

California Environmental Protection Agency
AIR RESOURCES BOARD

**CALIFORNIA 2015 AND SUBSEQUENT MODEL CRITERIA POLLUTANT EXHAUST
EMISSION STANDARDS AND TEST PROCEDURES AND 2017 AND SUBSEQUENT
MODEL GREENHOUSE GAS EXHAUST EMISSION STANDARDS AND TEST
PROCEDURES FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND
MEDIUM-DUTY VEHICLES**

Adopted: March 22, 2012
Amended: December 6, 2012
Amended: September 2, 2015

Note: The proposed amendments to this document are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions compared to the test procedures as amended December 6, 2012. [No change] indicates proposed federal provisions that are also proposed for incorporation herein without change. Existing intervening text that is not amended in this rulemaking is indicated by “* * * *”.

NOTE: This document is incorporated by reference in sections 1961.2(d), title 13, California Code of Regulations (CCR). It contains the majority of the requirements necessary for certification of a passenger car, light-duty truck, or medium-duty vehicle for sale in California, in addition to containing the exhaust emission standards and test procedures for these motor vehicles. However, reference is made in these test procedures to other ARB documents that contain additional requirements necessary to complete an application for certification. These other documents are designed to be used in conjunction with this document. They include:

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11. “California Non-Methane Organic Gas Test Procedures for 1993 through 2016 Model Year Vehicles,” (incorporated by reference in section 1961.2(d), title 13, CCR);

12. “California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles,” (incorporated by reference in section 1961.2(d), title 13, CCR);

123. “California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years,” (incorporated by reference in section 2317, title 13, CCR).

The section numbering conventions for this document are set forth in Part I, section A.3 on page A-2.

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**CALIFORNIA 2015 AND SUBSEQUENT MODEL CRITERIA POLLUTANT EXHAUST
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**PART I: GENERAL PROVISIONS FOR CERTIFICATION AND IN-USE
VERIFICATION OF EMISSIONS**

A. General Applicability

1. §86.1801 Applicability.

1.1 §86.1801-12. ~~October 15, 2012~~ February 19, 2015. Amend as follows:

* * * *

1.1.2 Subparagraph (b) Relationship to subpart A of this part. [n/a]

1.1.23 Subparagraph (bc) Clean alternative fuel ~~Aftermarket~~ conversions. [n/a]

* * * *

1.1.5 Subparagraph (e) You [n/a; ~~NLEVs.~~]

1.1.6 Subparagraph (f) Vehicle [n/a; ~~Tier 2 phase in provisions~~ no change]

~~1.1.7 Subparagraph (g) [n/a; Tier 2 phase in provisions]~~

1.1.37 Amend subparagraph (eg) Complete and incomplete vehicles. ~~Optional~~
Applicability as follows:

(a) ~~Subparagraph (c)(1) [n/a]~~

(b) ~~Amend subparagraph (c)(2) as follows:~~ A manufacturer must certify any heavy-duty complete Otto-cycle vehicle or complete diesel vehicle of 14,000 pounds Gross Vehicle Weight Rating (GVWR) or less and any medium-duty passenger vehicle in accordance with the medium-duty chassis-standards of section E.1 of these test procedures. For the 2015 through 2021 model years, a manufacturer must certify all LEV II heavy-duty engines or vehicles of 14,000 pounds GVWR or less, excluding medium-duty passenger vehicles, to the medium-duty engine standards in title 13, CCR, section 1956.8 (c) or (h), as applicable. For the 2022 and subsequent model years, a manufacturer must certify any heavy-duty vehicle of 10,000 pounds GVWR or less, including incomplete Otto-cycle vehicles and incomplete heavy-duty diesel vehicles, in accordance with the LEV III medium-duty chassis-standards of section E.1 of these test procedures. A manufacturer must certify any heavy-duty engine and vehicle of 10,001-14,000 pounds GVWR to the medium-duty engine standards in title 13, CCR, section

1956.8 (c) or (h), as applicable. A manufacturer may request to certify LEV II heavy-duty complete diesel vehicles of 14,000 pounds GVWR or less and LEV III heavy-duty complete diesel vehicles of 10,001 - 14,000 pounds GVWR to the chassis-standards in section E.1 of these test procedures; heavy-duty engine or heavy-duty vehicle provisions of 40 CFR Part 86 subpart A do not apply to such a vehicle or engine. [No change.]

(c) ~~Subparagraph (c)(3) [No change.]~~

(d) ~~Subparagraph (c)(4) [n/a; aftermarket conversions]~~

(e) ~~Subparagraph (c)(5) [n/a]~~

* * * *

2. California Provisions.

2.1 References to “light-duty trucks” in 40 CFR Part 86 and in 40 CFR Part 1066 shall apply to both “light-duty trucks” and “medium-duty vehicles” in these procedures. References to “light-duty vehicles” shall apply to “passenger cars” in these procedures. References to dual fuel vehicles shall also mean bi-fuel vehicles.

* * * *

2.4 Regulations both herein, ~~and~~ in Title 40, CFR Part 86, Subparts B, C, and S, and in Title 40, CFR Part 1066 concerning Otto-cycle and diesel-cycle vehicles shall be applicable to ethanol-fueled vehicles, including dual fuel, bi-fuel and fuel-flexible vehicles, except where specifically noted otherwise.

* * * *

B. Definitions, Acronyms and Abbreviations

1. §86.1803 Definitions.

1.1 §86.1803-01. ~~October 15, 2012~~ February 19, 2015. [No change, except as otherwise noted below.]

2. California Definitions.

* * * *

“Battery electric vehicle” or “BEV” means any vehicle that operates solely by use of a battery or battery pack, or that is powered primarily through the use of an electric battery or battery pack but uses a flywheel or capacitor that stores energy produced by the electric motor or through regenerative braking to assist in vehicle operation.

* * * *

“Emergency Vehicle” means a motor vehicle manufactured primarily for use as an ambulance or combination ambulance-hearse or for use by the United States Government or a State or local government for law enforcement. For provisions related to defeat devices and other Auxiliary Emission Control Devices, emergency vehicle means a motor vehicle that is an ambulance or fire truck.

* * * *

“Federal Tier II emission Bin 3, ~~or~~ Bin 4, or Bin 8” means the federal Tier II emission Bin 3, ~~or~~ Bin 4, or Bin 8, set forth in 40 CFR §86.1811-04 (February 26, 2007).

“Federal Tier III emission Bin 85 or Bin 110” means the federal Tier III emission Bin 85 or Bin110, set forth in 40 CFR §86.1811-17 (April 28, 2014).

* * * *

“Highway Test Procedures” means the Federal Test Procedure as set forth in 40 CFR Part 600 Subpart B or 40 CFR §1066.840 ~~Part 86~~, as modified in Part II of these test procedures with the migration provisions of §600.111-08 introduction, except that emissions shall be measured using the Highway Driving Schedule as set forth in Part II, Section F.

* * * *

“Non-methane organic gas” (or “NMOG”) means the sum of non-oxygenated and oxygenated hydrocarbons contained in a gas sample as measured in accordance with the “California Non-Methane Organic Gas Test Procedures for 1993 through 2016 Model Year Vehicles;” or the “California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles,” as applicable.

* * * *

C. General Requirements for Certification

1. §86.1805 Useful Life.

* * * *

1.2 §86.1805-17. February 19, 2015. Amend as follows:

1.2.1 Amend subparagraph (a) as follows: The full useful life of passenger cars, light-duty trucks, and medium-duty vehicles certified to the LEV III standards in section E.1.1.2 and/or to the SFTP 150,000 mile standards in section E.1.2.2 shall be 15 years or 150,000 miles, whichever occurs first. The full useful life of passenger cars, light-duty trucks, and medium-duty vehicles certified to the LEV II standards in section E.1.1.1 shall be 10 years or 120,000 miles, whichever occurs first, except that the full useful life of passenger cars, light-duty trucks, and medium-duty vehicles certified to the optional LEV II 150,000 mile standards in section E.1.1.1 shall be 15 years or 150,000 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.

1.2.2 Amend subparagraph (b) as follows: Delete; Replace with: The full useful life of passenger cars, light-duty trucks, and medium-duty passenger vehicles certified to the greenhouse gas standards in section E.2.5 shall be 15 years or 150,000 miles, whichever occurs first.

1.2.3 Subparagraph (c) [No change to cold temperature CO requirements; cold temperature NMHC requirements do not apply.]

1.2.4 Subparagraph (d) [n/a]

1.2.5 Subparagraph (e) [n/a]

1.2.6 Subparagraph (f) [n/a]

2. §86.1806 On-Board Diagnostics.

2.1 §86.1806-05. Delete.

2.2 §86.1806-17. Delete.

2.23 California On-Board Diagnostic System Requirements.

All vehicles shall be subject to the provisions of section 1968, et seq., title 13, CCR, as applicable. No vehicle shall be certified unless the Executive Officer finds that the vehicle complies with the requirements of section 1968, et seq., title 13, CCR, as applicable.

3. §86.1807 Vehicle Labeling.

3.1 §86.1807-07~~1~~. ~~July 13, 2005~~ April 28, 2014. Amend as follows:

* * * *

3.1.9 Subparagraph (h): [n/a]

* * * *

4. §86.1808 Maintenance Instructions.

4.1 §86.1808-07~~1~~. ~~July 13, 2005~~ April 28, 2014. [No change.]

5. §86.1809 Prohibition of Defeat Devices.

5.1 §86-1809-12. ~~May 7, 2010~~ April 28, 2014. [No change.]

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

1. §86.1810-09. October 15, 2012. Amend §86.1810-09 as follows:

This section applies to model year 2015 and ~~2016 later light-duty vehicles~~ passenger cars, light-duty trucks, and medium-duty vehicles fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels. Multi-fueled vehicles (including bi-fueled, 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). This section also applies to hybrid electric vehicles. The standards of this subpart apply to both certification and in-use vehicles unless otherwise indicated.

1.1 Subparagraphs (a) through (d) [No change.]

1.2 Subparagraph (e) On-board diagnostics. Delete and replace with:

All passenger cars, light-duty trucks and medium-duty vehicles are subject to the on-board diagnostic system requirements in section 1968 et seq., title 13, CCR, as applicable.

1.3 Subparagraph (f) Altitude Requirements. [No change, except that 50°F standards shall only apply at low altitude conditions and requirements for compliance with cold temperature NMHC emission standards shall not apply.]

1.4 Subparagraph (g) [No change.]

1.5 Subparagraph (h) [Delete; see D.4.13 below.]

1.6 Subparagraph (i) **Supplemental FTP general provisions for California.** Amend as follows:~~[Delete; see D.2. below]~~

1.6.1 2.1.1 Delete subparagraphs (1) through (3) [The implementation schedules for SFTP are set forth in section E.2.4 of these test procedures.]

1.6.2 2.1.2 Delete subparagraph (4); replace with: The SFTP standards set forth in section E.1.2 of these test procedures apply to PCs, LDTs, and MDVs certified on alternative fuels. The standards also apply to the gasoline and diesel fuel operation of fuel-flexible PCs, LDTs, and MDVs, and dual-fuel PCs, LDTs, and MDVs.

1.6.3 2.1.3 Subparagraph (5) [No change.]

1.6.4 2.1.4 Delete subparagraph (6); replace with: **Air to Fuel Ratio Requirement.** With the exception of cold-start conditions, warm-up conditions and rapid-throttle motion conditions (“tip-in” or “tip-out” conditions), the air to fuel ratio shall not be richer at any time than, for a given engine operating condition (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters), the leanest air to fuel mixture required to obtain maximum torque (lean best torque), with a tolerance of six percent of the fuel consumption. The Executive Officer may approve a manufacturer's request for approval to use additional enrichment in subsequent testing if the manufacturer demonstrates that additional enrichment is needed to protect the vehicle, occupants, engine, or emission control hardware.

1.6.5 2.1.5 Delete subparagraph (7); replace with: **Single Roll Electric Dynamometer Requirement.** For all vehicles certified to the SFTP standards, a single-roll electric dynamometer or a dynamometer that produces equivalent results, as set forth in 40 CFR §86.108-00 or §1066.210, must be used for all types of emission testing to determine compliance with the applicable emission standards.

1.6.6 2.1.6 Delete subparagraph (8);

1.6.7 2.1.7 Subparagraphs (9) through (12) [No change.]

1.6.8 2.1.8 Subparagraph (13) [No change, except that references to Tier 2 and non-Tier 2 vehicles shall mean California LEV II and LEV III vehicles and references to NMHC+NO_x shall mean NMOG+NO_x.]

~~1.6.9 2.1.9~~ Subparagraph (14); references to Tier 2 and non-Tier 2 vehicles shall mean California LEV II and LEV III vehicles.

Add the following sentence: The above provisions shall not apply to vehicles powered by “lean-burn” engines or Diesel-cycle engines. A “lean-burn” engine is defined as an Otto-cycle engine designed to run at an ~~air-fuel~~ air to fuel ratio significantly greater than stoichiometry during the large majority of its operation.

1.7 Subparagraph (j) **Evaporative emissions general provisions.** [Delete. (The provisions of this section are contained the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, Heavy-Duty Vehicles and Motorcycles.”)]

1.8 Subparagraph (k) through (n) [Delete. (The provisions of these sections are contained the “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”)]

1.9 Subparagraph (o) [Delete. See D.4.13 below]

1.10 Subparagraph (p) Amend as follows: For gasoline and diesel-fueled LEV II and LEV III vehicles, manufacturers may measure non-methane hydrocarbons (NMHC) in lieu of NMOG. The adjustment factors that must be applied to the measured NMHC emission levels before comparing them with the applicable standards are as follows:

1.10.1 Compliance with the LEV II and LEV III exhaust standards in section E.1.1.1 and E.1.1.2, respectively.

For LEV II vehicles that are certified using the California Gasoline Fuel Specifications set forth in Part II section 100.3.1.1 or using the federal E0 certification gasoline in 40 CFR §86.113-04(a)(1), manufacturers must either (1) multiply NMHC measurements by an adjustment factor of 1.04 before comparing with the NMOG standard to determine compliance with the standard or (2) calculate the NMHC to NMOG adjustment factor in accordance with 40 CFR §1066.635, as modified by these test procedures, and multiply NMHC measurements by that calculated adjustment factor before comparing with the standard.

