determined in paragraph (b) of this section.

(ii) If the CO₂ emissions value determined from the Idle Test Procedure in § 86.165-12 is greater than the idle test threshold (ITT) determined in paragraph (e)(3) of this section, the total CO₂ efficiency credit value (Credit) for use in paragraph (c) of this section shall be determined using the following formula:

$$\text{Credit} = \text{TCV} \times \left[1 - \left(\frac{\text{ITP} - \text{ITT}}{6.4} \right) \right]$$

Where:

Credit = The CO₂ efficiency credit value (Credit) that must be used in paragraph (c) of this section to calculate the total credits (in Megagrams) of air conditioning efficiency credits;

TCV = The total CO₂ efficiency credit value determined according to paragraph (b) of this section; and

ITP = the increased CO₂ emissions determined from the Idle Test Procedure in § 86.165-14.

ITT = the idle test threshold determined in paragraph (e)(3) of this section and rounded to the nearest one tenth of a gram per minute:

(iii) Air conditioning systems that record an increased CO₂ emissions value on the Idle Test Procedure in § 86.165-14 that is greater than or equal to the idle test threshold (ITT) determined in paragraph (e)(3) of this section plus 6.4 grams per minute are not

eligible for an air conditioning efficiency credit.

(5) Air conditioning systems with compressors that are solely powered by electricity shall submit Air Conditioning Idle Test Procedure data to be eligible to generate credits in the 2014 and later model years, but such systems are not required to meet a specific threshold to be eligible to generate such credits, as long as the engine remains off for a period of at least 2 minutes during the air conditioning on portion of the Idle Test Procedure in § 86.165-12(d).

(f) *AC17 reporting requirements.* Manufacturers may use the provisions of this paragraph (f) as an alternative to the use of the Air Conditioning Idle Test to demonstrate eligibility to generate air conditioning efficiency credits for the 2014 through 2016 model

years. This paragraph (f) is required for the 2017 through 2019 model years.

(1) The manufacturer shall perform the AC17 test specified in 40 CFR 1066.845 on each unique air conditioning system design and vehicle platform combination for which the manufacturer intends to accrue air conditioning efficiency credits. The manufacturer must test at least one unique air conditioning system within each vehicle platform in a model year, unless all unique air conditioning systems within a vehicle platform have been previously tested. A unique air conditioning system design is a system with unique or substantially different component designs or types and/or system control strategies (e.g., fixed displacement vs. variable displacement compressors, orifice tube vs. thermostatic expansion valve, single vs. dual evaporator, etc.). In the first year of such testing, the tested vehicle configuration shall be the highest production vehicle configuration within each platform. In subsequent model years the manufacturer must test other unique air conditioning systems within the vehicle platform, proceeding from the highest production untested system until all unique air conditioning systems within the platform have been tested, or until the vehicle platform experiences a major redesign. Whenever a new unique air conditioning system is tested, the highest production configuration using that system shall be the vehicle selected for testing. Air conditioning system designs which have similar cooling capacity, component types, and control strategies, yet differ in terms of compressor pulley ratios or condenser or evaporator surface areas will not be considered to be unique system designs. The test results from one unique system design may represent all variants of that design. Manufacturers must use good engineering judgment to identify the unique air conditioning system designs which will require AC17 testing in subsequent model years. Results must be reported separately for all four phases (two phases with air conditioning off and two phases with air conditioning on) of the test to the Environmental Protection Agency, and the results of the calculations required

in 40 CFR 1066.845 must also be reported. In each subsequent model year additional air conditioning system designs, if such systems exist, within a vehicle platform that is generating air conditioning credits must be tested using the AC17 procedure. When all unique air conditioning system designs within a platform have been tested, no additional testing is required within that platform, and credits may be carried over to subsequent model years until there is a significant change in the platform design, at which point a new sequence of testing must be initiated. No more than one vehicle from each credit-generating platform is required to be tested in each model year.

(2) The manufacturer shall also report the following information for each vehicle tested: the vehicle class, model type, curb weight, engine displacement, transmission class and configuration, interior volume, climate control system type and characteristics, refrigerant used, compressor type, and evaporator/condenser characteristics.

(g) *AC17 validation testing and reporting requirements.* For the 2020 and later model years, manufacturers must validate air conditioning credits by using the AC17 Test Procedure according to the provisions of this paragraph (g).

(1) For each air conditioning system selected by the manufacturer to generate air conditioning efficiency credits, the manufacturer shall perform the AC17 Air Conditioning Efficiency Test Procedure specified in 40 CFR 1066.845, according to the requirements of this paragraph (g).

(2) Complete the following testing and calculations:

(i) Perform the AC17 test on a vehicle that incorporates the air conditioning system with the credit-generating technologies.

(ii) Perform the AC17 test on a vehicle which does not incorporate the credit-generating technologies. The tested vehicle must be similar to the vehicle tested under paragraph (g)(2)(i) of this section and selected using good engineering judgment. The tested vehicle may be from an earlier design generation. If the manufacturer cannot identify an appropriate vehicle to test under this paragraph (g)(2)(ii), they may submit an engineering analysis

that describes why an appropriate vehicle is not available or not appropriate, and includes data and information supporting specific credit values, using good engineering judgment.

(iii) Subtract the CO₂ emissions determined from testing under paragraph (g)(1)(i) of this section from the CO₂ emissions determined from testing under paragraph (g)(1)(ii) of this section and round to the nearest 0.1 grams/mile. If the result is less than or equal to zero, the air conditioning system is not eligible to generate credits. If the result is greater than or equal to the total of the gram per mile credits determined in paragraph (b) of this section, then the air conditioning system is eligible to generate the maximum allowable value determined in paragraph (b) of this section. If the result is greater than zero but less than the total of the gram per mile credits determined in paragraph (b) of this section, then the air conditioning system is eligible to generate credits in the amount determined by subtracting the CO₂ emissions determined from testing under paragraph (g)(1)(i) of this section from the CO₂ emissions determined from testing under paragraph (g)(1)(ii) of this section and rounding to the nearest 0.1 grams/mile.

(3) For the first model year for which an air conditioning system is expected to generate credits, the manufacturer must select for testing the projected highest-selling configuration within each combination of vehicle platform and unique air conditioning system. The manufacturer must test at least one unique air conditioning system within each vehicle platform in a model year, unless all unique air conditioning systems within a vehicle platform have been previously tested. A unique air conditioning system design is a system with unique or substantially different component designs or types and/or system control strategies (e.g., fixed-displacement vs. variable displacement compressors, orifice tube vs. thermostatic expansion valve, single vs. dual evaporator, etc.). In the first year of such testing, the tested vehicle configuration shall be the highest production vehicle configuration within each platform. In subsequent model years the manufacturer must test

other unique air conditioning systems within the vehicle platform, proceeding from the highest production untested system until all unique air conditioning systems within the platform have been tested, or until the vehicle platform experiences a major redesign. Whenever a new unique air conditioning system is tested, the highest production configuration using that system shall be the vehicle selected for testing. Credits may continue to be generated by the air conditioning system installed in a vehicle platform provided that:

(i) The air conditioning system components and/or control strategies do not change in any way that could be expected to cause a change in its efficiency;

(ii) The vehicle platform does not change in design such that the changes could be expected to cause a change in the efficiency of the air conditioning system; and

(iii) The manufacturer continues to test at least one unique air conditioning system within each platform using the air conditioning system, in each model year, until all unique air conditioning systems within each platform have been tested.

(4) Each air conditioning system must be tested and must meet the testing criteria in order to be allowed to generate credits. Credits may continue to be generated by an air conditioning system in subsequent model years if the manufacturer continues to test at least one unique air conditioning system within each platform on an annual basis, unless all systems have been previously tested, as long as the air conditioning system and vehicle platform do not change substantially.

(h) The following definitions apply to this section:

(1) *Reduced reheat, with externally-controlled, variable displacement compressor* means a system in which compressor displacement is controlled via an electronic signal, based on input from sensors (e.g., position or setpoint of interior temperature control, interior temperature, evaporator outlet air temperature, or refrigerant temperature) and air temperature at the outlet of the evaporator can be controlled to a level at 41°F, or higher.