For LEV III vehicles and LEV II vehicles that are certified using the California Gasoline Fuel Specifications set forth in Part II, section 100.3.1.2 or using the federal E10 certification gasoline in 40 CFR §1065.710(b), manufacturers must either (1) multiply NMHC measurements by an adjustment factor of 1.10 before adding it to the measured NOx emissions and comparing with the NMOG+NOx standard in section E.1.1.2 or before comparing it to the NMOG standard in section E.1.1.1, as applicable, or (2) calculate the NMHC to NMOG adjustment factor in accordance with 40 CFR §1066.635, as modified by these test procedures, and multiply NMHC measurements by that calculated adjustment factor before comparing with the NMOG+NOx standard in section E.1.1.2 or before comparing it to the NMOG standard in section E.1.1.1, as applicable, to determine compliance with that standard.

For LEV III vehicles and LEV II vehicles that are certified using a gasoline fuel that contains an ethanol content greater than that allowed by the California Gasoline Fuel Specifications set forth in Part II, section 100.3.1.2 and less than or equal to 25 percent ethanol, the adjustment factor that must be used to demonstrate compliance with the NMOG+NOx standard in section E.1.1.2 or the NMOG standard in section E.1.1.1, as applicable, this paragraph is calculated using the following formula:

Adjustment factor = $1.0302 + 0.0071 \times \text{volume percent fuel ethanol}$
where the value for the “volume percent fuel ethanol” used in this formula is 15 if the gasoline contains 15 percent ethanol, the “volume percent fuel ethanol” used in this formula is 20 if the gasoline contains 20 percent ethanol, etc. Manufacturers must multiply NMHC measurements by this calculated adjustment factor before adding it to the measured NOx emissions and comparing with the NMOG+NOx standard in section E.1.1.2 or the NMOG standard in section E.1.1.1, as applicable, to determine compliance with that standard. Manufacturers may use other factors to adjust NMHC results to more 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~~Executive Officer.

1.10.2 Compliance with the LEV II and LEV III SFTP standards in section E.1.2 and the Highway NMOG+NOx standard in section E.1.6.

For LEV III vehicles and LEV II vehicles that are certified to the SFTP Exhaust Emission Standards in section E.1.2 and/or the Highway NMOG+NOx Standard in section E.1.6 manufacturers must multiply NMHC measurements by an adjustment factor of 1.03 before adding it to the measured NOx emissions and comparing with the NMOG+NOx standard to determine compliance with that standard. This adjustment factor is not dependent on the certification gasoline.

2. §86.1810-17. April 28, 2014. Amend §86.1810-17 as follows:

This section applies to model year 2017 and later passenger cars, light-duty trucks, and medium-duty vehicles fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels. Multi-fueled vehicles (including bi-fueled, 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). This section also applies to hybrid electric vehicles. The standards of this subpart apply to both certification and in-use vehicles unless otherwise indicated.

2.1 Subparagraphs (a) through (d) [No change.]

2.2 Subparagraph (e) On-board diagnostics. Delete and replace with:

All passenger cars, light-duty trucks and medium-duty vehicles are subject to the on-board diagnostic system requirements in section 1968 et seq., title 13, CCR, as applicable.

2.3 Subparagraph (f) Altitude Requirements. [No change, except that 50°F standards and SFTP standards shall only apply at low altitude conditions.]

2.4 Subparagraph (g) [No change to cold temperature CO requirements; cold temperature NMHC requirements do not apply.]

2.5 Subparagraph (h) [No change.]

2.6 Subparagraph (i) [n/a]

2.7 Supplemental FTP General Provisions for California.

This section D.2.7 applies to all 2017 and subsequent model test groups, except for those using carryover emissions test data from 2016 and prior model years, which are subject to the requirements in section D.1.6.

2.7.1 **Enrichment limits.** The nominal air to fuel ratio throughout the US06 cycle may not be richer than the leanest air to fuel mixture required for lean best torque, except as allowed under section D.2.7.2. Unless the Executive Officer approves otherwise in advance, lean best torque is the leanest air to 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 to fuel ratio for lean best torque divided by 1.04.

2.7.2 **Engine protection.** Auxiliary Emission Control Devices (AECD) may use commanded enrichment to protect the engine or emission control hardware but 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 to fuel ratios richer than the stoichiometric ratio, except for the following:

- a. 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 the stoichiometric ratio.
- b. Small changes in the target air to fuel ratio to optimize vehicle emissions or drivability. This may be called “closed-loop biasing.”
- c. Temporary enrichment in response to rapid throttle motion.
- d. Enrichment during cold-start and warm-up conditions.
- e. Temporary enrichment for running OBD checks to comply with 40 CFR §86.1806.

2.7.3 **A/C-on specific calibrations.** A/ C-on specific calibrations (e.g., air to 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. For AECDs involving commanded enrichment, these AECDs must not operate differently for A/C-on operation than for A/C-off operation, except as provided under section D.2.7.2. This includes both the sensor inputs for triggering enrichment and the degree of enrichment employed.

2.7.4 **“Lean-on-cruise” calibration strategies.** Manufacturers may use “lean-on-cruise” strategies subject to the following specifications:

- a. A “lean-on-cruise” strategy is defined as the use of an air to fuel ratio significantly leaner than the stoichiometric ratio during non-deceleration conditions at speeds above 40 mph.
- b. A “lean-on-cruise” strategy must not be employed during vehicle operation in normal driving conditions, including A/C usage, unless at least one of the following conditions is met: (i) Such strategies are substantially employed during the FTP, US06, or SC03 duty cycle. (ii) Such strategies are demonstrated not to significantly reduce vehicle emission control effectiveness over the operating conditions in which they are employed. (iii)

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

- c. A manufacturer that proposes to use a “lean-on-cruise” strategy, must describe in the application for certification the circumstances under which such a calibration would be used and the reasons for using it.

2.7.52 For gasoline ~~and diesel-fueled~~ LEV II and LEV III vehicles, manufacturers may measure non-methane hydrocarbons (NMHC) in lieu of NMOG. Manufacturers shall multiply NMHC measurements by an adjustment factor of 1.03 before adding it to the measured NOx emissions and comparing with the NMOG+NOx standard to determine compliance with that standard.

13.4 Measurement of Hydrocarbon Emissions.

~~13.4.1~~ Except as otherwise indicated in these test procedures, for vehicles fueled by gasoline, methanol, ethanol, natural gas, or liquefied petroleum gas and certified to the LEV II and LEV III standards, hydrocarbon emissions shall mean non-methane organic gases (NMOG) and shall be measured in accordance with the “California Non-Methane Organic Gas Test Procedures for 1993 through 2016 Model Year Vehicles;” or the “California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles;” as applicable.

~~13.4.2~~ For diesel vehicles, NMOG shall mean non-methane hydrocarbons and shall be measured in accordance with Part B (Determination of NMHC Emissions by Flame Ionization Detection) of the “California Non-Methane Organic Gas Test Procedures for 1993 through 2016 Model Year Vehicles;” or the “California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles;” as applicable.

~~13.4.3~~ For vehicles certifying to the SFTP standards set forth in section E.1.2 of these test procedures, hydrocarbon emissions shall be measured in accordance with Part B (Determination of NMHC Emissions by Flame Ionization Detection) of the “California Non-Methane Organic Gas Test Procedures for 1993 through 2016 Model Year Vehicles;” or the “California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles;” as applicable. For alcohol-fueled vehicles certifying to the standards in section E.1.2, “Non-Methane Hydrocarbons” shall mean “Organic Material Non-Methane Hydrocarbon Equivalent.”

E. California Exhaust Emission Standards.

Delete 40 CFR §§86.1811 through 86.1819.

Introduction. The following section E. contains the exhaust emission standards and phase-in requirements applicable to California passenger cars, light-duty trucks and medium-duty vehicles. A manufacturer must demonstrate compliance with the exhaust standards applicable to specific test groups, and with the composite phase-in requirements applicable to the manufacturer's entire fleet. For model years 2015 and 2016, a manufacturer shall demonstrate compliance with the requirements of sections E.2.5 and E.3.2 by demonstrating compliance with sections E.2.5 and E.3.2 of the “California 2001 through 2014 Model Criteria Pollutant Exhaust

Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles.”

For the 2015 through 2021 model years, a manufacturer has the option of certifying LEV II engines used in incomplete Otto-cycle and incomplete diesel medium-duty vehicles with a gross vehicle weight rating of greater than 8,500 lbs. GVW to the heavy-duty engine standards and test procedures set forth in title 13, CCR, sections 1956.8(c) and (h). All 2015 through 2021 model LEV II medium-duty vehicles with a gross vehicle weight rating of less than or equal to 8,500 lbs. GVW and all LEV III medium-duty vehicles with a gross vehicle weight rating of less than or equal to 10,000 lbs. GVW, including incomplete Otto-cycle medium-duty vehicles and medium-duty vehicles that use diesel cycle engines, must be certified to the chassis standards and test procedures set forth in this section E. For the 2022 and subsequent model years, a manufacturer has the option of certifying LEV III engines used in incomplete Otto-cycle and incomplete diesel medium-duty vehicles with a gross vehicle weight rating of greater than 10,000 lbs. GVW to the heavy-duty engine standards and test procedures set forth in title 13, CCR, sections 1956.8(c) and (h). All 2022~~0~~ and subsequent model medium-duty vehicles with a gross vehicle weight rating of less than or equal to 10,000 lbs. GVW, including incomplete Otto-cycle medium-duty vehicles and medium-duty vehicles that use diesel cycle engines, must be certified to the LEV III chassis standards and test procedures set forth in this section E.

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1. Exhaust Emission Standards.

1.1 FTP Exhaust Emission Standards for Light- and Medium-Duty Vehicles.

The exhaust emission standards set forth in this section refer to the exhaust emitted over the driving schedule set forth in title 40, CFR Part 86, Subparts B and C, except as amended in these test procedures.

* * * *

1.1.2 LEV III Exhaust Standards. The following standards are the maximum exhaust emissions for the full useful life from new 2015 and subsequent model year “LEV III” passenger cars, light-duty trucks, and medium-duty vehicles, including fuel-flexible, bi-fuel and dual fuel vehicles when operating on both of the fuels they are designed to use. Before the 2015 model year, a manufacturer that produces vehicles meeting these standards has the option of certifying the vehicles to the standards, in which case the vehicles will be treated as LEV III vehicles for purposes of the fleet-wide phase-in requirements. All medium-duty vehicles with a gross vehicle weight rating of less than or equal to 10,000 lbs. GVW, including incomplete Otto-cycle medium-duty vehicles and medium-duty vehicles that use diesel cycle engines, must be certified to the LEV III chassis standards and test procedures set forth in this section E.1.1.2 in 2020 and subsequent model years.

LEV III Exhaust Mass Emission Standards for New 2015 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles³						
Vehicle Type	Durability Vehicle Basis (mi)	Vehicle Emission Category ²	NMOG + Oxides of Nitrogen ⁴ (g/mi)	Carbon Monoxide (g/mi)	Formaldehyde (mg/mi)	Particulates ¹ (g/mi)
All PCs; LDTs 8500 lbs. GVWR or less; and MDPVs Vehicles in this category are tested at their loaded vehicle weight	150,000	LEV160	0.160	4.2	4	0.01
		ULEV125	0.125	2.1	4	0.01
		ULEV70	0.070	1.7	4	0.01
		ULEV50	0.050	1.7	4	0.01
		SULEV30	0.030	1.0	4	0.01
		SULEV20	0.020	1.0	4	0.01
MDVs 8501 - 10,000 lbs. GVWR, excluding MDPVs Vehicles in this category are tested at their adjusted loaded vehicle weight	150,000	LEV395 ^{5,6}	0.395	6.4	6	0.12
		ULEV340 ^{5,6}	0.340	6.4	6	0.06
		ULEV250	0.250	6.4	6	0.06
		ULEV200	0.200	4.2	6	0.06
		SULEV170	0.170	4.2	6	0.06
		SULEV150	0.150	3.2	6	0.06
MDVs 10,001-14,000 lbs. GVWR Vehicles in this category are tested at their adjusted loaded vehicle weight	150,000	LEV630 ^{5,6}	0.630	7.3	6	0.12
		ULEV570 ^{5,6}	0.570	7.3	6	0.06
		ULEV400	0.400	7.3	6	0.06
		ULEV270	0.270	4.2	6	0.06
		SULEV230	0.230	4.2	6	0.06
		SULEV200	0.200	3.7	6	0.06

¹ These standards shall apply only to vehicles not included in the phase-in of the particulate standards set forth in Section E.1.1.2.1.

² The numeric portion of the category name is the NMOG+NOx value in thousandths of grams per mile.

³ These standards apply at both low altitude and high altitude except as noted in footnote 4.

⁴ The LEV III NMOG+NOx 150,000-mile exhaust mass emission standards for passenger cars and light-duty trucks that apply at high-altitude conditions are: 0.160 g/mi for LEV160 and ULEV125; 0.105 g/mi for ULEV70; 0.070 g/mi for ULEV50; and 0.050 g/mi for SULEV30 and SULEV20.

⁵ These vehicle emission categories are only applicable for the 2015 through 2021 model years.

⁶ The following NOx standards also apply for certification testing with emission-data vehicles: 0.2 g/mi for LEV395 and ULEV340; 0.4 g/mi for LEV630 and ULEV570.

1.1.2.1 LEV III Particulate Standards.

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1.1.2.1.4 Alternative Phase-in Schedule for Particulate Standards.

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1.1.2.1.4.1 Alternative Phase-in Schedules for the 3 mg/mi Particulate Standard for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles. A manufacturer may use an alternative phase-in schedule to comply with the 3 mg/mi particulate standard phase-in requirements as long as: (1) the percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in the 2019 model year is greater than or equal to the highest percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in the 2016, 2017, and 2018 model years individually; (2) the percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in the 2020 model year is greater than or equal to the highest percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in the 2016, 2017, and 2018 model years individually; and (3) equivalent PM emission reductions are achieved by the 2021 model year from passenger cars, light-duty trucks, and medium-duty passenger vehicles. Model year emission reductions shall be calculated by multiplying the percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 5 for the 2017 model year, 4 for the 2018 model year, 3 for the 2019 model year, 2 for the 2020 model year, and 1 for the 2021 model year. The yearly results for PC+LDT+MDPV vehicles shall be summed together to determine a cumulative total for PC+LDT+MDPV vehicles. In the 2021 model year, the cumulative total must be equal to or greater than 490, and 100 percent of the manufacturer's passenger cars, light-duty trucks, and medium-duty passenger vehicles must be certified to the 3 mg/mi particulate standard, to be considered equivalent. A manufacturer may add vehicles introduced before the 2017 model year (e.g., the percent of vehicles introduced in 2016 would be multiplied by 5) to the cumulative total.