(2) *Reduced reheat, with externally-controlled, fixed-displacement or pneumatic variable displacement compressor* means a system in which the output of either compressor is controlled by cycling the compressor clutch off-and-on via an electronic signal, based on input from sensors (e.g., position or setpoint of interior temperature control, interior temperature, evaporator outlet air temperature, or refrigerant temperature) and air temperature at the outlet of the evaporator can be controlled to a level at 41°F, or higher.

(3) *Default to recirculated air mode* means that the default position of the mechanism which controls the source of air supplied to the air conditioning system shall change from outside air to recirculated air when the operator or the automatic climate control system has engaged the air conditioning system (i.e., evaporator is removing heat), except under those conditions where dehumidification is required for visibility (i.e., defogger mode). In vehicles equipped with interior air quality sensors (e.g., humidity sensor, or carbon dioxide sensor), the controls may determine proper blend of air supply sources to maintain freshness of the cabin air and prevent fogging of windows while continuing to maximize the use of recirculated air. At any time, the vehicle operator may manually select the non-recirculated air setting during vehicle operation but the system must default to recirculated air mode on subsequent vehicle operations (i.e., next vehicle start). The climate control system may delay switching to recirculation mode until the interior air temperature is less than the outside air temperature, at which time the system must switch to recirculated air mode.

(4) *Blower motor controls which limit waste energy* means a method of controlling fan and blower speeds which does not use resistive elements to decrease the voltage supplied to the motor.

(5) *Improved condensers and/or evaporators* means that the coefficient of performance (COP) of air conditioning system using improved evaporator and condenser designs is 10 percent higher, as determined using the bench test procedures described in SAE J2765 "Pro-

cedure for Measuring System COP of a Mobile Air Conditioning System on a Test Bench," when compared to a system using standard, or prior model year, component designs (SAE J2765 is incorporated by reference in § 86.1). The manufacturer must submit an engineering analysis demonstrating the increased improvement of the system relative to the baseline design, where the baseline component(s) for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model. The dimensional characteristics (e.g., tube configuration/thickness/spacing, and fin density) of the baseline component(s) shall be compared to the new component(s) to demonstrate the improvement in coefficient of performance.

(6) *Oil separator* means a mechanism which removes at least 50 percent of the oil entrained in the oil/refrigerant mixture exiting the compressor and returns it to the compressor housing or compressor inlet, or a compressor design which does not rely on the circulation of an oil/refrigerant mixture for lubrication.

[77 FR 63166, Oct. 15, 2012, as amended at 79 FR 23736, Apr. 28, 2014]

§ 86.1869-12 CO₂ credits for off-cycle CO₂-reducing technologies.

(a) Manufacturers may generate credits for CO₂-reducing technologies where the CO₂ reduction benefit of the technology is not adequately captured on the Federal Test Procedure and/or the Highway Fuel Economy Test. These technologies must have a measurable, demonstrable, and verifiable real-world CO₂ reduction that occurs outside the conditions of the Federal Test Procedure and the Highway Fuel Economy Test. These optional credits are referred to as "off-cycle" credits. Off-cycle technologies used to generate emission credits are considered emission-related components subject to applicable requirements, and must be demonstrated to be effective for the full useful life of the vehicle. Unless the manufacturer demonstrates that the technology is not subject to in-use deterioration, the manufacturer must account for the deterioration in their analysis. Durability evaluations of off-

cycle technologies may occur at any time throughout a model year, provided that the results can be factored into the data provided in the model year report. Off-cycle credits may not be approved for crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes. Off-cycle credits may not be earned for technologies installed on a motor vehicle to attain compliance with any vehicle safety standard or any regulation set forth in Title 49 of the Code of Federal Regulations. The manufacturer must use one of the three options specified in this section to determine the CO₂ gram per mile credit applicable to an off-cycle technology. Note that the option provided in paragraph (b) of this section applies only to the 2014 and later model years.

The manufacturer should notify EPA in their pre-model year report of their intention to generate any credits under this section.

(b) *Credit available for certain off-cycle technologies.* The provisions of this paragraph (b) are applicable only to 2014 and later model year vehicles. EPA may request data, engineering analyses, or other information that supports a manufacturer's use of the credits in this paragraph (b).

(1) The manufacturer may generate a CO₂ gram/mile credit for certain technologies as specified in this paragraph (b)(1). Technology definitions are in paragraph (b)(4) of this section. Calculated credit values shall be rounded to the nearest 0.1 grams/mile.

(i) *Waste heat recovery.* The credit shall be calculated using the following formula, rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left(\frac{g}{mi} \right) = ELR \times 0.007$$

Where:

ELR = the electrical load reduction of the waste heat recovery system, in Watts, calculated as an average over 5-cycle testing.

(ii) *High efficiency exterior lights.* Credits may be accrued for high efficiency lighting as defined in paragraph (b)(4) of this section based on the lighting locations with such lighting installed. Credits for high efficiency lighting are the sum of the credits for the applicable lighting locations in the following table (rounded to the nearest 0.1 grams/mile), or, if all lighting locations in the table are equipped with high efficiency lighting, the total credit for high efficiency lighting shall be 1.0 grams/mile. Lighting components that result in credit levels less than those shown in

the following table are not eligible for credits.

Lighting Component	Credit (grams/mile)
Low beam	0.38
High beam	0.05
Parking/position	0.10
Turn signal, front	0.06
Side marker, front	0.06
Tail	0.10
Turn signal, rear	0.06
Side marker, rear	0.06
License plate	0.08

(iii) *Solar panels.* (A) Credits for solar panels used solely for charging the battery of an electric vehicle, plug-in hybrid electric vehicle, or hybrid electric vehicle shall be calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left(\frac{g}{mi} \right) = 0.04385 \times P_{\text{panel}}$$

Where:

P_{panel} is the is the rated power of the solar panel, in Watts, determined under the

standard test conditions of 1000 Watts per meter squared direct solar irradiance at a panel temperature of 25 degrees Celsius (± 2 degrees) with an air mass spectrum of 1.5 (AM1.5).

(B) Credits for solar panels used solely for active vehicle ventilation systems are those specified in paragraph (b)(1)(viii)(E).

(C) Credits for solar panels used both for active cabin ventilation and for charging the battery of an electric vehicle, plug-in hybrid electric vehicle, or hybrid electric vehicle shall be calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left(\frac{g}{mi} \right) = C_{vent} + 0.04385 \times (P_{panel} - P_{vent})$$

Where:

C_{vent} is the credit attributable to active cabin ventilation from paragraph (b)(1)(viii)(E) of this section;

P_{panel} is the is the rated power of the solar panel, in Watts, determined under the standard test conditions of 1000 Watts per meter squared direct solar irradiance at a panel temperature of 25 degrees Celsius (± 2 degrees) with an air mass spectrum of 1.5 (AM1.5); and

P_{vent} is the amount of power, in Watts, required to run the active cabin ventilation system.

(iv) *Active aerodynamic improvements.*

(A) The credit for active aerodynamic improvements for passenger automobiles shall be calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left(\frac{g}{mi} \right) = 19.36 \times CD_{reduced}$$

Where:

$CD_{reduced}$ is the percent reduction in the coefficient of drag (C_d), shown as a value from 0 to 1. The coefficient of drag shall be determined using good engineering judgment consistent with standard industry test methods and practices.

(B) The credit for active aerodynamic improvements for light trucks shall be calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left(\frac{g}{mi} \right) = 33.16 \times CD_{reduced}$$

Where:

$CD_{reduced}$ is the percent reduction in the coefficient of drag (C_d), shown as a value from 0 to 1. The coefficient of drag shall be determined using good engineering judgment consistent with standard industry test methods and practices.

(v) *Engine idle start-stop.*

(A) The passenger automobile credit for engine idle start-stop systems is 2.5 grams/mile, provided that the vehicle is equipped with an electric heater circulation system (or a technology that provides a similar function). For vehicles

not equipped with such systems the credit is 1.5 grams/mile.

(B) The light truck credit for engine idle start-stop systems is 4.4 grams/mile, provided that the vehicle is equipped with an electric heater circulation system (or a technology that provides a similar function). For vehicles not equipped with such systems the credit is 2.9 grams/mile.

(vi) *Active transmission warm-up.* Systems using a single heat-exchanging loop that serves both transmission and engine warm-up functions are eligible

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for the credits in either paragraph (b)(1)(vi) or (b)(1)(vii) of this section, but not both.

(A) The passenger automobile credit is 1.5 grams/mile.

(B) The light truck credit is 3.2 grams/mile.

(vii) *Active engine warm-up.* Systems using a single heat-exchanging loop that serves both transmission and engine warm-up functions are eligible for the credits in either paragraph (b)(1)(vi) or (b)(1)(vii) of this section, but not both.

(A) The passenger automobile credit is 1.5 grams/mile.

(B) The light truck credit is 3.2 grams/mile.

(viii) *Thermal control technologies.* The maximum credit allowed for thermal control technologies is limited to 3.0 g/mi for passenger automobiles and to 4.3 g/mi for light trucks.

(A) *Glass or glazing.* Glass or glazing credits are calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} = \left[Z \times \sum_{i=1}^n \frac{T_i \times G_i}{G} \right]$$

Where:

Credit = the total glass or glazing credits, in grams per mile rounded to the nearest 0.1 grams/mile. The credit may not exceed 2.9 g/mi for passenger automobiles or 3.9 g/mi for light trucks;

Z = 0.3 for passenger automobiles and 0.4 for light trucks;

G_i = the measured glass area of window *i*, in square meters and rounded to the nearest tenth;

G = the total glass area of the vehicle, in square meters and rounded to the nearest tenth;

T_i = the estimated temperature reduction for the glass area of window *i*, determined using the following formula:

$$T_i = 0.3987 \times (T_{ts_{base}} - T_{ts_{new}})$$

Where:

T_{ts_{new}} = the total solar transmittance of the glass, measured according to ISO 13837, "Safety glazing materials—Method for determination of solar transmittance" (incorporated by reference in § 86.1).

T_{ts_{base}} = 62 for the windshield, side-front, side-rear, rear-quarter, and backlite locations, and 40 for rooflite locations.

(B) *Active seat ventilation.* The passenger automobile credit is 1.0 grams/mile. The light truck credit is 1.3 grams/mile.

(C) *Solar reflective surface coating.* The passenger automobile credit is 0.4 grams/mile. The light truck credit is 0.5 grams/mile.

(D) *Passive cabin ventilation.* The passenger automobile credit is 1.7 grams/

mile. The light truck credit is 2.3 grams/mile.

(E) *Active cabin ventilation.* The passenger automobile credit is 2.1 grams/mile. The light truck credit is 2.8 grams/mile.

(2) The maximum allowable decrease in the manufacturer's combined passenger automobile and light truck fleet average CO₂ emissions attributable to use of the default credit values in paragraph (b)(1) of this section is 10 grams per mile. If the total of the CO₂ g/mi credit values from the paragraph (b)(1) of this section does not exceed 10 g/mi for any passenger automobile or light truck in a manufacturer's fleet, then the total off-cycle credits may be calculated according to paragraph (f) of this section. If the total of the CO₂ g/mi credit values from the table in paragraph (b)(1) of this section exceeds 10 g/mi for any passenger automobile or light truck in a manufacturer's fleet, then the gram per mile decrease for the combined passenger automobile and light truck fleet must be determined according to paragraph (b)(2)(i) of this section to determine whether the 10 g/mi limitation has been exceeded.

(i) Determine the gram per mile decrease for the combined passenger automobile and light truck fleet using the following formula:

$$\text{Decrease} = \frac{\text{Credits} \times 1,000,000}{[(\text{Prod}_C \times 195,264) + (\text{Prod}_T \times 225,865)]}$$

Where:

Credits = The total of passenger automobile and light truck credits, in Megagrams, determined according to paragraph (f) of this section and limited to those credits accrued by using the default gram per mile values in paragraph (b)(1) of this section.

Prod_C = The number of passenger automobiles produced by the manufacturer and delivered for sale in the U.S.

Prod_T = The number of light trucks produced by the manufacturer and delivered for sale in the U.S.

(ii) If the value determined in paragraph (b)(2)(i) of this section is greater than 10 grams per mile, the total credits, in Megagrams, that may be accrued by a manufacturer using the default gram per mile values in paragraph (b)(1) of this section shall be determined using the following formula:

$$\text{Credit (Megagrams)} = \frac{[10 \times ((\text{Prod}_C \times 195,264) + (\text{Prod}_T \times 225,865))]}{1},000,000$$

Where:

Prod_C = The number of passenger automobiles produced by the manufacturer and delivered for sale in the U.S.

Prod_T = The number of light trucks produced by the manufacturer and delivered for sale in the U.S.

(iii) If the value determined in paragraph (b)(2)(i) of this section is not greater than 10 grams per mile, then the credits that may be accrued by a manufacturer using the default gram per mile values in paragraph (b)(1) of this section do not exceed the allowable limit, and total credits may be determined for each category of vehicles according to paragraph (f) of this section.

(iv) If the value determined in paragraph (b)(2)(i) of this section is greater than 10 grams per mile, then the combined passenger automobile and light truck credits, in Megagrams, that may be accrued using the calculations in paragraph (f) of this section must not exceed the value determined in paragraph (b)(2)(ii) of this section. This limitation should generally be done by reducing the amount of credits attributable to the vehicle category that caused the limit to be exceeded such that the total value does not exceed the value determined in paragraph (b)(2)(ii) of this section.

(3) In lieu of using the default gram per mile values specified in paragraph

(b)(1) of this section for specific technologies, a manufacturer may determine an alternative value for any of the specified technologies. An alternative value must be determined using one of the methods specified in paragraph (c) or (d) of this section.

(4) Definitions for the purposes of this paragraph (b) are as follows:

(i) *Active aerodynamic improvements* means technologies that are automatically activated under certain conditions to improve aerodynamic efficiency (e.g., lowering of the coefficient of drag, or Cd), while preserving other vehicle attributes or functions.

(ii) *High efficiency exterior lighting* means a lighting technology that, when installed on the vehicle, is expected to reduce the total electrical demand of the exterior lighting system when compared to conventional lighting systems. To be eligible for this credit, the high efficiency lighting must be installed in one or more of the following lighting components: low beam, high beam, parking/position, front and rear turn signals, front and rear side markers, taillights, backup/reverse lights, and/or license plate lighting.

(iii) *Engine idle start-stop* means a technology which enables a vehicle to automatically turn off the engine when the vehicle comes to a rest and restarts the engine when the driver applies

pressure to the accelerator or releases the brake. Off-cycle engine start-stop credits will only be allowed for a vehicle if the Administrator has made a determination under the testing and calculation provisions in 40 CFR Part 600 that engine start-stop is the predominant operating mode for that vehicle.

(iv) *Solar panels* means the external installation of horizontally-oriented solar panels, with direct and unimpeded solar exposure to an overhead sun, on an electric vehicle, a plug-in hybrid electric vehicle, a fuel cell vehicle, or a hybrid electric vehicle, such that the solar energy is used to provide energy to the electric drive system of the vehicle by charging the battery or directly providing power to the electric motor or to essential vehicle systems (e.g., cabin heating or cooling/ventilation). The rated power of the solar panels used to determine the credit value must be determined under the standard test conditions of 1,000 W/m² direct solar irradiance at a panel temperature of 25 ±2°C with an air mass of 1.5 spectrum (AM1.5).

(v) *Active transmission warmup* means a system that uses waste heat from the vehicle to quickly warm the transmission fluid to an operating temperature range using a heat exchanger, increasing the overall transmission efficiency by reducing parasitic losses associated with the transmission fluid, such as losses related to friction and fluid viscosity.