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1.2 Supplemental Federal Test Procedure ("SFTP") Exhaust Emission Standards for Light- and Medium-Duty Vehicles.

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1.2.2 150,000-mile SFTP Exhaust Emission Standards for Light- and Medium-Duty Vehicles.

1.2.2.1 SFTP NMOG+NO_x and CO Exhaust Emission Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles. Manufacturers shall certify 2015 and subsequent model year LEVs, ULEVs, and SULEVs in the PC, LDT, and MDPV classes to either the *SFTP NMOG+NO_x and CO Stand-Alone Exhaust Emission Standards* set forth in section E.1.2.2.1.1, or in

accordance with the *SFTP NMOG+NOx and CO Composite Exhaust Emission Standards and Fleet-Average Requirements* set forth in section E.1.2.2.1.2. A manufacturer may also certify 2014 model LEVs, ULEVs, or SULEVs in the PC, LDT, or MDPV classes to LEV III SFTP standards, in which case, the manufacturer shall be subject to the LEV III SFTP emission standards and requirements, including the sales-weighted fleet-average NMOG+NOx composite emission standard applicable to 2015 model vehicles if choosing to comply with the *SFTP NMOG+NOx and CO Composite Exhaust Emission Standards and Fleet-Average Requirements* set forth in subsection E.1.2.2.1.2. The manufacturer shall notify the Executive Officer of its selected emission standard type in the Application for Certification of the first test group certifying to SFTP NMOG+NOx and CO emission standards on a 150,000 mile durability basis. Once an emission standard type for NMOG+NOx and CO is selected for a fleet, and the Executive Officer is notified of such selection, the selection must be kept through the 2025 model year for the entire fleet, which includes LEV II vehicles if selecting to comply with section E.1.2.2.1.2. The manufacturer may not change its selection until the 2026 model year. Test groups not certifying to the 150,000-mile SFTP NMOG+NOx and CO emission standards pursuant to this section E.1.2.2 shall be subject to the 4,000-mile SFTP NMOG+NOx and CO emission standards set forth in section E.1.2.1.

1.2.2.1.1 SFTP NMOG+NOx and CO Exhaust Stand-Alone Emission Standards. The following standards are the maximum SFTP NMOG+NOx and CO exhaust emissions through full useful life from 2015 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs when operating on the same gaseous or liquid fuel they use for FTP certification. These standards only apply to 2015 through 2016 model year In the case of fuel-flexible vehicles ≤ 6,000 lbs. GVWR and 2015 through 2017 model year fuel-flexible vehicles > 6,000 lbs. GVWR when operating on , SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2. 2017 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles) ≤ 6,000 lbs. GVWR as well as 2018 and subsequent model year multi-fueled vehicles > 6,000 lbs. GVWR, including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles).

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1.2.2.1.2 SFTP NMOG+NOx and CO Composite Exhaust Emission Standards. For the 2015 and subsequent model years, a manufacturer must certify LEV II and LEV III LEVs, ULEVs, and SULEVs, such that the manufacturer's sales-weighted fleet-average NMOG+NOx composite emission value, does not exceed the applicable NMOG+NOx composite emission standard set forth in the following table. In addition, the CO composite emission value of any LEV III test group shall not exceed the CO composite emission standard set forth in the following table. SFTP compliance shall be demonstrated using the same gaseous or liquid fuel used for FTP certification. These standards only apply to 2015 through 2016 model year In the case of fuel-flexible vehicles ≤

6,000 lbs. GVWR and 2015 through 2017 model year fuel-flexible vehicles > 6,000 lbs. GVWR when operating on, ~~SFTP compliance shall be demonstrated using~~ the LEV III certification gasoline specified in Part II, Section A.100.3.1.2. 2017 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles) ≤ 6,000 lbs. GVWR as well as 2018 and subsequent model year multi-fueled vehicles > 6,000 lbs. GVWR, including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles).

For each test group subject to this subsection, manufacturers shall calculate a Composite Emission Value for NMOG+NO_x and, for LEV III test groups, a separate Composite Emission Value for CO, using the following equation:

$$\text{Composite Emission Value} = 0.28 \times \text{US06} + 0.37 \times \text{SC03} + 0.35 \times \text{FTP} \quad [\text{Eq. 1}]$$

where “US06” = the test group’s NMOG+NO_x or CO emission value, as applicable, determined through the US06 test;

“SC03” = the test group’s NMOG+NO_x or CO emission value, as applicable, determined through the SC03 test; and

“FTP” = the test group’s NMOG+NO_x or CO emission value, as applicable, determined through the FTP test.

If no vehicles in a test group have air conditioning units, the FTP cycle emission value can be used in place of the SC03 value in Equation 1. To determine compliance with the SFTP NMOG+NO_x composite emission standard applicable to the model year, manufacturers shall use a sales-weighted fleet average of the NMOG+NO_x composite emission values of every applicable test group. The sales-weighted fleet average shall be calculated using a combination of carry-over and new certification SFTP composite emission values (converted to NMOG+NO_x, as applicable). LEV II test groups will use their emission values in the fleet average calculation but will not be considered LEV III test groups. Compliance with the CO composite emission standard cannot be demonstrated through fleet averaging. The NMOG+NO_x sales-weighted fleet-average composite emission value for the fleet and the CO composite emission value for each test group shall not exceed:

$$\frac{\left[\sum_{i=1}^n (\text{number of vehicles in the test group})_i \times (\text{composite value of bin})_i \right]}{\sum_{i=1}^n (\text{number of vehicles in the test group})_i} \quad [\text{Eq. 2}]$$

where "n" = a manufacturer's total number of PC, LDT, and, if applicable, MDPV certification bins, in a given model year including carry-over certification bins, certifying to SFTP composite emission standards in that model year;

"number of vehicles in the test group" = the number of vehicles produced and delivered for sale in California in the certification test group; and

"Composite Value of Bin" = the numerical value selected by the manufacturer for the certification bin that serves as the emission standard for the vehicles in the test group with respect to all testing for test groups certifying to SFTP on a 150,000-mile durability basis, and the SFTP carry-over composite emission value, as described in footnote 2 of this table, for carry-over LEV II test groups. For each test group, the manufacturer shall report to the Executive Officer the composite value of bin and the number of vehicles within the test group.

⁶ *Calculation of Fleet Average Total NMOG+NOx Credits or Debits.* A manufacturer shall calculate the total NMOG+NOx credits or debits, as follows:

$$\begin{aligned} &[(\text{NMOG+NOx Composite Emission Standard}) - (\text{Manufacturer's Sales-Weighted Fleet-Average Composite Emission Value})] \\ &\times (\text{Total Number of Vehicles Produced and Delivered for Sale in California in the 0-8,500 lbs GVWR plus MDPVs classes, if applicable}) \end{aligned} \quad [\text{Eq. 3}]$$

A negative number constitutes total NMOG+NOx debits, and a positive number constitutes total NMOG+NOx credits accrued by the manufacturer for the given model year. Total NMOG+NOx credits earned in a given model year retain full value through the fifth model year after they are earned. At the beginning of the sixth model year, the total NMOG+NOx credits have no value. A manufacturer may trade credits with other manufacturers

A manufacturer shall equalize total NMOG+NOx debits within three model years after they have been incurred by earning NMOG+NOx credits in an amount equal to the total NMOG+NOx debits. If total NMOG+NOx debits are not equalized within the three model-year period, the manufacturer is subject to the Health and Safety Code section 43211 civil penalty applicable to a manufacturer which sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the total NMOG+NOx debits are not equalized by the end of the specified time period. For the purposes of Health and Safety Code section 43211, the number of vehicles not meeting the state board's emission standards is determined by dividing the NMOG+NOx debits for the model year by the NMOG+NOx composite emission standard in effect during the model year in which the debits were incurred.

⁷ *Calculating the CO composite emission value.* Composite emission values for CO shall be calculated in accordance with Equation 1 above. Unlike the NMOG+NOx composite emission standards, manufacturers ~~would~~ may not be able to meet ~~comply with the proposed~~ CO composite emission standard through fleet averaging: each individual test group must comply with the standard. Test groups certified to 4,000-mile SFTP emission standards and federally-certified test groups certifying in California in accordance with Section H subparagraph 1.4 are not subject to this CO emission standard.

1.2.2.2 SFTP PM Exhaust Emission Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles. The following standards are the maximum PM exhaust emissions through the full useful life from 2017 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs in the PC, LDT, and MDPV classes when operating on the same gaseous or liquid fuel they use for FTP certification. These standards only apply to 2015 through 2016 model year In the case of flex-fueled fuel-flexible vehicles ≤ 6,000 lbs. GVWR and 2015 through 2017 model year fuel-flexible vehicles > 6,000 lbs. GVWR when operating on SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2. 2017 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles) ≤ 6,000 lbs. GVWR and 2018 and subsequent model year multi-

fueled vehicles > 6,000 lbs. GVWR, including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles).

SFTP PM Exhaust Emission Standards for 2017 and Subsequent Model LEV III Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles¹					
<i>Vehicle Type</i>	<i>Test Weight</i>	<i>Mileage for Compliance</i>	<i>Test Cycle</i>	<i>PM² (mg/mi)</i>	
				<i><u>2018 and Prior Model Years</u></i>	<i><u>2019 and Subsequent Model Years</u></i>
All PCs and LDTs through 8,500 lbs GVWR; MDPVs LDTs 0-6,000 lbs GVWR	Loaded vehicle weight	150,000	US06	10	<u>6</u>
LDTs 6,001-8,500 lbs GVWR; MDPVs	Loaded vehicle weight	150,000	US06	20	

¹ All PCs, LDTs, and MDPVs certified to LEV III FTP PM emission standards in section E.1.1.2.1 on a 150,000-mile durability basis shall comply with the SFTP PM Exhaust Emission Standards in this table.

² Relaxed Interim Certification Standard. Manufacturers shall certify test groups to a relaxed interim certification standard of 10 mg/mi for 2018 and prior model years. However, all vehicles certifying to the LEV III PM standard, including those from carryover test groups, shall be subject to the 6 mg/mi US06 PM standard in 2019 and subsequent model years.

1.2.2.3 SFTP NMOG+NOx and CO Exhaust Emission Standards for Medium-Duty Vehicles. The following standards are the maximum NMOG+NOx and CO composite emission values for full useful life of 2016 and subsequent model-year medium-duty LEV III ULEVs and SULEVs from 8,501 through 14,000 pounds GVWR when operating on the same gaseous or liquid fuel they use for FTP certification. In the case of fuel-flexible vehicles certified to LEV III FTP standards prior to model year 2018, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2. 2018 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles), including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles). The following composite emission standards do not apply to MDPVs subject to the emission standards set forth in sections E.1.2.2.1 and E.1.2.2.2.

SFTP NMOG+NOx and CO Composite Exhaust Emission Standards for 2016 and Subsequent Model ULEVs and SULEVs in the Medium-Duty Vehicle Class						
<i>Vehicle Type</i>	<i>Mileage for Compliance</i>	<i>HP/GVWR²</i>	<i>Test Cycle^{3,4,5}</i>	<i>Vehicle Emission Category⁶</i>	<i>Composite Emission Standard¹ (g/mi)</i>	
					<i>NMOG + NOx</i>	<i>Carbon Monoxide</i>
MDVs 8,501 - 10,000 lbs GVWR	150,000	≤ 0.024	US06 Bag 2, SC03, FTP	ULEV	0.550	22.0
				SULEV	0.350	12.0
		> 0.024	Full US06, SC03, FTP	ULEV	0.800	22.0
				SULEV	0.450	12.0
MDVs 10,001-14,000 lbs GVWR	150,000	n/a	Hot 1435 UC (Hot 1435 LA92), SC03, FTP	ULEV	0.550	6.0
				SULEV	0.350	4.0

¹ Manufacturers shall use Equation 1 in subsection E.1.2.2.1.2 to calculate SFTP Composite Emission Values for each test group subject to the emission standards in this table. For MDVs 10,001-14,000 lbs. GVWR, the emission results from the UC test shall be used in place of results from the US06 test.

² *Power to Weight Ratio.* If all vehicles in a test group have a power to weight ratio at or below a threshold of 0.024, they may opt to run the US06 Bag 2 in lieu of the full US06 cycle. The cutoff is determined by using a ratio of the engine's maximum rated horsepower, as established by the engine manufacturer in the vehicle's Application for Certification, to the vehicle's GVWR in pounds and does not include any horsepower contributed by electric motors in the case of hybrid electric or plug-in hybrid electric vehicles. Manufacturers may opt to test to the full cycle regardless of the calculated ratio; in such case, manufacturers shall meet the emission standards applicable to vehicles with power-to-weight ratios greater than 0.024.

³ *Test Weight.* Medium-duty vehicles are tested at their adjusted loaded vehicle weight (average of curb weight and GVWR).

⁴ *Road Speed Fan.* Manufacturers have the option to use a road speed modulated fan as specified in §86.107–96(d)(1) or §1066.105, as applicable, instead of a fixed speed fan for MDV SFTP testing.

⁵ If a manufacturer provides an engineering evaluation for a test group showing that SC03 emissions will be equivalent to or lower than FTP emissions, the FTP emission value may be used in place of the SC03 emission value when determining the composite emission value for that test group.

⁶ *Vehicle Emission Categories.* For MDVs 8,501-10,000 lbs. GVWR certified prior to the 2018 model year, for each model year, the percentage of MDVs certified to an SFTP emission category set forth in this section E.1.2.2.3 shall be equal to or greater than the total percentage certified to the FTP ULEV250, ULEV200, SULEV170, and SULEV150 emission categories; of these vehicles, the percentage of MDVs certified to an SFTP SULEV emission category shall be equal to or greater than the total percentage certified to both the FTP SULEV170 and SULEV150 emission categories. For MDVs 10,001-14,000 lbs. GVWR, for each model year, the percentage of MDVs certified to an SFTP emission category set forth in this section E.1.2.2.3 shall be equal to or greater than the total percentage certified to the FTP ULEV400, ULEV270, SULEV230, and SULEV200 emission categories; of these vehicles, the percentage of MDVs certified to an SFTP SULEV emission category shall be equal to or greater than the total percentage certified to both the FTP SULEV230 and SULEV200 emission categories. 2018 and subsequent model year MDVs 8,501-10,000 lbs. GVWR certifying to the FTP ULEV250 and ULEV200 emission categories, including vehicles certifying with carryover data, shall comply with the SFTP ULEV standards set forth in this section E.1.2.2.3, and those certifying to FTP SULEV170 and SULEV150, including vehicles certifying with carryover data, shall comply with the SFTP SULEV standards set forth in this section E.1.2.2.3. 2018 and subsequent model year MDVs 10,001-14,000 lbs. GVWR certifying to FTP ULEV400 and ULEV270 emission categories, including vehicles certifying with carryover data, shall comply with the SFTP ULEV standards set forth in this section E.1.2.2.3, and those certifying to SULEV230 and SULEV200, including vehicles certifying with carryover data, shall comply with the SFTP SULEV standards set forth in this section E.1.2.2.3.