(vi) *Active engine warmup* means a system that uses waste heat from the vehicle to warm up targeted parts of the engine so that it reduces engine friction losses and enables the closed-loop fuel control more quickly. It allows a faster transition from cold operation to warm operation, decreasing CO₂ emissions, and increasing fuel economy.

(vii) *Waste heat recovery* means a system that captures heat that would otherwise be lost through the engine, exhaust system, or the radiator or other sources and converting that heat to electrical energy that is used to meet the electrical requirements of the vehicle or used to augment the warming of other load reduction technologies (e.g., cabin warming, active engine or transmission warm-up technologies). The

amount of energy recovered is the average value over 5-cycle testing.

(viii) *Active seat ventilation* means a device which draws air, pushes or forces air, or otherwise transfers heat from the seating surface which is in contact with the seat occupant and exhausts it to a location away from the seat. At a minimum, the driver and front passenger seat must utilize this technology for a vehicle to be eligible for credit.

(ix) *Solar reflective surface coating* means a vehicle paint or other surface coating which reflects at least 65 percent of the impinging infrared solar energy, as determined using ASTM standards E903, E1918-06, or C1549-09 (incorporated by reference in § 86.1). The coating must be applied at a minimum to all of the approximately horizontal surfaces of the vehicle that border the passenger and luggage compartments of the vehicle, (e.g., the rear deck lid and the cabin roof).

(x) *Passive cabin ventilation* means ducts, devices, or methods which utilize convective airflow to move heated air from the cabin interior to the exterior of the vehicle.

(xi) *Active cabin ventilation* means devices which mechanically move heated air from the cabin interior to the exterior of the vehicle.

(xii) *Electric heater circulation system* means a system installed in a vehicle equipped with an engine idle start-stop system that continues to circulate heated air to the cabin when the engine is stopped during a stop-start event. This system must be calibrated to keep the engine off for a minimum of one minute when the external ambient temperature is 30°F and when cabin heating is enabled.

(c) *Technology demonstration using EPA 5-cycle methodology*. To demonstrate an off-cycle technology and to determine a CO₂ credit using the EPA 5-cycle methodology, the manufacturer shall determine the off-cycle city/highway combined carbon-related exhaust emissions benefit by using the EPA 5-cycle methodology described in 40 CFR Part 600. This method may not be used for technologies that include elements (e.g., driver-selectable systems) that require additional analyses, data collection, projections, or modeling, or

other assessments to determine a national average benefit of the technology. Testing shall be performed on a representative vehicle, selected using good engineering judgment, for each model type for which the credit is being demonstrated. The emission benefit of a technology is determined by testing both with and without the off-cycle technology operating. If a specific technology is not expected to change emissions on one of the five test procedures, the manufacturer may submit an engineering analysis to the EPA that demonstrates that the technology has no effect. If EPA concurs with the analysis, then multiple tests are not required using that test procedure; instead, only one of that test procedure shall be required—either with or without the technology installed and operating—and that single value will be used for all of the 5-cycle weighting calculations. Multiple off-cycle technologies may be demonstrated on a test vehicle. The manufacturer shall conduct the following steps and submit all test data to the EPA.

(1) Testing without the off-cycle technology installed and/or operating. Determine carbon-related exhaust emissions over the FTP, the HFET, the US06, the SC03, and the cold temperature FTP test procedures according to the test procedure provisions specified in 40 CFR part 600 subpart B and using the calculation procedures specified in § 600.113-12 of this chapter. Run each of these tests a minimum of three times without the off-cycle technology installed and operating and average the per phase (bag) results for each test procedure. Calculate the 5-cycle weighted city/highway combined carbon-related exhaust emissions from the averaged per phase results, where the 5-cycle city value is weighted 55% and the 5-cycle highway value is weighted 45%. The resulting combined city/highway value is the baseline 5-cycle carbon-related exhaust emission value for the vehicle.

(2) Testing with the off-cycle technology installed and/or operating. Determine carbon-related exhaust emissions over the US06, the SC03, and the cold temperature FTP test procedures according to the test procedure provisions specified in 40 CFR part 600 sub-

part B and using the calculation procedures specified in § 600.113-12 of this chapter. Run each of these tests a minimum of three times with the off-cycle technology installed and operating and average the per phase (bag) results for each test procedure. Calculate the 5-cycle weighted city/highway combined carbon-related exhaust emissions from the averaged per phase results, where the 5-cycle city value is weighted 55% and the 5-cycle highway value is weighted 45%. Use the averaged per phase results for the FTP and HFET determined in paragraph (c)(1) of this section for operation without the off-cycle technology in this calculation. The resulting combined city/highway value is the 5-cycle carbon-related exhaust emission value including the off-cycle benefit of the technology but excluding any benefit of the technology on the FTP and HFET.

(3) Subtract the combined city/highway value determined in paragraph (c)(1) of this section from the value determined in paragraph (c)(2) of this section and round to the nearest 0.1 grams/mile. The result is the off-cycle benefit of the technology or technologies being evaluated, subject to EPA approval.

(4) Submit all test values to EPA, and include an engineering analysis describing the technology and how it provides off-cycle emission benefits. EPA may request additional testing if we determine that additional testing would be likely to provide significantly greater confidence in the estimates of off-cycle technology benefits.

(d) *Technology demonstration using alternative EPA-approved methodology.* (1) This option may be used only with EPA approval, and the manufacturer must be able to justify to the Administrator why the 5-cycle option described in paragraph (c) of this section insufficiently characterizes the effectiveness of the off-cycle technology. In cases where the EPA 5-cycle methodology described in paragraph (c) of this section cannot adequately measure the emission reduction attributable to an off-cycle technology, the manufacturer may develop an alternative approach. Prior to a model year in which a manufacturer intends to seek these credits,

the manufacturer must submit a detailed analytical plan to EPA. The manufacturer may seek EPA input on the proposed methodology prior to conducting testing or analytical work, and EPA will provide input on the manufacturer's analytical plan. The alternative demonstration program must be approved in advance by the Administrator and should:

(i) Use modeling, on-road testing, on-road data collection, or other approved analytical or engineering methods;

(ii) Be robust, verifiable, and capable of demonstrating the real-world emissions benefit with strong statistical significance;

(iii) Result in a demonstration of baseline and controlled emissions over a wide range of driving conditions and number of vehicles such that issues of data uncertainty are minimized;

(iv) Result in data on a model type basis unless the manufacturer demonstrates that another basis is appropriate and adequate.

(2) *Notice and opportunity for public comment.* The Administrator will publish a notice of availability in the FEDERAL REGISTER notifying the public of a manufacturer's proposed alternative off-cycle credit calculation methodology. The notice will include details regarding the proposed methodology, but will not include any Confidential Business Information. The notice will include instructions on how to comment on the methodology. The Administrator will take public comments into consideration in the final determination, and will notify the public of the final determination. Credits may not be accrued using an approved methodology until the first model year for which the Administrator has issued a final approval.

(3) With respect to fuel consumption improvement values applicable to the determination of average fuel economy under 600.510-12(c)(3) for the 2017 and later model years, EPA will consult with the U.S. Department of Transportation, National Highway Traffic Safety Administration, prior to making a decision on a manufacturer's application submitted under the requirements of this paragraph (d).

(e) *Review and approval process for off-cycle credits.* (1) *Initial steps required.* (i)

A manufacturer requesting off-cycle credits under the provisions of paragraph (c) of this section must conduct the testing and/or simulation described in that paragraph.

(ii) A manufacturer requesting off-cycle credits under the provisions of paragraph (d) of this section must develop a methodology for demonstrating and determining the benefit of the off-cycle technology, and carry out any necessary testing and analysis required to support that methodology.

(iii) A manufacturer requesting off-cycle credits under paragraphs (b), (c), or (d) of this section must conduct testing and/or prepare engineering analyses that demonstrate the in-use durability of the technology for the full useful life of the vehicle.

(2) *Data and information requirements.* The manufacturer seeking off-cycle credits must submit an application for off-cycle credits determined under paragraphs (c) and (d) of this section. The application must contain the following:

(i) A detailed description of the off-cycle technology and how it functions to reduce CO₂ emissions under conditions not represented on the FTP and HFET.

(ii) A list of the vehicle model(s) which will be equipped with the technology.

(iii) A detailed description of the test vehicles selected and an engineering analysis that supports the selection of those vehicles for testing.

(iv) All testing and/or simulation data required under paragraph (c) or (d) of this section, as applicable, plus any other data the manufacturer has considered in the analysis.

(v) For credits under paragraph (d) of this section, a complete description of the methodology used to estimate the off-cycle benefit of the technology and all supporting data, including vehicle testing and in-use activity data.

(vi) An estimate of the off-cycle benefit by vehicle model and the fleetwide benefit based on projected sales of vehicle models equipped with the technology.

(vii) An engineering analysis and/or component durability testing data or

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whole vehicle testing data demonstrating the in-use durability of the off-cycle technology components.

(3) *EPA review of the off-cycle credit application.* Upon receipt of an application from a manufacturer, EPA will do the following:

(i) Review the application for completeness and notify the manufacturer within 30 days if additional information is required.

(ii) Review the data and information provided in the application to determine if the application supports the level of credits estimated by the manufacturer.

(iii) For credits under paragraph (d) of this section, EPA will make the application available to the public for comment, as described in paragraph (d)(2) of this section, within 60 days of receiving a complete application. The public review period will be specified as 30 days, during which time the public may submit comments. Manufacturers may submit a written rebuttal of comments for EPA consideration or may revise their application in response to comments. A revised application should be submitted after the end of the public review period, and EPA will review the application as if it was a new application submitted under this paragraph (e)(3).

(4) *EPA decision.* (i) For credits under paragraph (c) of this section, EPA will notify the manufacturer of its decision within 60 days of receiving a complete application.

(ii) For credits under paragraph (d) of this section, EPA will notify the manufacturer of its decision after reviewing and evaluating the public comments. EPA will make the decision and rationale available to the public.

(iii) EPA will notify the manufacturer in writing of its decision to approve or deny the application, and will provide the reasons for the decision. EPA will make the decision and rationale available to the public.

(f) *Calculation of total off-cycle credits.* Total off-cycle credits in Megagrams of CO₂ (rounded to the nearest whole number) shall be calculated separately for passenger automobiles and light trucks according to the following formula:

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$$\text{Total Credits (Megagrams)} = (\text{Credit} \times \text{Production} \times \text{VLM}) \div 1,000,000$$

Where:

Credit = the credit value in grams per mile determined in paragraph (d)(1), (d)(2) or (d)(3) of this section.

Production = The total number of passenger automobiles or light trucks, whichever is applicable, produced with the off-cycle technology to which the credit value determined in paragraph (b), (c), or (d) of this section applies.

VLM = vehicle lifetime miles, which for passenger automobiles shall be 195,264 and for light trucks shall be 225,865.

[77 FR 63170, Oct. 15, 2012]

§ 86.1870-12 CO₂ credits for qualifying full-size pickup trucks.

Full-size pickup trucks may be eligible for additional credits based on the implementation of hybrid technologies or on exhaust emission performance, as described in this section. Credits may be generated under either paragraph (a) or (b) of this section for a qualifying pickup truck, but not both.

(a) *Credits for implementation of hybrid electric technology.* Full size pickup trucks that implement hybrid electric technologies may be eligible for an additional credit under this paragraph (a). Pickup trucks earning the credits under this paragraph (a) may not earn the credits described in paragraph (b) of this section. To claim this credit the manufacturer must measure the recovered energy over the Federal Test Procedure according to § 600.116-12(c) to determine whether a vehicle is a mild or strong hybrid electric vehicle. To provide for EPA testing, the vehicle must be able to broadcast battery pack voltage via an on-board diagnostics parameter ID channel.

(1) Full size pickup trucks that are mild hybrid electric vehicles and that are produced in the 2017 through 2021 model years are eligible for a credit of 10 grams/mile. To receive this credit in a model year, the manufacturer must produce a quantity of mild hybrid electric full size pickup trucks such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full size pickup trucks, is not less than the amount specified in the table below for that model year.

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Model year	Required minimum percent of full size pickup trucks (percent)
2017	20
2018	30
2019	55
2020	70
2021	80

(2) Full size pickup trucks that are strong hybrid electric vehicles and that are produced in the 2017 through 2025 model years are eligible for a credit of 20 grams/mile. To receive this credit in a model year, the manufacturer must produce a quantity of strong hybrid electric full size pickup trucks such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full size pickup trucks, is not less than 10 percent in that model year.

(b) *Credits for emission reduction performance.* Full size pickup trucks that achieve carbon-related exhaust emission values below the applicable target value determined in § 86.1818-12(c)(3) may be eligible for an additional credit. For the purposes of this paragraph (b), carbon-related exhaust emission values may include any applicable air conditioning leakage and/or efficiency credits as determined in § 86.1867 and § 86.1868. Pickup trucks earning the credits under this paragraph (b) may not earn credits described in paragraph (a) of this section and may not earn credits based on the production multipliers described in § 86.1866-12(b).

(1) Full size pickup trucks that are produced in the 2017 through 2021 model years and that achieve carbon-related exhaust emissions less than or equal to the applicable target value determined in § 86.1818-12(c)(3) multiplied by 0.85 (rounded to the nearest gram/mile) and greater than the applicable target value determined in § 86.1818-12(c)(3) multiplied by 0.80 (rounded to the nearest gram/mile) in a model year are eligible for a credit of 10 grams/mile. A pickup truck that qualifies for this credit in a model year may claim this credit for subsequent model years through the 2021 model year if the carbon-related exhaust emissions of that pickup truck do not increase relative to the emissions in the model year in

which the pickup truck qualified for the credit. To qualify for this credit in a model year, the manufacturer must produce a quantity of full size pickup trucks that meet the initial emission eligibility requirements of this paragraph (b)(1) such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full size pickup trucks, is not less than the amount specified in the table below for that model year.

Model year	Required minimum percent of full size pickup truck (percent)
2017	15
2018	20
2019	28
2020	35
2021	40

(2) Full size pickup trucks that are produced in the 2017 through 2025 model years and that achieve carbon-related exhaust emissions less than or equal to the applicable target value determined in § 86.1818-12(c)(3) multiplied by 0.80 (rounded to the nearest gram/mile) in a model year are eligible for a credit of 20 grams/mile. A pickup truck that qualifies for this credit in a model year may claim this credit for a maximum of four subsequent model years (a total of five consecutive model years) if the carbon-related exhaust emissions of that pickup truck do not increase relative to the emissions in the model year in which the pickup truck first qualified for the credit. This credit may not be claimed in any model year after 2025. To qualify for this credit in a model year, the manufacturer must produce a quantity of full size pickup trucks that meet the emission requirements of this paragraph (b)(2) such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full size pickup trucks, is not less than 10 percent in that model year. A pickup truck that qualifies for this credit in a model year and is subject to a major redesign in a subsequent model year such that it qualifies for the credit in the model year of the redesign may be allowed to qualify for an additional five years (not to go beyond the 2025 model year) with the approval of the

Administrator. Use good engineering judgment to determine whether a pickup truck has been subject to a major redesign.

(c) *Calculation of total full size pickup truck credits.* Total credits in Megagrams of CO₂ (rounded to the nearest whole number) shall be calculated for qualifying full size pickup trucks according to the following formula:

$$\text{Total Credits (Megagrams)} = ((10 \times \text{Production}_{\text{MHEV}}) + (10 \times \text{Production}_{\text{T15}}) + (20 \times \text{Production}_{\text{SHEV}}) + (20 \times \text{Production}_{\text{T20}}]) \times 225,865 \div 1,000,000$$

Where:

$\text{Production}_{\text{MHEV}}$ = The total number of mild hybrid electric full size pickup trucks produced with a credit value of 10 grams per mile from paragraph (a)(1) of this section.

$\text{Production}_{\text{T15}}$ = The total number of full size pickup trucks produced with a performance-based credit value of 10 grams per mile from paragraph (b)(1) of this section.