1.2.2.4 SFTP PM Exhaust Emission Standards for Medium-Duty Vehicles.

The following standards represent the maximum PM composite emission values for the full useful life of 2017 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs when operating on the same gaseous or liquid fuel they use for FTP certification. In the case of fuel-flexible vehicles certified to LEV III FTP standards prior to model year

2018, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2. 2018 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles), including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles). The following composite emission standards do not apply to MDPVs subject to the emission standards set forth in sections E.1.2.2.1 and E.1.2.2.2.

SFTP PM Exhaust Emission Standards for 2017 and Subsequent Model Medium-Duty Vehicles¹					
<i>Vehicle Type</i>	<i>Test Weight</i>	<i>Mileage for Compliance</i>	<i>Hp/GVWR²</i>	<i>Test Cycle^{3,4,5}</i>	<i>PM (mg/mi)</i>
MDVs 8,501-10,000 lbs GVWR	Adjusted loaded vehicle weight	150,000	≤ 0.024	US06 Bag 2	7
			>0.024	US06	10
MDVs 10,001-14,000 lbs GVWR	Adjusted loaded vehicle weight	150,000	n/a	Hot 1435 UC (Hot 1435 LA92)	7

¹ Except for MDPVs subject to the emission standards set forth in section E.1.2.2.2, MDVs certified to 150,000-mile FTP PM emission standards in section E.1.1.2 shall comply with the SFTP PM Exhaust Emission Standards in this table.

² *Power to Weight Ratio.* If all vehicles in a test group have a power to weight ratio at or below a threshold of 0.024, they may opt to run the US06 Bag 2 in lieu of the full US06 cycle. The cutoff is determined by using a ratio of the engine's horsepower to the vehicle's GVWR in pounds and does not include any horsepower contributed by electric motors in the case of hybrid electric or plug-in hybrid electric vehicles. Manufacturers may opt to test to the full cycle regardless of the calculated ratio; in such case, manufacturers shall meet the emission standards applicable to vehicles with power-to-weight ratios greater than 0.024.

³ *Road Speed Fan.* Manufacturers have the option to use a road speed modulated fan as specified in §86.107–96(d)(1) or §1066.105, as applicable, instead of a fixed speed fan for MDV SFTP testing.

⁴ Manufacturers shall use Equation 1 above to calculate SFTP Composite PM Emission Values for each test group subject to the emission standards in this table. For MDVs 8,501-10,000 lbs. GVWR certifying to the US06 Bag 2 PM emission standard, the emission results from the US06 Bag 2 test shall be used in place of results from the full US06 test. For MDVs 10,001-14,000 lbs. GVWR, the emission results from the UC test shall be used in place of results from the US06 test.

⁵ If a manufacturer provides an engineering evaluation for a test group demonstrating that SC03 PM emissions are equivalent to or lower than FTP PM emissions, the FTP PM emission value may be used in lieu of the SC03 PM emission value when determining the composite emission value for that test group.

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1.4 50°F Exhaust Emission Standards.

1.4.1 Standards for Vehicles Certified to the LEV II Standards.

All passenger cars, light-duty trucks, and medium-duty vehicles certified to the LEV II exhaust emission standards set forth in subparagraph E.1.1.1 must demonstrate compliance with the following 4,000-mile exhaust emission standards for NMOG and formaldehyde measured on the FTP (40 CFR, Part 86, Subpart B) conducted at a nominal test temperature of 50°F, as modified by Part II, Section ~~CD~~ of these test procedures. A

manufacturer may demonstrate compliance with the NMOG and HCHO certification standards contained in this subparagraph 1.4.1 by measuring NMHC exhaust emissions in accordance with section D.1.10, ~~subparagraph (p)~~ and section G.3.1.2, respectively, of these test procedures. Emissions of CO and NO_x measured at 50°F at 4,000 miles shall not exceed the standards set forth in section E.1.1.1 applicable to vehicles of the same emission category and vehicle type subject to a cold soak and emission test at 68° to 86°F. Natural gas and diesel-fueled vehicles are exempt from the 50°F test requirements.

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1.4.2 Standards for Vehicles Certified to the LEV III Standards.

All passenger cars, light-duty trucks, and medium-duty vehicles certified to the LEV III exhaust emission standards set forth in subparagraph E.1.1.2, other than natural gas and diesel fueled vehicles, must demonstrate compliance with the following 4,000-mile exhaust emission standards for NMOG+NO_x and formaldehyde measured on the FTP (40 CFR, Part 86, Subpart B) conducted at a nominal test temperature of 50°F, as modified by Part II, Section ~~CD~~ of these test procedures. A manufacturer may demonstrate compliance with the NMOG+NO_x and HCHO certification standards contained in this subparagraph 1.4.2 by measuring NMHC exhaust emissions in accordance with section D.1.10, ~~subparagraph (p)~~ and section G.3.1.2, respectively, of these test procedures. Emissions of CO measured at 50°F at 4,000 miles shall not exceed the standards set forth in section E.1.1.2 applicable to vehicles of the same emission category and vehicle type subject to a cold soak and emission test at 68° to 86°F.

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1.6 Highway NMOG + NO_x Standard.

The maximum emissions of NMOG+NO_x measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600 Subpart B or 40 CFR §1066.840 ~~600 Subpart B~~, which is are incorporated herein by reference, as modified in Part II of these test procedures with the migration provisions of §600.111-08 introduction) must not be greater than the applicable LEV III NMOG+NO_x standard set forth in section E.1.1.2. Both the sum of the NMOG+NO_x emissions and the HWFET standard must be rounded in accordance with ASTM E29-67 to the nearest 0.001 g/mi before being compared.

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1.10 NMOG Credit for Direct Ozone Reduction Technology.

A manufacturer that certifies vehicles equipped with direct ozone reduction technologies shall be eligible to receive NMOG credits that can be applied to the NMOG exhaust emissions of the vehicle when determining compliance with the standard. In order to receive credit, the manufacturer must submit the following information for each vehicle model for which it seeks credit, including, but not limited to:

- (a) a demonstration of the airflow rate through the direct ozone reduction device and the ozone-reducing efficiency of the device over the range of speeds encountered in the UC as set forth in Part II, Section E of these test procedures;
- (b) an evaluation of the durability of the device for the full useful life of the vehicle; and
- (c) a description of the on-board diagnostic strategy for monitoring the performance of the device in-use.

Using the above information, the Executive Officer shall determine the value of the NMOG credit based on the calculated change in the one-hour peak ozone level using an approved airshed model. This credit can only be used for determining compliance with the exhaust standards in section E.1.1.1 or E.1.1.2, as applicable.

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2. Emission Standards Phase-In Requirements for Manufacturers.

2.1 Fleet Average NMOG + NO_x Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.

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2.1.2 Calculation of Fleet Average NMOG + NO_x Value.

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2.1.2.2 NMOG+NO_x Contribution Factor for Off-vehicle Charge Capable HEVs. The HEV NMOG+NO_x contribution factor for light-duty off-vehicle charge capable hybrid electric vehicles is calculated as follows. For the purpose of applying this formula to light-duty off-vehicle charge capable hybrid electric vehicles that are certified to the LEV II standards set forth in section E.1.1.1, a LEV II LEV shall use the formula for LEV160, a LEV II ULEV shall use the formula for ULEV125, and a LEV II SULEV shall use the formula for SULEV30.

LEV160 HEV Contribution Factor = 0.160 - [(Zero-emission VMT Allowance) x 0.035]
 ULEV125 HEV Contribution Factor = 0.125 - [(Zero-emission VMT Allowance) x 0.055]
 ULEV70 HEV Contribution Factor = 0.070 - [(Zero-emission VMT Allowance) x 0.020]
 ULEV50 HEV Contribution Factor = 0.050 - [(Zero-emission VMT Allowance) x 0.020]
 SULEV30 HEV Contribution Factor = 0.030 - [(Zero-emission VMT Allowance) x 0.010]
 SULEV20 HEV Contribution Factor = 0.020 - [(Zero-emission VMT Allowance) x 0.020]

~~where~~ The Zero-emission VMT Allowance for 2015 through 2017 model year off-vehicle charge capable HEVs is determined in accordance with section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck

and Medium-Duty Vehicle Classes.” ~~and For the 2018 and subsequent model years, the Zero-emission VMT Allowance is equal to the sum of the Zero-Emission Vehicles Miles Traveled TZEVE Allowance and the Allowance for US06 Capability in section C.3.3 of the “California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” as applicable;~~ ~~except that for the purposes of this section E.2.1.2.2, the maximum allowable Zero-emission VMT Allowance that may be used in these equations is 1.0. This section E.2.1.2.2 shall only apply to off-vehicle charge capable HEVs certified to the LEV III standards set forth in section E.1.1.2.~~

2.1.3 Phase-in Requirements for Small Volume Manufacturers.

(a) In the 2015 through ~~2021~~2016 model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of 0.160 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.160 g/mi for LDTs from 3751-5750 lbs. LVW calculated in accordance with section E.2.1.2. In ~~2022 through 2024~~the 2017 through 2021 model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of 0.125 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.125 g/mi for LDTs from 3751 lbs. LVW - 8,500 lbs. GVW and MDPVs calculated in accordance with section E.2.1.2. In ~~2025~~ 2022 and subsequent model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of ~~0.0700.051~~ g/mi for PCs and LDTs from 0-3750 lbs. LVW or ~~0.0700.051~~ g/mi for LDTs from 3751 lbs. LVW - 8,500 lbs. GVW and MDPVs calculated in accordance with section E.2.1.2. For the 2015 through 2021 model years, a small volume manufacturer may certify its vehicles to the LEV II exhaust standards in section E.1.1.1. All vehicles certified by a small volume manufacturer for the 2022 and subsequent model years must meet the LEV III exhaust standards in section E.1.1.2.

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2.3 LEV III Phase-In Requirements for Medium-Duty Vehicles Other than Medium-Duty Passenger Vehicles.

2.3.1 ~~(a)~~ **Requirements for Manufacturers Other Than Small Volume Manufacturers.** A manufacturer of MDVs, other than a small volume manufacturer, shall certify its MDV fleet according to the following phase-in schedule:

Model Year	Vehicles Certified to Section E.1.1 ¹ (%)				Vehicles Certified to title 13 CCR Section 1956.8(c) or (h) (%)
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV170 or SULEV230	ULEV
2015	40	60	0	0	100
2016	20	60	20	0	100
2017	10	50	40	0	100
2018	0	40	50	10	100
2019	0	30	40	30	100
2020	0	20	30	50	100
2021	0	10	20	70	100
2022 +	0	0	10	90	100

¹ The LEV II LEV and LEV II ULEV, emission categories are only applicable for the 2015 through 2019 model years. The LEV III LEV395, LEV630, ULEV340, and ULEV570 emission categories are only applicable for the 2015 through 2021 model years.

2.3.2(b) Requirements for Small Volume Manufacturers. In the 2015 through 2017 model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV LEV II LEV standards or to the LEV III LEV395 or LEV III LEV630 standards, as applicable, in a quantity equivalent to 100% of its MDV fleet. In the 2018 through 2021 model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV LEV II ULEV standards or to the LEV III ULEV340 or LEV III ULEV570 standards, as applicable, in a quantity equivalent to 100% of its MDV fleet. In the 2022 and subsequent model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV LEV III ULEV250 or LEV III ULEV400 standards, as applicable, in a quantity equivalent to 100% of its MDV fleet. Engines certified to these MDV standards are not eligible for emissions averaging.

2.3.3 Alternate Phase-In Schedules for LEV III MDVs.

2.3.3.1 Alternate Phase-In Schedules for LEV III MDVs for All Manufacturers.

2.3.3.1.1 For the 2016 and subsequent model years, the fleet average non methane organic gas plus oxides of nitrogen exhaust mass emission values from the

medium-duty vehicles produced and delivered for sale in California each model year shall not exceed:

<u>FLEET AVERAGE NON-METHANE ORGANIC GAS PLUS OXIDES OF NITROGEN EXHAUST MASS EMISSION REQUIREMENTS FOR MEDIUM-DUTY VEHICLES (150,000 mile Durability Vehicle Basis)</u>		
<u>Model Year</u>	<u>Fleet Average NMOG + NO_x (g/mi)</u>	
	<u>MDVs 8,501 - 10,000 lbs. GVWR</u>	<u>MDVs 10,001-14,000 lbs. GVWR</u>
<u>2016</u>	<u>0.333</u>	<u>0.548</u>
<u>2017</u>	<u>0.310</u>	<u>0.508</u>
<u>2018</u>	<u>0.278</u>	<u>0.451</u>
<u>2019</u>	<u>0.253</u>	<u>0.400</u>
<u>2020</u>	<u>0.228</u>	<u>0.349</u>
<u>2021</u>	<u>0.203</u>	<u>0.298</u>
<u>2022+</u>	<u>0.178</u>	<u>0.247</u>

2.3.3.1.2 Each manufacturer's fleet average NMOG+NO_x value for the total number of MDVs 8,501 - 10,000 lbs. GVWR produced and delivered for sale in California shall be calculated as follows:

$$\begin{aligned}
 & \left(\sum [\text{Number of MDVs 8,501 - 10,000 lbs. GVWR in a test group excluding off-vehicle charge} \right. \\
 & \quad \left. \text{capable hybrid electric vehicles} \times \text{applicable emission standard}] + \right. \\
 & \quad \left. \sum [\text{Number of off-vehicle charge capable hybrid electric vehicles in a test group} \times \right. \\
 & \quad \quad \left. \text{HEV NMOG+NO}_x \text{ contribution factor}] \right) \div \\
 & \quad \text{Total Number of MDVs 8,501 - 10,000 lbs. GVWR Produced and Delivered for sale in} \\
 & \quad \text{California, Including ZEVs and HEVs}
 \end{aligned}$$

2.3.3.1.3 Each manufacturer's fleet average NMOG+NO_x value for the total number of MDVs 10,001-14,000 lbs. GVWR produced and delivered for sale in California shall be calculated as follows:

$$\begin{aligned}
 & \left(\sum [\text{Number of MDVs 10,001 - 14,000 lbs. GVWR in a test group excluding off-vehicle charge} \right. \\
 & \quad \left. \text{capable hybrid electric vehicles} \times \text{applicable emission standard}] + \right. \\
 & \quad \left. \sum [\text{Number of off-vehicle charge capable hybrid electric vehicles in a test group} \times \right. \\
 & \quad \quad \left. \text{HEV NMOG+NO}_x \text{ contribution factor}] \right) \div \\
 & \quad \text{Total Number of MDVs 10,001 - 14,000 lbs. GVWR Produced and Delivered for sale in} \\
 & \quad \text{California, Including ZEVs and HEVs}
 \end{aligned}$$

2.3.3.1.4 The applicable emission standards to be used in the above equations are as follows:

<u>Model Year</u>	<u>Emission Category</u>	<u>Emission Standard Value (g/mi)</u>
<u>2016 and subsequent model year federally-certified vehicles</u>	<u>All</u>	<u>Sum of the full useful life NMOG and NOx Federal Emission Standards or full useful life NMOG+NOx Federal Emission Standard to which Vehicle is Certified</u>
<u>2016 through 2019 model year vehicles certified to the “LEV II” standards in E.1.1.1</u>	<u>All</u>	<u>Sum of the full useful life NMOG and NOx LEV II Emission Standards to which Vehicle is Certified</u>
<u>2016 and subsequent model year vehicles certified to the “LEV III” standards in E.1.1.2</u>	<u>All</u>	<u>Full useful life NMOG+NOx LEV III Emission Standards to which Vehicle is Certified</u>

2.3.3.1.5 NMOG+NOx Contribution Factor for Off-vehicle Charge Capable HEVs. The HEV NMOG+NOx contribution factors for medium-duty off-vehicle charge capable hybrid electric vehicles are calculated as follows.