$\text{Production}_{\text{SHEV}}$ = The total number of strong hybrid electric full size pickup trucks produced with a credit value of 20 grams per mile from paragraph (a)(2) of this section.

$\text{Production}_{\text{T20}}$ = The total number of full size pickup trucks produced with a performance-based credit value of 20 grams per mile from paragraph (b)(2) of this section.

[77 FR 63174, Oct. 15, 2012]

§ 86.1871-12 Optional early CO₂ credit programs.

Manufacturers may optionally generate CO₂ credits in the 2009 through 2011 model years for use in the 2012 and later model years subject to EPA approval and to the provisions of this section. Manufacturers may generate early fleet average credits, air conditioning leakage credits, air conditioning efficiency credits, early advanced technology credits, and early off-cycle technology credits. Manufacturers generating any credits under this section must submit an early credits report to the Administrator as required in this section. The terms “sales” and “sold” as used in this section shall mean vehicles produced for U.S. sale, where “U.S.” means the

states and territories of the United States.

(a) *Early fleet average CO₂ reduction credits.* Manufacturers may optionally generate credits for reductions in their fleet average CO₂ emissions achieved in the 2009 through 2011 model years. To generate early fleet average CO₂ reduction credits, manufacturers must select one of the four pathways described in paragraphs (a)(1) through (4) of this section. The manufacturer may select only one pathway, and that pathway must remain in effect for the 2009 through 2011 model years. Fleet average credits (or debits) must be calculated and reported to EPA for each model year under each selected pathway. Early credits are subject to five year carry-forward restrictions based on the model year in which the credits are generated.

(1) *Pathway 1.* To earn credits under this pathway, the manufacturer shall calculate an average carbon-related exhaust emission value to the nearest one gram per mile for the classes of motor vehicles identified in this paragraph (a)(1), and the results of such calculations will be reported to the Administrator for use in determining compliance with the applicable CO₂ early credit threshold values.

(i) An average carbon-related exhaust emission value calculation will be made for the combined LDV/LDT1 averaging set, where the terms LDV and LDT1 are as defined in § 86.1803.

(ii) An average carbon-related exhaust emission value calculation will be made for the combined LDT2/HLDT/MDPV averaging set, where the terms LDT2, HLDT, and MDPV are as defined in § 86.1803.

(iii) Average carbon-related exhaust emission values shall be determined according to the provisions of § 600.510-12 of this chapter, except that:

(A) [Reserved]

(B) The average carbon-related exhaust emissions for alcohol fueled model types shall be calculated according to the provisions of § 600.510-12(j)(2)(ii)(B) of this chapter, without the use of the 0.15 multiplicative factor.

(C) The average carbon-related exhaust emissions for natural gas fueled

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model types shall be calculated according to the provisions of § 600.510-12(j)(2)(iii)(B) of this chapter, without the use of the 0.15 multiplicative factor.

(D) The average carbon-related exhaust emissions for alcohol dual fueled model types shall be the value measured using gasoline or diesel fuel, as applicable, and shall be calculated according to the provisions of § 600.510-12(j)(2)(vi) of this chapter, without the use of the 0.15 multiplicative factor and with $F = 0$. For the 2010 and 2011 model years only, if the California Air Resources Board has approved a manufacturer's request to use a non-zero value of F , the manufacturer may use such an approved value.

(E) The average carbon-related exhaust emissions for natural gas dual fueled model types shall be the value measured using gasoline or diesel fuel, as applicable, and shall be calculated according to the provisions of § 600.510-12(j)(2)(vii) of this chapter, without the use of the 0.15 multiplicative factor and with $F = 0$. For the 2010 and 2011 model years only, if the California Air Resources Board has approved a manufacturer's request to use a non-zero value of F , the manufacturer may use such an approved value.

(F) Carbon-related exhaust emission values for electric, fuel cell, and plug-in hybrid electric model types shall be included in the fleet average determined under paragraph (a)(1) of this section only to the extent that such vehicles are not being used to generate early advanced technology vehicle credits under paragraph (c) of this section.

(iv) Fleet average CO₂ credit threshold values.

Model year	LDV/ LDT1	LDT2/ HLDT/ MDPV
2009	323	439
2010	301	420
2011	267	390

(v) Credits are earned on the last day of the model year. Manufacturers must calculate, for a given model year, the number of credits or debits it has generated according to the following equation, rounded to the nearest megagram:

$$\text{CO}_2 \text{ Credits or Debits (Mg)} = [(\text{CO}_2 \text{ Credit Threshold} - \text{Manufacturer's Sales Weighted Fleet Average CO}_2 \text{ Emissions}) \times (\text{Total Number of Vehicles Sold}) \times (\text{Vehicle Lifetime Miles})] \div 1,000,000$$

Where:

CO₂ Credit Threshold = the applicable credit threshold value for the model year and vehicle averaging set as determined by paragraph (a)(1)(iv) of this section;

Manufacturer's Sales Weighted Fleet Average CO₂ Emissions = average calculated according to paragraph (a)(1)(iii) of this section;

Total Number of Vehicles Sold = The number of vehicles domestically sold as defined in § 600.511-80 of this chapter; and

Vehicle Lifetime Miles is 195,264 for the LDV/LDT1 averaging set and 225,865 for the LDT2/HLDT/MDPV averaging set.

(vi) Deficits generated against the applicable CO₂ credit threshold values in paragraph (a)(1)(iv) of this section in any averaging set for any of the 2009-2011 model years must be offset using credits accumulated by any averaging set in any of the 2009-2011 model years before determining the number of credits that may be carried forward to the 2012. Deficit carry forward and credit banking provisions of § 86.1865-12 apply to early credits earned under this paragraph (a)(1), except that deficits may not be carried forward from any of the 2009-2011 model years into the 2012 model year, and credits earned in the 2009 model year may not be traded to other manufacturers.

(2) *Pathway 2.* To earn credits under this pathway, manufacturers shall calculate an average carbon-related exhaust emission value to the nearest one gram per mile for the classes of motor vehicles identified in paragraph (a)(1) of this section, and the results of such calculations will be reported to the Administrator for use in determining compliance with the applicable CO₂ early credit threshold values.

(i) Credits under this pathway shall be calculated according to the provisions of paragraph (a)(1) of this section, except credits may only be generated by vehicles sold in a model year in California and in states with a section 177 program in effect in that model year. For the purposes of this section, "section 177 program" means State regulations or other laws that apply to

vehicle emissions from any of the following categories of motor vehicles: Passenger automobiles, light-duty trucks up through 6,000 pounds GVWR, and medium-duty vehicles from 6,001 to 14,000 pounds GVWR, as these categories of motor vehicles are defined in the California Code of Regulations, Title 13, Division 3, Chapter 1, Article 1, Section 1900.

(ii) A deficit in any averaging set for any of the 2009-2011 model years must be offset using credits accumulated by any averaging set in any of the 2009-2011 model years before determining the number of credits that may be carried forward to the 2012 model year. Deficit carry forward and credit banking provisions of §86.1865-12 apply to early credits earned under this paragraph (a)(1), except that deficits may not be carried forward from any of the 2009-2011 model years into the 2012 model year, and credits earned in the 2009 model year may not be traded to other manufacturers.

(3) *Pathway 3.* Pathway 3 credits are those credits earned under Pathway 2 as described in paragraph (a)(2) of this section in California and in the section 177 states determined in paragraph (a)(2)(i) of this section, combined with additional credits earned in the set of states that does not include California and the section 177 states determined in paragraph (a)(2)(i) of this section and calculated according to this paragraph (a)(3).

(i) Manufacturers shall earn additional credits under Pathway 3 by calculating an average carbon-related exhaust emission value to the nearest one gram per mile for the classes of motor vehicles identified in this paragraph (a)(3). The results of such calculations will be reported to the Administrator for use in determining compliance with the applicable CO₂ early credit threshold values.