The Zero-emission VMT Allowance for 2016 and 2017 model year off-vehicle charge capable HEVs is determined in accordance with section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes.” For the 2018 and subsequent model years, the Zero-emission VMT Allowance is equal to the sum of the Zero-Emission Vehicles Miles Traveled TZEVE Allowance and the Allowance for US06 Capability in section C.3.3 of the “California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” as applicable. For the purposes of this section E.2.3.3.1.5, the maximum allowable Zero-emission VMT Allowance that may be used in these equations is 1.0.

2.3.3.1.5.1 NMOG+NOx Contribution Factor for Off-vehicle Charge Capable HEVs 8,501 - 10,000 lbs. GVWR. The HEV NMOG+NOx contribution factors for medium-duty off-vehicle charge capable hybrid electric vehicles 8,501 - 10,000 lbs. GVWR are calculated as follows.

For the purpose of applying this formula to medium-duty off-vehicle charge capable hybrid electric vehicles 8,501 - 10,000 lbs. GVWR that are certified to the LEV II standards set forth in section E.1.1.1, a LEV II LEV shall use the formula for LEV395, a LEV II ULEV shall use the formula for ULEV340, and a LEV II SULEV shall use the formula for ULEV200.

$\text{LEV395 HEV Contribution Factor} = 0.395 - [(\text{Zero-emission VMT Allowance}) \times 0.055]$
 $\text{ULEV340 HEV Contribution Factor} = 0.340 - [(\text{Zero-emission VMT Allowance}) \times 0.090]$
 $\text{ULEV250 HEV Contribution Factor} = 0.250 - [(\text{Zero-emission VMT Allowance}) \times 0.050]$
 $\text{ULEV200 HEV Contribution Factor} = 0.200 - [(\text{Zero-emission VMT Allowance}) \times 0.030]$
 $\text{SULEV170 HEV Contribution Factor} = 0.170 - [(\text{Zero-emission VMT Allowance}) \times 0.020]$
 $\text{SULEV150 HEV Contribution Factor} = 0.150 - [(\text{Zero-emission VMT Allowance}) \times 0.020]$

2.3.3.1.5.2 NMOG+NO_x Contribution Factor for Off-vehicle Charge Capable HEVs 10,001 - 14,000 lbs. GVWR. The HEV NMOG+NO_x contribution factors for medium-duty off-vehicle charge capable hybrid electric vehicles 10,001 - 14,000 lbs. GVWR are calculated as follows.

For the purpose of applying this formula to medium-duty off-vehicle charge capable hybrid electric vehicles 10,001 - 14,000 lbs. GVWR that are certified to the LEV II standards set forth in section E.1.1.1, a LEV II LEV shall use the formula for LEV630, a LEV II ULEV shall use the formula for ULEV570, and a LEV II SULEV shall use the formula as follows.

$\text{LEV II SULEV HEV Contribution Factor} = 0.327 - [(\text{Zero-emission VMT Allowance}) \times 0.057]$

$\text{LEV630 HEV Contribution Factor} = 0.630 - [(\text{Zero-emission VMT Allowance}) \times 0.060]$
 $\text{ULEV570 HEV Contribution Factor} = 0.570 - [(\text{Zero-emission VMT Allowance}) \times 0.170]$
 $\text{ULEV400 HEV Contribution Factor} = 0.400 - [(\text{Zero-emission VMT Allowance}) \times 0.130]$
 $\text{ULEV270 HEV Contribution Factor} = 0.270 - [(\text{Zero-emission VMT Allowance}) \times 0.040]$
 $\text{SULEV230 HEV Contribution Factor} = 0.230 - [(\text{Zero-emission VMT Allowance}) \times 0.030]$
 $\text{SULEV200 HEV Contribution Factor} = 0.200 - [(\text{Zero-emission VMT Allowance}) \times 0.030]$

2.3.3.2(e) Alternate Phase-In Schedules for LEV III MDVs for Manufacturers with a Limited Number of Test Groups. For the 2016 and subsequent model years, a manufacturer, that produces and delivers for sale in California four or fewer medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

2.3.3.2.1 A manufacturer that produces and delivers for sale in California four medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

* * * *

2.3.3.2.2 A manufacturer that produces and delivers for sale in California three medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

* * * *

2.3.3.2.3 A manufacturer that produces and delivers for sale in California two medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

* * * *

2.3.3.2.4 A manufacturer that produces and delivers for sale in California one medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

* * * *

2.3.24 Identifying a Manufacturer's MDV Fleet. Each manufacturer's MDV fleet shall be defined as the total number of California-certified MDVs produced and delivered for sale in California. The percentages shall be applied to the manufacturer's total production of California-certified medium-duty vehicles delivered for sale in California. A manufacturer that elects to certify engines to the optional medium-duty engine standards in title 13, CCR, §1956.8(c), or (h) shall not count those engines in the manufacturer's total production of California-certified medium-duty vehicles for purposes of this subparagraph.

* * * *

3. Calculation of Credits/Debits

3.1 Calculation of NMOG+NOx Credits/Debits

* * * *

3.1.2 Calculation of NMOG+NOx Credits and Debits for Medium-Duty Vehicles Other than MDPVs.

A manufacturer that elects to comply with the phase-in requirements for LEV III medium-duty vehicles other than MDPVs in section E.2.3.1 or section E.2.3.2 shall calculate vehicle-equivalent NMOG+NOx credits in accordance with section E.3.1.2.1. A manufacturer that elects to comply with the alternative phase-in schedule for LEV III medium-duty vehicles other than MDPVs in section E.2.3.3 shall calculate fleet average NMOG+NOx credits in accordance with section E.3.1.2.2.

3.1.2.1 Calculation of Vehicle-Equivalent NMOG+NOx Credits for Medium-Duty Vehicles Other than MDPVs.

3.1.2.1.1 In 2016 and subsequent model years, a manufacturer that produces and delivers for sale in California MDVs, other than MDPVs, in excess of the equivalent requirements for LEV III vehicles certified to the exhaust emission standards set forth in section E.1 of these test procedures shall receive "Vehicle-Equivalent Credits" (or "VECs") calculated in accordance with the

following equation, where the term “produced” means produced and delivered for sale in California:

* * * *

3.1.2.1.2 The MDV HEV VEC factor is calculated as follows:

* * * *

3.1.2.1.3 A manufacturer that fails to produce and deliver for sale in California the equivalent quantity of MDVs certified to LEV III exhaust emission standards, shall receive “Vehicle-Equivalent Debits” (or “VEDs”) equal to the amount of negative VECs determined by the aforementioned equation.

3.1.2.2 Calculation of Fleet Average NMOG+NOx Credits and Debits for Medium-Duty Vehicles Other than MDPVs.

3.1.2.2.1 In 2016 and subsequent model years, a manufacturer shall calculate its medium-duty vehicle fleet average credits or debits using the following equation.

[(Fleet Average NMOG+NOx Requirement) - (Manufacturer's Fleet Average NMOG+NOx Value)] x
(Total No. of Vehicles Produced and Delivered for Sale in California, Including ZEVs and HEVs).

3.1.2.2.2 In 2016 and subsequent model years, a manufacturer that achieves fleet average NMOG+NOx values lower than the fleet average NMOG+NOx requirement for the corresponding model year shall receive credits in units of g/mi NMOG+NOx . A manufacturer with 2016 and subsequent model year fleet average NMOG+NOx values greater than the fleet average requirement for the corresponding model year shall receive debits in units of g/mi NMOG+NOx equal to the amount of negative credits determined by the aforementioned equation. The total g/mi NMOG+NOx credits or debits earned for MDVs 8,501-10,000 lbs. GVWR excluding MDPVs, and for MDVs 10,001-14,000 lbs. GVWR shall be summed together. The resulting amount shall constitute the g/mi NMOG+NOx credits or debits accrued by the manufacturer for the model year. Medium-duty fleet average credits and debits earned in accordance with section E.3.1.2.2 may not be summed together with fleet average credits and debits earned for passenger cars, light-duty trucks, and medium-duty passenger vehicles in accordance with section E.3.1.1.

3.1.2.34 Only ZEVs certified as MDVs and not used to meet the ZEV requirement shall be included in the calculation of VECs or the calculation of NMOG+NOx credits and debits.

3.1.2.45 For a manufacturer that elects to certify engines to the optional medium-duty engine standards in title 13, CCR §1956.8(c) or (h), all such engines used in MDVs, including those produced by a small volume manufacturer, shall be subject to the emissions averaging provisions applicable to heavy-duty diesel or Otto-cycle engines as set forth in the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines,” or the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines, incorporated by reference in title 13, CCR, §1956.8(b) or (d), as applicable.

3.1.3 Procedure for Offsetting NMOG+NOx Debits.

3.1.3.1 A manufacturer shall equalize emission debits by earning g/mi NMOG+NOx emission credits or VECs in an amount equal to the g/mi NMOG+NOx debits or VEDs, or by submitting a commensurate amount of g/mi NMOG+NOx credits or VECs to the Executive Officer that were earned previously or acquired from another manufacturer. A manufacturer shall equalize NMOG+NOx debits for PCs, LDTs, and MDPVs and VEC debits or NMOG+NOx debits, as applicable, for MDVs within three model years. If emission debits are not equalized within the specified time period, the manufacturer shall be subject to the Health and Safety Code §43211 civil penalty applicable to a manufacturer which sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the emission debits are not equalized by the end of the specified time period. A manufacturer demonstrating compliance under Option 2 in section E.2.1.1.1.a, must calculate the emission debits that are subject to a civil penalty under Health and Safety Code section 43211 separately for California, the District of Columbia, and for each individual state that is included in the fleet average greenhouse gas requirements in section E.2.1.1.1.a. The manufacturer must calculate these emission debits separately for California, the District of Columbia, and each individual state using the formula in sections E.3.1.1 and E.3.1.2, except that the “Total No. of Vehicles Produced and Delivered for Sale in California, Including ZEVs and HEVs” shall be calculated separately for the District of Columbia and each individual state.

For the purposes of Health and Safety Code §43211, the number of passenger cars, light-duty trucks, and medium-duty passenger vehicles not meeting the state board's emission standards shall be determined by dividing the total amount of g/mi NMOG+NOx emission debits for the model year by the g/mi NMOG+NOx fleet average requirement for PCs and LDTs 0-3750 lbs. LVW and for LDTs 3751 lbs. LVW - 8500 lbs. GVW and MDPVs applicable for the model year in which the debits were first incurred; and the number of medium-duty vehicles not meeting the state board's emission standards shall be equal to the amount of VEDs incurred or shall be determined by dividing the total amount of g/mi NMOG+NOx emission debits for the model year by the g/mi NMOG+NOx fleet average requirement for MDVs 8,501-10,000 lbs. GVW and for MDVs 10,001 lbs. – 14,000 lbs. GVW applicable for the model year in which the debits were first incurred.

* * * *

3.1.5 Changing Vehicle-Equivalent Credits and Debits to NMOG+NOx Fleet Average Credits and Debits. The value of any vehicle-equivalent credits and debits earned in accordance with section E.3.1.2.1 or title 13, CCR §1961(c)(2) shall be converted to NMOG+NOx fleet average credits and debits using the provisions in section E.3.1.2.2, for each model year in which the credits or debits are accrued. For the purpose of applying the formula in section E.3.1.2.2.1, for credits and debits earned in accordance with title 13, CCR §1961(c)(2), the Fleet Average NMOG+NOx Requirement is 0.364 g/mi for MDVs between 8,501-10,000 lbs. GVWR and 0.592 g/mi for MDVs between 10,001-14,000 lbs. GVWR. These credits and debits are subject to the provisions in section E.3.1.3 or title 13, CCR §1961(c)(3), as applicable, based on the model year in which they are first earned as vehicle-equivalent credits or debits.

* * * *

4. LEV III Criteria Pollutant Interim In-Use Compliance Standards.

The following interim in-use compliance standards shall apply for the first two model years that a test group is certified to ~~the LEV III standards~~ that are more stringent than the standards to which the test group was certified in a prior model year, except as noted in section E.4.3.2.

* * * *

4.3 SFTP Interim In-Use Compliance Emission Standards.

4.3.1 ~~Test groups certified prior to the 2020 model year may use an in-use compliance standard for NMOG+NOx for the first two model years that they are certified to new standards.~~ 2016 and prior model year light-duty and medium-duty passenger vehicle test groups that contain vehicles at or below 6,000 lbs. GVWR, 2017 and prior model year light-duty and medium-duty passenger vehicle test groups with only vehicles above 6,000 lbs. GVWR, and 2019 and prior model year medium-duty vehicle test groups may use an in-use compliance standard for NMOG+NOx for the first two model years that they are certified to LEV III NMOG+NOx standards or a LEV III SFTP NMOG+NOx bin.