(ii) An average carbon-related exhaust emission value calculation will be made for the passenger automobile averaging set. The term "passenger automobile" shall have the meaning given by the Department of Transportation at 49 CFR 523.4 for the specific model year for which the calculation is being made.

(iii) An average carbon-related exhaust emission value calculation will be made for the light truck averaging set. The term "light truck" shall have the meaning given by the Department of Transportation at 49 CFR 523.5 for the specific model year for which the calculation is being made.

(iv) Average carbon-related exhaust emission values shall be determined according to the provisions of §600.510-12 of this chapter, except that:

(A) Vehicles sold in California and the section 177 states determined in paragraph (a)(2)(i) of this section shall not be included.

(B) The average carbon-related exhaust emissions for alcohol fueled model types shall be calculated according to the provisions of §600.510-12(j)(2)(ii)(B) of this chapter, without the use of the 0.15 multiplicative factor.

(C) The average carbon-related exhaust emissions for natural gas fueled model types shall be calculated according to the provisions of §600.510-12(j)(2)(iii)(B) of this chapter, without the use of the 0.15 multiplicative factor.

(D) The average carbon-related exhaust emissions for alcohol dual fueled model types shall be calculated according to the provisions of §600.510-12(j)(2)(vi) of this chapter, without the use of the 0.15 multiplicative factor and with $F = 0$.

(E) The average carbon-related exhaust emissions for natural gas dual fueled model types shall be calculated according to the provisions of §600.510-12(j)(2)(vii) of this chapter, without the use of the 0.15 multiplicative factor and with $F = 0$.

(F) Electric, fuel cell, and plug-in hybrid electric model type carbon-related exhaust emission values shall be included in the fleet average determined under paragraph (a)(1) of this section only to the extent that such vehicles are not being used to generate early advanced technology vehicle credits under paragraph (c) of this section.

(v) Pathway 3 fleet average CO₂ credit threshold values.

(A) For 2009 and 2010 model year passenger automobiles, the fleet average CO₂ credit threshold value is 323 grams/mile.

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(B) For 2009 model year light trucks the fleet average CO₂ credit threshold value is 381 grams/mile, or, if the manufacturer chose to optionally meet an alternative manufacturer-specific light truck fuel economy standard calculated under 49 CFR 533.5 for the 2009 model year, the gram per mile fleet average CO₂ credit threshold shall be the CO₂ value determined by dividing 8887 by that alternative manufacturer-specific fuel economy standard and rounding to the nearest whole gram per mile.

(C) For 2010 model year light trucks the fleet average CO₂ credit threshold value is 376 grams/mile, or, if the manufacturer chose to optionally meet an alternative manufacturer-specific light truck fuel economy standard calculated under 49 CFR 533.5 for the 2010 model year, the gram per mile fleet average CO₂ credit threshold shall be the CO₂ value determined by dividing 8887 by that alternative manufacturer-specific fuel economy standard and rounding to the nearest whole gram per mile.

(D) For 2011 model year passenger automobiles the fleet average CO₂ credit threshold value is the value determined by dividing 8887 by the manufacturer-specific passenger automobile fuel economy standard for the 2011 model year determined under 49 CFR 531.5 and rounding to the nearest whole gram per mile.

(E) For 2011 model year light trucks the fleet average CO₂ credit threshold value is the value determined by dividing 8887 by the manufacturer-specific light truck fuel economy standard for the 2011 model year determined under 49 CFR 533.5 and rounding to the nearest whole gram per mile.

(vi) Credits are earned on the last day of the model year. Manufacturers must calculate, for a given model year, the number of credits or debits it has generated according to the following equation, rounded to the nearest megagram:

$$\text{CO}_2 \text{ Credits or Debits (Mg)} = [(\text{CO}_2 \text{ Credit Threshold} - \text{Manufacturer's Sales Weighted Fleet Average CO}_2 \text{ Emissions}) \times (\text{Total Number of Vehicles Sold}) \times (\text{Vehicle Lifetime Miles})] \div 1,000,000$$

Where:

CO₂ Credit Threshold = the applicable credit threshold value for the model year and

vehicle averaging set as determined by paragraph (a)(3)(v) of this section.

Manufacturer's Sales Weighted Fleet Average CO₂ Emissions = average calculated according to paragraph (a)(3)(iv) of this section.

Total Number of Vehicles Sold = The number of vehicles domestically sold as defined in § 600.511 of this chapter except that vehicles sold in California and the section 177 states determined in paragraph (a)(2)(i) of this section shall not be included.

Vehicle Lifetime Miles is 195,264 for the LDV/LDT1 averaging set and 225,865 for the LDT2/HLDT/MDPV averaging set.

(vii) Deficits in any averaging set for any of the 2009–2011 model years must be offset using credits accumulated by any averaging set in any of the 2009–2011 model years before determining the number of credits that may be carried forward to the 2012. Deficit carry forward and credit banking provisions of § 86.1865-12 apply to early credits earned under this paragraph (a)(3), except that deficits may not be carried forward from any of the 2009–2011 model years into the 2012 model year, and credits earned in the 2009 model year may not be traded to other manufacturers.

(4) *Pathway 4.* Pathway 4 credits are those credits earned under Pathway 3 as described in paragraph (a)(3) of this section in the set of states that does not include California and the section 177 states determined in paragraph (a)(2)(i) of this section and calculated according to paragraph (a)(3) of this section. Credits may only be generated by vehicles sold in the set of states that does not include California and the section 177 states determined in paragraph (a)(2)(i) of this section.

(b) *Early air conditioning leakage and efficiency credits.* (1) Manufacturers may optionally generate air conditioning refrigerant leakage credits according to the provisions of § 86.1867 and/or air conditioning efficiency credits according to the provisions of § 86.1868 in model years 2009 through 2011. The early credits are subject to five year carry forward limits based on the model year in which the credits are generated. Credits must be tracked by model type and model year.

(2) Manufacturers must be participating in one of the early fleet average

credit pathways described in paragraphs (a)(1), (2), or (3) of this section in order to generate early air conditioning credits for vehicles sold in California and the section 177 states as determined in paragraph (a)(2)(i) of this section. Manufacturers that select Pathway 4 as described in paragraph (a)(4) of this section may not generate early air conditioning credits for vehicles sold in California and the section 177 states as determined in paragraph (a)(2)(i) of this section. Manufacturers not participating in one of the early fleet average credit pathways described in this section may generate early air conditioning credits only for vehicles sold in states other than in California and the section 177 states as determined in paragraph (a)(2)(i) of this section.

(c) *Early advanced technology vehicle incentive.* Vehicles eligible for this incentive are electric vehicles, fuel cell vehicles, and plug-in hybrid electric vehicles, as those terms are defined in § 86.1803-01. If a manufacturer chooses to not include electric vehicles, fuel cell vehicles, and plug-in hybrid electric vehicles in their fleet averages calculated under any of the early credit pathways described in paragraph (a) of this section, the manufacturer may generate early advanced technology vehicle credits pursuant to this paragraph (c).

(1) The manufacturer shall record the sales and carbon-related exhaust emission values of eligible vehicles by model type and model year for model years 2009 through 2011 and report these values to the Administrator under paragraph (e) of this section.

(2) Manufacturers may use the 2009 through 2011 eligible vehicles in their fleet average calculations starting with the 2012 model year, subject to a five-year carry-forward limitation.

(i) Eligible 2009 model year vehicles may be used in the calculation of a manufacturer's fleet average carbon-related exhaust emissions in the 2012 through 2014 model years.

(ii) Eligible 2010 model year vehicles may be used in the calculation of a manufacturer's fleet average carbon-related exhaust emissions in the 2012 through 2015 model years.

(iii) Eligible 2011 model year vehicles may be used in the calculation of a manufacturer's fleet average carbon-related exhaust emissions in the 2012 through 2016 model years.

(3)(i) To use the advanced technology vehicle incentive, the manufacturer will apply the 2009, 2010, and/or 2011 model type sales volumes and their model type emission levels to the manufacturer's fleet average calculation.

(ii) The early advanced technology vehicle incentive must be used to offset a deficit in one of the 2012 through 2016 model years, as appropriate under paragraph (c)(2) of this section.