* * * *

4.3.2 ~~Test groups certified prior to the 2021 model year will be allowed an in-use compliance standard for PM for the first five model years that they are certified to the SFTP PM standard.~~ 2023 and prior model year light-duty and medium-duty passenger vehicle test groups that certify to a LEV III SFTP PM exhaust emission standard in section E.1.2.2.2 may use an in-use compliance standard for SFTP PM regardless of the model year that the test groups first certified to that LEV III SFTP PM standard. 2022 and prior model year medium-duty vehicle test groups may use an in-use compliance standard for PM for the

first two model years that they are certified to a LEV III SFTP PM exhaust emission standard in section E.1.2.2.4.

(a) For light-duty vehicle test groups and medium-duty passenger vehicle test groups certifying to SFTP PM exhaust emission standards in section E.1.2.2.2, in-use compliance emission standards for PM shall be ~~5.0~~ 10 mg/mi ~~higher than the applicable certification standard.~~

* * * *

F. Requirements and Procedures for Durability Demonstration

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4. §86.1823 Durability demonstration procedures for exhaust emissions.

* * * *

4.2 §86.1823-08. ~~October 15, 2012~~ April 28, 2014. [No change, except that subparagraph (m) applies only to vehicles certifying to the 2012 through 2016 MY National greenhouse gas program.]

* * * *

7. §86.1826 Assigned Deterioration Factors for Small Volume Manufacturers and Small Volume Test Groups.

7.1 §86.1826-01. ~~January 17, 2006~~ April 28, 2014. [No change.]

G. Procedures for Demonstration of Compliance with Emission Standards

* * * *

2. §86.1828 Emission data vehicle selection

2.1 §86.1828-010. ~~February 26, 2007~~ April 28, 2014. Amend as follows:

2.1.1 Add the following sentence to (a): Incomplete medium-duty Otto-cycle and diesel vehicles 8,501-10,000 lbs. GVW certifying to LEV III standards shall be tested in a configuration that represents the maximum curb weight, frontal area, and gross vehicle weight rating affecting the emission certification applicable to that vehicle.

2.2 50°F Requirements.

* * * *

2.2.2 The same test group shall not be selected in the succeeding two years unless the manufacturer produces fewer than three test groups. If the manufacturer produces more than three LEV, LEV630, LEV395, LEV160, ULEV, ULEV570, ULEV400, ULEV340, ULEV270, ULEV250, ULEV200, ULEV125, ULEV70, ULEV50, SULEV, SULEV230, SULEV200, SULEV170, SULEV150, SULEV30, or SULEV20 test groups per model year, the Executive Officer may request 50°F testing of specific test groups. If the manufacturer provides a list of the LEV, LEV630, LEV395, LEV160, ULEV, ULEV570, ULEV400, ULEV340, ULEV270, ULEV250, ULEV200, ULEV125, ULEV70, ULEV50, SULEV, SULEV230, SULEV200, SULEV170, SULEV150, SULEV30, or SULEV20 test groups that it will certify for a model year and provides a description of the technologies used on each test group (including the information in section G.2.32.1), the Executive Officer shall select the test groups subject to 50°F testing within a 30 day period after receiving such a list and description. The Executive Officer may revise the test groups selected after the 30 day period if the information provided by the manufacturer does not accurately reflect the test groups actually certified by the manufacturer.

2.3 LEV III PM Requirements.

2.3.1 Vehicle Selection. A manufacturer shall select emission data and/or engineering development vehicles each year from PC or LDT test groups and separate emission data and/or engineering development vehicles from MDV test groups according to the requirements in section G.3.6. Within each test group, the vehicle configuration shall be selected which is expected to be worst-case for FTP PM exhaust emission compliance on candidate in-use vehicles.

2.3.2 The same test group shall not be selected in the succeeding two years unless the manufacturer produces fewer than four test groups that are certified to LEV III PM standards in section E.1.1.2.1. If the manufacturer produces more than four test groups that are certified to LEV III PM standards per model year, the Executive Officer may request LEV III PM testing of specific test groups. If the manufacturer provides a list of the test groups that it will certify to LEV III PM standards for a model year and provides a description of the technologies used on each test group (including the information in section G.2.3.1), the Executive Officer shall select the test groups subject to LEV III PM testing within a 30 day period after receiving such a list and description. The Executive Officer may revise the test groups selected after the 30 day period if the information provided by the manufacturer does not accurately reflect the test groups actually certified by the manufacturer.

3. §86.1829 Durability data and emission data testing requirements; waivers.

3.1 §86.1829-01. ~~October 15, 2012~~ April 28, 2014. Amend as follows:

* * * *

3.1.4 ~~Amend (b)(4)(i) as follows: All 2015 and subsequent model year emission data vehicles shall be required to be tail pipe tested at 4,000 miles or at the mileage at which the vehicle is stabilized as determined in §86.1827-01 and demonstrate compliance with the California Inspection and Maintenance (“I/M”) emission standards as specified in~~

the “Mandatory Exhaust Emissions Inspection Standards and Test Procedures,” title 16, California Code of Regulations, Section 3340.42. A manufacturer shall have the option of using the I/M test procedures in place at the time of certification or, if the I/M test procedures have been amended within two years of the time of certification, a manufacturer may use the preceding procedures. Test vehicles shall undergo preconditioning procedures prior to the tail-pipe test, which consist of idle conditions for a minimum period of ten minutes after the thermostat is open. Preconditioning and test procedures shall be conducted at an ambient temperature from 68° to 86° F. The manufacturer shall, in accordance with good engineering practices, attest that such test vehicles will meet the requirements of this section when preconditioned and tested at ambient temperatures from 35° to 68° F.

3.1.5 — Amend (b)(4)(ii) as follows: In lieu of testing vehicles according to the provisions of §86.1829(b)(4)(i), a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation of such I/M testing as the manufacturer deems appropriate, all passenger cars and light duty trucks comply with the I/M emission standards.

3.1.64 Delete (b)(5). Idle CO Testing.

3.2 §86.1829-15. February 19, 2015. Amend as follows:

3.2.1 Subparagraph (a) through (b) [No change.]

3.2.2 Subparagraph (c) Add the following: For Otto-cycle vehicles or hybrid vehicles that use Otto-cycle engines, evidence shall be supplied showing that the air/fuel metering system or secondary air injection system is capable of providing sufficient oxygen to theoretically allow enough oxidation to attain the CO emission standards at barometric pressures equivalent to those expected at altitudes ranging from sea level to an elevation of 6000 feet. For fuel injected vehicles or hybrid electric vehicles that use fuel-injected engines, compliance may be demonstrated upon a showing by the manufacturer that the fuel injection system distributes fuel based on mass air flow, rather than volume flow, and is therefore self-compensating. All submitted test proposals will be evaluated on their acceptability by the Executive Officer. As an alternative to the demonstration described above, a manufacturer may demonstrate compliance by testing California vehicle configurations as part of its federal high altitude certification requirements. Engine families that meet all the applicable California low altitude emission standards when tested at the EPA test elevation are deemed to be in compliance. The SFTP standards do not apply to testing at high altitude.

3.2.3 Subparagraph (d) [Delete; see G.3.6 below.]

3.2.4 Subparagraph (e) [Delete. (The provisions of this section that pertain to evaporative testing are contained the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.” The provisions of this section that pertain to refueling testing are contained the “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”)]

3.2.5 Subparagraph (f) [No change.]

3.23 50°F Requirements.

A manufacturer shall demonstrate compliance with the 50°F requirement each year by testing at least three PC or LDT and three MDV emission data and/or engineering development vehicles (with at least 4000 miles) as determined under the provisions of section G.2.32 of these

test procedures. It is not necessary to apply deterioration factors (DFs) to the 50°F test results to comply with this requirement.

3.34 Highway Fuel Economy Test.

The exhaust emissions, including non-methane organic gas emissions, shall be measured from all exhaust emission data vehicles tested in accordance with the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600 Subpart B or 40 CFR §1066.840, as modified in Part II of these test procedures with the migration provisions of §600.111-08 introduction ~~Part 600, Subpart B~~). The oxides of nitrogen emissions measured during such tests shall be multiplied by the oxides of nitrogen deterioration factor computed in accordance with 40 CFR §86.1823 and added to the non-methane organic gas emissions. This sum shall be rounded and compared with the NMOG+NO_x certification level, as required in section E.1.6. All data obtained pursuant to this paragraph shall be reported in accordance with procedures applicable to other exhaust emission data required pursuant to these procedures. In the event that one or more of the manufacturer's emission data vehicles fail the HWFET standard listed in section E of these test procedures, the manufacturer may submit to the Executive Officer engineering data or other evidence showing that the system is capable of complying with the standard. If the Executive Officer finds, on the basis of an engineering evaluation, that the system can comply with the HWFET standard, he or she may accept the information supplied by the manufacturer in lieu of vehicle test data.

3.45 SC03 Test.

* * * *

3.56 LEV III PM Testing Requirements.

For the 2017 and subsequent model years, a manufacturer must submit test data for test groups certifying to the LEV III PM standards in section E.1.1.2.1 according to the following table. Once a test group has been used to meet the requirements of this section G.3.56 for a model year, that same test group shall not be selected in the succeeding two model years unless the manufacturer produces fewer than four test groups that are certified to LEV III PM standards. For all test groups that are certified to LEV III PM standards for which test data is not submitted, the manufacturer must, in accordance with good engineering practices, attest that such test groups will comply with the applicable LEV III PM standards.

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11. §86.1837 Rounding of emission measurements.

11.1 §86.1837-01. ~~February 10, 2000~~ April 28, 2014. [No change.]

11.2 Fleet average NMOG+NO_x value calculations shall be rounded, in accordance with 40 CFR 1065.20 (April 28, 2014) ~~ASTM E29-67~~, to four significant figures before comparing with fleet average NMOG+NO_x requirements.

12. §86.1838 Small volume manufacturers certification procedures.

12.1 §86.1838-01. ~~January 17, 2006~~April 28, 2014. [No change, except that the reference to 15,000 units shall mean 4,500 units in California and the reference to 14,999 units shall mean 4,499 units in California.]

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14. §86.1840 Special test procedures.

14.1 §86.1840-01. ~~August 30, 2006~~June 8, 2012. [No change.]

H. Certification, Information and Reporting Requirements.

1. §86.1841 Compliance with emission standards for the purpose of certification

* * * *

1.4 **Certification of a Federal Vehicle in California.** Whenever a manufacturer federally-certifies a 2015 or subsequent model-year passenger car, light-duty truck or medium-duty vehicle model to the standards for a particular emissions bin that are more stringent than the standards for an applicable California vehicle emissions category, the equivalent California model may only be certified to (i) the California standards for a vehicle emissions category that are at least as stringent as the standards for the corresponding federal emissions bin, or (ii) the exhaust emission standards to which the federal model is certified. However, where the federal exhaust emission standards for the particular emissions bin and the California standards for a vehicle emissions category are equally stringent, the California model may only be certified to either the California standards for that vehicle emissions category or more stringent California standards. The federal emission bins are those contained Tables S04-1 and S04-2 of 40 CFR section 86.1811-04(c) as adopted February 10, 2000, and in Table 2 of 40 CFR §86.1811.17(b), as adopted April 28, 2014. A California vehicle model is to be treated as equivalent to a federal vehicle model if all of the following characteristics are identical: A federal vehicle shall not qualify as an alternative to a LEV III vehicle.

* * * *

1.4.1.1 A vehicle certified to federal Tier II emission Bin 3, ~~or Bin 4,~~ or Bin 8 or to federal Tier III emission Bin 85 or Bin 110 is not required to meet California 50°F exhaust emissions requirements.

* * * *

3. §86.1843 General information requirements

3.1 §86.1843-01. April 28, 2014. [No change.]

3.2 Alternative Fuel Information.

For passenger cars, light-duty trucks, and medium-duty vehicles that use hydrogen fuel, the manufacturer shall submit ~~projected California sales and leases,~~ fuel economy

data, vehicle fuel pressure rating, fuel tank capacity, vehicle type, vehicle range, vehicle name, - name of air basin(s) where vehicles will be delivered for sale or lease, and number of vehicles projected to be delivered to each air basin county, thirty-three months prior to January 1 of the model year for which the vehicles are certified.

For battery electric vehicles and grid-connected hybrid electric vehicles, the manufacturer shall submit projected California sales and leases, vehicle name, fuel economy data (kW per 100 miles), battery energy capacity (kWh), onboard charger rating (kW), and presence of Direct Current (DC) fast charge port, thirty-three months prior to January 1 of the model year for which the vehicles are certified.

* * * *

4. §86.1844 Information Requirements: Application for Certification and Submittal of Information Upon Request.

4.1 §86.1844-01. ~~September 15, 2014~~ February 19, 2015. Amend as follows:

* * * *

4.1.2 Modify §86.1844-01(d) as follows:

(a) Modify §86.1844-01 (d)(7)(i) as follows: For vehicles certified to any LEV III emission standards, include a comparison of drive-cycle metrics as specified in 40 CFR 1066.425(j) for each drive cycle or test phase, as appropriate.

(~~a~~b) Delete §86.1844-01(d)(9).

(c) §86.1844-01(d)(11)(iii). Delete; Replace with: For 2017 and subsequent model vehicles with spark-ignition engines, describe how AECDs are designed to comply with the requirements of section D.2.7. 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.

(~~b~~d) Delete §86.1844-01(d)(15)(ii) and replace it with the following: For vehicles with fuel fired heaters, a manufacturer must include the information specified in section H.4.4.

* * * *

4.1.4 Delete §86.1844-01(e)(7).

* * * *

I. In-Use Compliance Requirements and Procedures

1. §86.1845 Manufacturer in-use verification testing requirements.

1.1 §86.1845-04. ~~May 7, 2010~~ February 19, 2015. Amend as follows:

1.1.1 ~~Table S04-506~~ - California Small Volume Manufacturers and Small Volume Test Groups

California only test group annual sales ¹	1-1,500	1,501-4,500
Low Mileage	Voluntary	0
High Mileage	Voluntary	2 ²

¹ Total annual production of groups eligible for testing under small volume sampling plan is capped at a maximum of 4,500 California-only production volume per model year, per large volume manufacturer. All other remaining large volume manufacturers' small volume test groups shall meet the requirements in Table S04-067 below.

² Particulate emissions must be measured for one vehicle per test group that certifies to the LEV III particulate standards in section E.1.1.2.1 to demonstrate compliance with the applicable FTP standard. The same vehicle must also be tested to demonstrate compliance with the LEV III SFTP particulate standard in section E.1.2.2.2 or E.1.2.2.4, as applicable.

1.1.2 ~~Table S04-607~~ - California Large Volume Manufacturers

California only test groups - annual sales	4,500-15,000	15,001-25,000	>25,000
Low Mileage	2 ¹	3 ²	4 ²
High Mileage	4 ²	5 ³	6 ³

¹ Particulate emissions must be measured for one vehicle per test group that certifies to the LEV III particulate standards in section E.1.1.2.1 to demonstrate compliance with the applicable FTP standard. Each vehicle must also be tested to demonstrate compliance with the LEV III SFTP particulate standard in section E.1.2.2.2 or E.1.2.2.4, as applicable.

² Particulate emissions must be measured for two vehicles per test group that certifies to the LEV III particulate standards in section E.1.1.2.1 to demonstrate compliance with the applicable FTP standard. Each vehicle must also be tested to demonstrate compliance with the LEV III SFTP particulate standard in section E.1.2.2.2 or E.1.2.2.4, as applicable.

³ Particulate emissions must be measured for three vehicles per test group that certifies to the LEV III particulate standards in section E.1.1.2.1 to demonstrate compliance with the applicable FTP standard. Each vehicle must also be tested to demonstrate compliance with the LEV III SFTP particulate standard in section E.1.2.2.2 or E.1.2.2.4, as applicable.

1.1.3 **High Mileage Testing.** Amend subparagraph (c)(2) of 40 CFR §86.1845-04 to read as follows: All test vehicles certified to the emission standards in Part I, section E.1.1.1 of these procedures must have a minimum odometer mileage of 50,000 miles. At least one vehicle of each test group certified to the emission standards in Part I, section E.1.1.1 of these procedures must have a minimum ~~age and~~ odometer mileage of 75,000 for

light-duty vehicles and 90,000 miles for medium-duty vehicles. ~~All test~~ At least one vehicles of each test group certified to the emission standards in Part I, section E.1.1.2 of these test procedures must have a minimum ~~age and~~ odometer mileage of 105,000 miles or 75 percent of full useful life mileage. See §86.1838-01(c)(2) for small volume manufacturer mileage requirements.

1.1.4 **High Altitude Testing.** Amend subparagraph (c)(5)(i) of 40 CFR §86.1845-01~~4~~ to read by adding the following sentence: ~~Each test vehicle shall be tested in accordance with the Federal Test Procedure and the US06 portion of the Supplemental Federal Test Procedure (if applicable) as described in subpart B of this part, when such test vehicle is tested for compliance with the applicable exhaust emission standards under this subpart.~~ High altitude testing shall not apply at 50°F.

* * * *

2. §86.1846 Manufacturer in-use confirmatory testing requirements.

2.1 §86.1846-01. ~~May 7, 2010~~ April 28, 2014. [No Change.]

2.2 If a gasoline vehicle test group that is certified according to the provisions of section D.1.10 and/or D.2.7.5 ~~(p)~~ fails in-use verification testing, as set forth in section I, NMOG and formaldehyde exhaust emissions must be measured for that test group in accordance with section D.4.13 for the purpose of in-use confirmatory testing.

* * * *

J. Procedural Requirements

1. §86.1848-10 Certification. ~~October 15, 2012~~ April 28, 2014. ~~[No change.]~~

Amend as follows:

1.1 Amend (c)(5) as follows: The manufacturer must meet the in-use testing and reporting requirements contained in §§86.1845-04, 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.

* * * *

10. §86.1860-17 How to comply with the Tier 3 fleet average standards. [n/a]

~~101.~~ §86.1861-04 How do the Tier 2 and interim Tier 2 NOx averaging, banking and trading programs work? [n/a]

12. §86.1861-17 How do the NMOG+NOx and evaporative emission credit programs work? [n/a]

~~143.~~ §86.1862-04 Maintenance of records and submittal of information relevant to compliance with fleet average NOx standards. [n/a]

~~124.~~ §86.1863-07 Optional Chassis Certification for Diesel Vehicles. ~~September 15, 2011.~~ [n/a] ~~[No change]~~

135. §86.1865-12 How to comply with the fleet average CO₂ standards. October 15, 2012. [No change, except that this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program.]
146. §86.1866-12 CO₂ fleet average credit programs. October 15, 2012. [No change, except that for the 2012 through 2016 model years this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program.]
157. §86.1867-12 Optional early CO₂ credit programs. October 15, 2012. [No change, except that this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program or the 2017 through 2025 MY National greenhouse gas program.]
18. §86.1868-12 CO₂ credits for improving the efficiency of air conditioning systems. April 28, 2014. [No change, except that this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program or the 2017 through 2025 MY National greenhouse gas program.]
19. §86.1869-12 CO₂ credits for off-cycle CO₂-reducing technologies. October 15, 2012. [No change, except that this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program or the 2017 through 2025 MY National greenhouse gas program.]
20. §86.1870-12 CO₂ credits for qualifying full-size pickup trucks. October 15, 2012. [No change, except that this section shall only apply to vehicles certifying under the 2017 through 2025 MY National greenhouse gas program.]

PART II: CALIFORNIA EXHAUST AND PARTICULATE EMISSION TEST PROCEDURES FOR PASSENGER CARS, LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES

This part describes the equipment required and the procedures necessary to perform gaseous and particulate exhaust emission tests (40 CFR Part 86, Subpart B and 40 CFR Part 1066); cold temperature test procedures (40 CFR Part 86, Subpart C); the California 50°F test procedure; and the supplemental federal test procedure (40 CFR Part 86, Subpart B and 40 CFR Part 1066) on passenger cars, light-duty trucks and medium-duty vehicles.

A. 40 CFR Part 86, Subpart B - Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles and New Light-Duty Trucks and New Otto-Cycle Complete Heavy-Duty Vehicles; Test Procedures.

100.1 General applicability.

86.101 General applicability. ~~October 6, 2000~~ February 19, 2015. No change except as follows.

For 2017 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles, Part II Subpart A may not be used to demonstrate compliance with the LEV III particulate standards in section E.1.1.2.1. 100 percent of 2017 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles certifying to the LEV III particulate standards in section E.1.1.2.1 must be tested using the equipment specifications and measurement procedures that are specific to PM emissions in Part II, Subpart C of these test procedures to demonstrate compliance with the applicable particulate emission standards.

References to Tier 3 emission standards in subsection (b)(2) shall mean LEV III emission standards.

Part II, Subpart A may not be used for 2022 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles to demonstrate compliance with applicable emission standards.

86.102 Definitions. ~~March 5, 1980~~ April 28, 2014.

* * * *

100.2 Equipment and Facility Requirements.

86.106-~~0096~~ Equipment required; overview. ~~October 22, 1996~~ April 28, 2014.

* * * *

86.110-94 Exhaust gas sampling system; diesel-cycle vehicles, and Otto-cycle vehicles requiring particulate emissions measurements. ~~June 30, 1995~~ April 28, 2014.

* * * *

100.3 Certification Fuel Specifications.

86.113-94 Fuel Specifications. ~~February 18, 2000~~ April 28, 2014.

86.113-04 Fuel Specifications. ~~February 10, 2000~~ February 19, 2015.
~~86.113-07 Fuel Specifications. January 18, 2001.~~
86.113-15 Fuel Specifications. April 28, 2014.

100.3.1 California Certification Gasoline Specification.

100.3.1.1 Certification Gasoline Fuel Specifications for LEV II Light-Duty Vehicles and Medium-Duty Vehicles.

Add the following subparagraph which reads: For light-duty vehicles and medium-duty vehicles certified to the LEV II exhaust emission standards set forth in section E.1.1.1, gasoline having the specifications listed below or gasoline having the specifications listed in section 100.3.1.2 or gasoline having the specifications in 40 CFR §1065.710(b) (February 19, 2015) may be used in exhaust and evaporative emission testing as an option to the specifications referred to in §86.113-04(a)(1). If a manufacturer elects to utilize gasoline having the specifications listed below for LEV II vehicles, exhaust emission testing shall be conducted by the manufacturer with gasoline having the specifications listed below, and the Executive Officer shall conduct exhaust emission testing with gasoline having the specifications listed below. If a manufacturer elects to utilize gasoline having the specifications listed in section 100.3.1.2, exhaust emission testing shall be conducted by the manufacturer with gasoline having the specifications listed in section 100.3.1.2, and the Executive Officer shall conduct exhaust emission testing with gasoline having the specifications listed in section 100.3.1.2. If a manufacturer elects to utilize gasoline having the specifications in 40 CFR §1065.710(b) (February 19, 2015), exhaust emission testing shall be conducted by the manufacturer with gasoline having the specifications in 40 CFR §1065.710(b) (February 19, 2015), and the Executive Officer shall conduct exhaust emission testing with gasoline having the specifications in section 40 CFR §1065.710(b) (February 19, 2015). Use of ~~this~~ these fuels for evaporative emission testing shall be required as specified in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles."

* * * *

100.3.1.2 Certification Gasoline Fuel Specifications for LEV III Light-Duty Vehicles and Medium-Duty Vehicles.

Add the following subparagraph which reads: For all light-duty vehicles and medium-duty vehicles certifying to the LEV III standards in section E.1.1.2, gasoline having the specifications listed below may shall be used in exhaust emission testing, as an option to the specifications set forth in 40 CFR §1065.710(b) (February 19, 2015). If a manufacturer elects to utilize gasoline having the specifications listed below, and the Executive Officer shall conduct exhaust emission testing with gasoline having the specifications listed below. If a manufacturer elects to utilize gasoline having the specifications set forth in 40 CFR §1065.710(b) (February 19, 2015), the Executive Officer shall conduct exhaust emission testing with gasoline having the specifications set forth in 40 CFR §1065.710(b) (February 19, 2015). Use of ~~this~~ these fuels for evaporative emission testing shall be required as specified in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles."

California Certification Gasoline Specifications for LEV III Light-Duty Vehicles and Medium-Duty Vehicles		
Fuel Property ^(a)	Limit	Test Method ^(b)
Octane (R+M)/2 ^(c)	87-88.4; 91 (min)	D 2699-88, D 2700-88
Sensitivity	7.5 (min)	D 2699-88, D 2700-88
Lead	0-0.01g/gal (max); no lead added	§2253.4(c), title 13 CCR
Distillation Range:		§2263, title 13 CCR ^(d)
10% point	130-150 °F	
50% point	205-215 °F	
90% point	310-320 °F	
EP, maximum	390 °F	
Residue	2.0 vol. % (max)	
Sulfur	8-11 ppm by wt.	§2263, title 13 CCR
Phosphorous	0.005 g/gal (max)	§2253.4(c), title 13 CCR
RVP	6.9-7.2 psi	§2263, title 13 CCR
Olefins	4.0-6.0 vol. %	§2263, title 13 CCR
Total Aromatic Hydrocarbons	19.5-22.5 vol. %	§2263, title 13 CCR
Benzene	0.6-0.8 vol. %	§2263, title 13 CCR
Multi-substituted Alkyl Aromatic Hydrocarbons	13-15 vol. % ^(e)	
MTBE	0.05 vol. %	§2263, title 13 CCR
Ethanol	9.8 2 -10.2 0 vol. %	<u>§2263, title 13 CCR</u>
Total Oxygen	3.3-3.7 wt. %	§2263, title 13 CCR
Additives	Sufficient to meet requirements of §2257, title 13 CCR	
Copper Corrosion	No. 1	D 130-88
Gum, washed	3.0 mg/100 mL (max)	D 381-86
Oxidation Stability	1000 minutes (min)	D 525-88
Specific Gravity	Report ^(f)	
Heat of Combustion	Report ^(f)	
Carbon	Report wt. % ^(f)	
Hydrogen	Report wt. % ^(f)	

- (a) The gasoline must be blended from typical refinery feedstocks.
- (b) ASTM specification unless otherwise noted. A test method other than that specified may be used following a determination by the Executive Officer that the other method produces results equivalent to the results with the specified method.
- (c) For vehicles/engines that require the use of premium gasoline as part of their warranty, the Octane ((R+M)/2) may be a 91 minimum. All other certification gasoline specifications, as shown in this table, must be met. For all other vehicles/engines, the Octane ((R+M)/2) shall be 87-88.4.
- (d) Although §2263, title 13, CCR refers to the temperatures of the 50 and 90 percent points, this procedure can be extended to the 10 percent and end point temperatures, and to the determination of the residue content.
- (e) "Detailed Hydrocarbon Analysis of Petroleum Hydrocarbon Distillates, Reformates, and Gasoline by Single Column High Efficiency (Capillary) Column Gas Chromatography," by Neil Johansen, 1992, Boulder, CO.
- (f) The fuel producer should report this fuel property to the fuel purchaser. Any generally accepted test method may be used and shall be identified in the report.

100.3.2 Certification Diesel Fuel Specifications.

100.3.2.1 Certification Diesel Fuel Specifications for the 2015 and Subsequent Model Years.

Amend subparagraphs §86.113-0794(b)(2) and (b)(3) as follows:

(b)(2) Except as noted below, petroleum fuel for diesel vehicles meeting the specifications referenced in 40 CFR §86.113-0794 (b)(2), or substantially equivalent specifications approved by the Executive Officer, shall be used in exhaust emission testing. The grade of petroleum fuel recommended by the engine manufacturer, commercially designated as "Type 2-D" grade diesel, shall be used. The petroleum fuel used in exhaust emission testing may meet the specifications listed below, or substantially equivalent specifications approved by the Executive Officer, as an option to the specifications in 40 CFR §86.113-0794 (b)(2). Where a manufacturer elects pursuant to this subparagraph to conduct exhaust emission testing using the specifications of §86.113-0794 (b)(2), or the specifications listed below, the Executive Officer shall conduct exhaust emission testing with the diesel fuel meeting the specifications elected by the manufacturer.

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100.3.4 Mixtures of Petroleum and Alcohol Fuels for Flexible Fuel Vehicles.

Amend §86.113-94(d) as follows:

1. ~~Delete subparagraphs (d)(1) and (d)(2); replace with:~~
~~—— (d)(1)~~

100.3.4.1 Exhaust emission test fuel for emission-data and durability-data vehicles.

For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel alcohol engines, methanol or ethanol fuel used for exhaust emission testing shall meet the applicable specifications set forth in section 2292.2, title 13, CCR, (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) as modified by the following: E-85 that meets the specifications in 40 CFR §1065.725 (April 28, 2014) may be used in exhaust and evaporative emission testing as an option to the E-85 Fuel Ethanol specifications in this subparagraph. If a manufacturer elects to utilize E-85 Fuel Ethanol having the specifications listed below, the Executive Officer shall conduct exhaust emission testing with E-85 Fuel Ethanol having the specifications listed below. If a manufacturer elects to utilize E-85 Fuel Ethanol having the specifications set forth in 40 CFR §1065.725 (April 28, 2014), the Executive Officer shall conduct exhaust emission testing with E-85 Fuel Ethanol having the specifications set forth in 40 CFR §1065.725 (April 28, 2014).