(iii) The advanced technology vehicle sales and emission values may be included in a fleet average calculation for passenger automobiles or light trucks, but may not be used to generate credits in the model year in which they are included or in the averaging set in which they are used. Use of early advanced technology vehicle credits is limited to offsetting a deficit that would otherwise be generated without the use of those credits. Manufacturers shall report the use of such credits in their model year report for the model year in which the credits are used.

(4) Manufacturers may use zero grams/mile to represent the carbon-related exhaust emission values for the electric operation of 2009 through 2011 model year electric vehicles, fuel cell vehicles, and plug-in hybrid electric vehicles subject to the limitations in § 86.1866. The 2009 through 2011 model year vehicles using zero grams per mile shall count against the 200,000 or 300,000 caps on use of this credit value, whichever is applicable under § 86.1866.

(d) *Early off-cycle technology credits.* Manufacturers may optionally generate credits for the implementation of certain CO₂-reducing technologies according to the provisions of § 86.1869 in model years 2009 through 2011. The early credits are subject to five year carry forward limits based on the model year in which the credits are generated. Credits must be tracked by model type and model year.

(e) *Early credit reporting requirements.* Each manufacturer shall submit a report to the Administrator, known as the early credits report, that reports

the credits earned in the 2009 through 2011 model years under this section.

(1) The report shall contain all information necessary for the calculation of the manufacturer's early credits in each of the 2009 through 2011 model years.

(2) The early credits report shall be in writing, signed by the authorized representative of the manufacturer and shall be submitted no later than 90 days after the end of the 2011 model year.

(3) Manufacturers using one of the optional early fleet average CO₂ reduction credit pathways described in paragraph (a) of this section shall report the following information separately for the appropriate averaging sets (e.g. LDV/LDT1 and LDT2/HLDT/MDPV averaging sets for pathways 1 and 2; LDV, LDT/2011 MDPV, LDV/LDT1 and LDT2/HLDT/MDPV averaging sets for Pathway 3; LDV and LDT/2011 MDPV averaging sets for Pathway 4):

(i) The pathway that they have selected (1, 2, 3, or 4).

(ii) A carbon-related exhaust emission value for each model type of the manufacturer's product line calculated according to paragraph (a) of this section.

(iii) The manufacturer's average carbon-related exhaust emission value calculated according to paragraph (a) of this section for the applicable averaging set and region and all data required to complete this calculation.

(iv) The credits earned for each averaging set, model year, and region, as applicable.

(4) Manufacturers calculating early air conditioning leakage and/or efficiency credits under paragraph (b) of this section shall report the following information for each model year separately for passenger automobiles and light trucks and for each air conditioning system used to generate credits:

(i) A description of the air conditioning system.

(ii) The leakage and efficiency credit values and all the information required to determine these values.

(iii) The total credits earned for each averaging set, model year, and region, as applicable.

(5) Manufacturers calculating early advanced technology vehicle credits under paragraph (c) of this section shall report, for each model year and separately for passenger automobiles and light trucks, the following information:

(i) The number of each model type of eligible vehicle produced.

(ii) The carbon-related exhaust emission value by model type and model year.

(6) Manufacturers calculating early off-cycle technology credits under paragraph (d) of this section shall report, for each model year and separately for passenger automobiles and light trucks, all test results and data required for calculating such credits.

[77 FR 63175, Oct. 15, 2012]

§§ 86.1931–86.1999 [Reserved]

APPENDIX I TO SUBPART S OF PART 86— VEHICLE PROCUREMENT METHODOLOGY

I. Test Sampling: The master owner list will be obtained from manufacturer records or owner registration lists. The list shall include all vehicle configurations of the target reality check test group within the selected mailing area. The mailing area shall be within a radius of at least 20 miles from the test site.

II. Selection Guidelines: The manufacturer or their representative shall make a reasonable effort to contact potential participants. Solicitation letters will be sent to potential participants in the order of their appearance on a randomized master owner list. The manufacturer or their representative shall perform the following steps:

(a) The manufacturer or their representative shall mail solicitation letters in batches. The size of each batch is at least five times the required number of vehicles to be tested for the group that year. First class mail shall be used.

(b) If the response rate is less than 20% after two to four weeks, the manufacturer or their representative shall make one more attempt and send a new solicitation package to the potential participants who have not yet responded.

(c) A telephone questionnaire will be conducted on a random selection of returned, positive-response postcards.

(d) If the required number of vehicles is not obtained, additional solicitation letters shall be sent to the next batch of potential participants in the order of their appearance on a randomized master owner list until the required number of vehicles are procured.

(e) Alternative selection methods may be used with advanced approval from the Administrator.

III. *Vehicles Not Available:* Vehicles may not be available or will not be pursued for procurement for the following reasons:

- (a) The potential participant response indicates “not willing to participate.”
- (b) The customer has moved out of the area.
- (c) The solicitation letter is undeliverable.
- (d) The customer did not respond after two attempts.
- (e) The vehicle is not in the appropriate mileage or age category.

APPENDIX II TO SUBPART S OF PART 86— AS-RECEIVED TESTING VEHICLE REJECTION CRITERIA

1. The odometer is inoperative, has been replaced, or the indicated mileage is outside the target range.
2. The emission system of the vehicle has been obviously tampered or the vehicle has been operated on leaded fuel. A manufacturer may request a vehicle be rejected because of the addition of an aftermarket security system if the manufacturer establishes that the installation would make that vehicle's emissions unrepresentative.
3. The vehicle has been used for severe duty (trailer towing for passenger cars, snow plowing, racing)
4. The vehicle has a history of extensive collision damage or major engine repair (piston, crank, cylinder head, engine block).
5. The vehicle exhibits ominous noises or serious fluid leaks from the engine or transmission, a modified exhaust system, (headers, side pipes, aftermarket catalysts, etc) or an exhaust system with an audible leak.
6. Testing the vehicle could endanger the safety of the vehicle, test facility, or individuals conducting the testing.
7. The MIL light is flashing (severe misfire indication).
8. Other items with prior agency approval.

APPENDIX III TO SUBPART S OF PART 86—AS-RECEIVED INSPECTION

Items to be recorded at time of Initial Inspection of Vehicle—

1. Date of Inspection
3. Test Group
4. Evaporative/refueling Family
5. Vehicle model
6. Odometer Reading
7. Build Date
8. MIL light on/off status
9. Readiness code status
10. Stored OBD codes
11. Any conditions referenced in appendix II to this subpart which result in vehicle being rejected from program.

Subpart T—Manufacturer-Run In-Use Testing Program for Heavy-Duty Diesel Engines

SOURCE: 70 FR 34619, June 14, 2005, unless otherwise noted.

§ 86.1901 What testing requirements apply to my engines that have gone into service?

(a) If you manufacture diesel heavy-duty engines above 8,500 lbs. GVWR that are subject to engine-based exhaust emission standards under this part, you must test them as described in this subpart. You must measure all emissions listed in § 86.1910(d) other than PM beginning in calendar year 2005 and you must measure PM emissions beginning in calendar year 2007. See § 86.1930 for special provisions that may apply to manufacturers in the early years of this program.

(b) We may void your certificate of conformity for an engine family if you do not meet your obligations under this subpart. We may also void individual tests and require you to retest those vehicles or take other appropriate measures in instances where you have not performed the testing in accordance with the requirements described in this subpart.

(c) In this subpart, the term “you” refers to the certificate-holder for any engines subject to the requirements of this subpart.

(d) In this subpart, *round* means to round numbers according to NIST Special Publication 811 (incorporated by reference in § 86.1).

[70 FR 34619, June 14, 2005, as amended at 75 FR 68459, Nov. 8, 2010]

§ 86.1905 How does this program work?

(a) You must test in-use engines from the families we select. We may select the following number of engine families for testing, except as specified in paragraph (b) of this section:

(1) We may select up to 25 percent of your engine families in any calendar year, calculated by dividing the number of engine families you certified in the model year corresponding to the calendar year by four and rounding to