Specification	Limit
M-85 Fuel Methanol	
Petroleum fuel meeting the specifications of section 100.3.1.1	13-16 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.
E-85 Fuel Ethanol	
Petroleum fuel meeting the specifications of section 100.3.1.1	15-21 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.

100.3.4.2 (d)(2) **Mileage accumulation fuel.** For flexible fuel Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles that use Otto-cycle or diesel alcohol engines, petroleum fuel shall meet the applicable specifications in Part II, Sections A.100.3.1.1 or 100.3.2 and methanol or ethanol fuel shall meet the applicable specifications set forth in section 2292.2, title 13, CCR, (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specification for E-85 Fuel Ethanol). Mileage accumulation procedures shall be subject to the requirements set forth in 40 CFR §86.1831-01(a) and (b) and are subject to the prior approval of the Executive Officer. A manufacturer shall consider expected customer fuel usage as well as emissions deterioration when developing its durability demonstration.

~~2. Subparagraph (d)(3) [No Change.]~~

100.3.4.3 ~~Add the following subparagraphs.~~ **Evaporative emission test fuel for emission-data and durability-data vehicles.** For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel alcohol engines, the fuel for evaporative emission testing shall be the gasoline set forth in Part II, Section A.100.3.1.2 of these test procedures. A manufacturer may alternatively demonstrate compliance with the applicable evaporative emission standards using gasoline test fuel meeting the specifications set forth in 40 CFR §1065.710(b) (April 28, 2014) if the manufacturer also uses the evaporative emission test procedures set forth in 40 CFR §§86.107-96 through 86.143-96 in place of the test procedures set forth in the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.” Alternative alcohol-gasoline blends may be used in place of E10 if demonstrated to result in equivalent or higher evaporative emissions, subject to prior approval of the Executive Officer. For refueling testing, the test fuel shall be the fuel specified in the “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”

100.3.4.4 **Additive requirements.** Fuel additives and ignition improvers intended for use in alcohol test fuels shall be subject to the approval of the Executive Officer. In order for such approval to be granted, a manufacturer must demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

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~~100.3.8 §86.113-07(h).~~ [No Change.]

100.3.98 Identification of New Clean Fuels to be Used in Certification Testing.

Any person may petition the state board to establish by regulation certification testing specifications for a new clean fuel for which specifications for a new clean fuel are not specifically set forth in ~~paragraphs 40 CFR §86.113-94, §86.113-04, or §86.113-0715, or §1065.710~~, as amended herein. Prior to adopting such specifications, the state board shall consider the relative cost-effectiveness of use of the fuel in reducing emissions compared to the use of other fuels. Whenever the state board adopts specifications for a new clean fuel for certification testing, it shall also establish by regulation specifications for the fuel as it is sold commercially to the public.

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86.115-~~0078~~ EPA urban-dynamometer driving schedules. ~~October 22, 1996~~ April 28, 2014.

100.4 Calibration methods and frequency.

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86.117-96 Evaporative emission enclosure calibrations. ~~December 8, 2005~~ April 28, 2014.

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100.5 Test Procedures and Data Requirements.

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86.128-~~0079~~ Transmissions. ~~October 22, 1996~~ April 28, 2014.

* * * *

86.130-~~0096~~ Test sequence; general requirements. ~~October 22, 1996~~ April 28, 2014.

100.5.2 California test sequence; general requirements.

100.5.2.1 Delete subparagraph (a) of §86.130-~~0096~~ and replace with:

For purposes of determining conformity with 50°F test requirements, the procedures set forth in Part II, Section ~~CD~~. For all hybrid electric vehicles and all ~~2001 and subsequent model-year~~ vehicles certifying to running loss and useful life evaporative emission standards, the test sequence specified in “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles” as incorporated by reference in section 1976, title 13, CCR shall apply.

100.5.2.2 Add the following:

A manufacturer has the option of simulating air conditioning operation during testing at other ambient test conditions provided it can demonstrate that the vehicle tailpipe exhaust emissions are representative of the emissions that would result from the SC03 cycle test

procedure and the ambient conditions of paragraph 86.161-00. ~~The Executive Officer has approved two optional air conditioning test simulation procedures, AC1 and AC2, for the 2001 to 2003 model years only.~~ If a manufacturer desires to conduct an alternative SC03 test simulation ~~other than AC1 and AC2, or the AC1 and AC2 simulations for the 2004 and subsequent model years,~~ the simulation test procedure must be approved in advance by the Executive Officer (see paragraphs ~~86.162-00 and 86.162-03~~).

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86.131-~~0096~~ Vehicle preparation. ~~October 22, 1996~~ April 28, 2014.

* * * *

86.133-96 Diurnal breathing loss test. ~~August 23, 1995~~ April 28, 2014.

86.134-96 Running loss test. ~~December 8, 2005~~ April 28, 2014.

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86.137-~~964~~ Dynamometer test run, gaseous and particulate emissions. ~~March 24, 1993~~ April 28, 2014.

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86.142-90 Records required. ~~June 30, 1995~~ April 28, 2014.

86.143-96 Calculations; evaporative emissions. ~~August 23, 1995~~ April 28, 2014.

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100.5.4 Calculations; exhaust emissions.

100.5.4.1 The exhaust emission calculations for California are set forth in the “California Non-Methane Organic Gas Test Procedures for 1993 through 2016 Model Year Vehicles;” or the “California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles;” as applicable.

* * * *

100.5.5 California exhaust emission test procedures for Supplemental Federal Test Procedures ~~US06 emissions.~~

This section applies to passenger cars, light-duty trucks, and medium-duty vehicles fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels. This section also applies to hybrid electric vehicles. The procedures of this subpart apply to both certification and in-use vehicles unless otherwise indicated. For model year 2015 and 2016 vehicles, a manufacturer may use either the exhaust emission test procedures in this section or the exhaust emission test procedures set forth in 40 CFR §1066.831 for the US06, US06 Bag 2, and Hot 1435 LA92 test cycles. For 2017 and subsequent model years, these vehicles shall be

subject to the exhaust emission test procedures in 40 CFR §1066.831 for US06, US06 Bag 2, and Hot 1435 LA92 test cycles.

100.5.5.1 US06 Test Procedure

Amend §86.159-08 as follows:

1. Add the following sentence: The exhaust PM emissions shall be measured using equivalent measurement techniques as those used to measure exhaust PM emissions on the FTP cycle except that provisions accounting for the cold start portion of the FTP cycle (including factors used to weight emission values from the different phases) shall be ignored.

~~2.100.5.5.2~~ Delete subparagraph (b)(9) of §86.159-08 and replace with:
During dynamometer operation, a fixed speed cooling fan with a maximum discharge velocity of 15,000 cubic feet per minute or a road speed modulated fan as specified in §86.107–96(d)(1) may be used. The fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner. The engine compartment cover shall remain open if a fixed speed cooling fan is used and closed if a road speed modulated fan is used. In the case of vehicles with front engine compartments, the fan shall be squarely positioned within 24 inches (61 centimeters) of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The Executive Officer may approve modified cooling configurations or additional cooling if necessary to satisfactorily perform the test. In approving requests for additional or modified cooling, the Executive Officer will consider such items as actual road cooling data and whether such additional cooling is needed to provide a representative test.

100.5.5.32 **Hot 1435 LA92 (Hot 1435 Unified Cycle) Test Procedure.**

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100.5.5.43 **US06 Bag 2 Test Procedure.**

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2. Amend 40 CFR 86.159-08 as follows:

2.1 Delete Paragraph (a); replace with: **Overview.**

The dynamometer operation consists of a single, 365 second test starting as shown in Part II, Section FG. This cycle will herein be referred to as “US06 Bag 2.” The vehicle is preconditioned in accordance with the instructions in this section to bring it up to a warmed-up, stabilized condition. This preconditioning is followed by a 1 to 2 minute idle period that proceeds directly into the US06 Bag 2 driving schedule during which continuous proportional samples of gaseous emissions are collected for analysis.

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~~86.162-00 Approval of alternative air conditioning test simulations and descriptions of AC1 and AC2. October 22, 1996.~~

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~~86.167-17 AC17 Air Conditioning Emissions Test Procedure. October 15, 2012. [No change, except that for the 2012 through 2016 model years, this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program.]~~

B. 40 CFR Part 86, Subpart C - Emission Regulations for 1994 and Later Model Year Gasoline-Fueled New Light-Duty Vehicles, New Light-Duty Trucks and New Medium-Duty Passenger Vehicles; Cold Temperature Test Procedures.

86.201-11 General applicability. ~~December 27, 2006~~ February 19, 2015.

200.1 California applicability.

No change to §86.201, except as follows.

Amend subparagraph 86.201-94(a) as follows: This subpart describes procedures for determining the cold temperature carbon monoxide (CO) emissions from 2015 ~~and later~~ through 2021 model year new passenger cars, light-duty trucks, and medium-duty vehicles (excluding natural gas, diesel-fueled, and zero-emission vehicles).

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86.213-11 Fuel specifications. ~~December 27, 2006~~ February 19, 2015.

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Appendix I to Part 86 -- Urban Dynamometer Schedules. ~~April 29, 1998~~ February 19, 2015.

C. 40 CFR Part 1066 – Vehicle-Testing Procedures.

The Certification Fuel Specifications in Part II, Subpart A, section 100.3 shall apply to vehicles tested using Part II, Subpart C.

1. Subpart A – Applicability and General Provisions.

1066.1 Applicability. April 28, 2014. Amend as follows:

Delete §1066.1(a) and replace it with the following:

All 2022 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles must be tested in accordance with Part II, Subpart C to demonstrate compliance with all applicable emission standards.

In the 2017 and subsequent model years, a manufacturer must test 100 percent of its passenger cars, light-duty trucks, and medium-duty vehicles certifying to the LEV III particulate standards in section E.1.1.2.1 using the equipment specifications and measurement procedures that are specific to PM emissions in Part II, Subpart C of these test procedures to demonstrate compliance with the applicable particulate emission standards.

Except as noted above, for the 2015 through 2021 model years, a manufacturer may test LEV III passenger cars, light-duty trucks, and medium-duty vehicles and LEV II passenger cars, light-duty trucks, and medium-duty vehicles certifying to the exhaust standards in section E.1.1.1 using either Part II, Subpart A or Part II, Subpart C of these test procedures to demonstrate compliance with applicable emission standards.

1066.2 Submitting information to EPA under this part. April 28, 2014.

1066.5 Overview of this part 1066 and its relationship to the standard-setting part. April 28, 2014.

1066.10 Other procedures. February 19, 2015.

1066.15 Overview of test procedures. April 28, 2014.

1066.20 Units of measure and overview of calculations. April 28, 2014.

1066.25 Recordkeeping. April 28, 2014.

2. Subpart B – Equipment, Measurement Instruments, Fuel, and Analytical Gas Specifications.

1066.101 Overview. April 28, 2014.

1066.105 Ambient controls and vehicle cooling fans. April 28, 2014.

1066.110 Equipment specifications for emission sampling systems. April 28, 2014.

1066.120 Measurement instruments. April 28, 2014.

1066.125 Data updating, recording, and control. April 28, 2014.

1066.130 Measurement instrument calibrations and verifications. April 28, 2014

1066.135 Linearity verification. April 28, 2014.

1066.140 Diluted exhaust flow calibration. April 28, 2014.

1066.145 Engine fluids, test fuels, analytical gases, and other calibration standards. April 28, 2014. Amend as follows:

2.1 Delete subparagraph (a) and replace with:

California Test Fuel. Use test fuel as specified in Part II, section A.100.3.

2.2 Subparagraphs (b) through (e). [No change.]
1066.150 Analyzer interference and quench verification limit. April 28, 2014.

3. Subpart C – Dynamometer Specifications.

1066.201 Dynamometer Overview. April 28, 2014.
1066.210 Dynamometers. April 28, 2014.
1066.215 Summary of verification and calibration procedures for chassis dynamometers. April 28, 2014.
1066.220 Linearity verification for chassis dynamometer systems. April 28, 2014.
1066.225 Roll runout and diameter verification procedure. April 28, 2014.
1066.230 Time verification procedure. April 28, 2014.
1066.235 Speed verification procedure. February 19, 2015.
1066.240 Torque transducer calibration. April 28, 2014.
1066.245 Response time verification. April 28, 2014.
1066.250 Base inertia verification. April 28, 2014.
1066.255 Parasitic loss verification. February 19, 2015.
1066.260 Parasitic friction compensation evaluation. April 28, 2014.
1066.265 Acceleration and deceleration verification. April 28, 2014.
1066.270 Unloaded coastdown verification. February 19, 2015.
1066.275 Daily dynamometer readiness verification. April 28, 2014.
1066.290 Driver’s aid. April 28, 2014.

4. Subpart D – Coastdown.

1066.301 Overview of road-load determination procedures. February 19, 2015.
1066.305 Procedures for specifying road-load forces for motor vehicles at or below 14,000 pounds GVWR. February 19, 2015.
1066.310 Coastdown procedures for motor vehicles above 14,000 pounds GVWR. April 28, 2014.
1066.315 Dynamometer road-load setting. April 28, 2014.

5. Subpart E – Preparing Vehicles and Running an Exhaust Emission Test.

1066.401 Overview. April 28, 2014.
1066.405 Vehicle preparation and preconditioning. April 28, 2014.
1066.410 Dynamometer test procedure. February 19, 2015.
1066.415 Vehicle operation. April 28, 2014.
1066.420 Test preparation. February 19, 2015.
1066.425 Performing emission tests. April 28, 2014.

6. Subpart F – Hybrids and Electric Vehicles. [n/a; All zero-emission vehicles and hybrid electric vehicles must demonstrate compliance with all applicable exhaust emission standards in accordance with the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes” or the “California Exhaust Emission

Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” as applicable.]

7. Subpart G – Calculations.

1066.601 Overview. April 28, 2014.

1066.605 Mass-based and molar-based exhaust emission calculations. February 19, 2015.

1066.610 Dilution air background correction. April 28, 2014.

1066.615 NOx intake-air humidity correction. February 19, 2015.

1066.620 Removed water correction. April 28, 2014.

1066.625 Flow meter calibration calculations. April 28, 2014.

1066.630 PDP, SSV, and CFV flow rate calculations. April 28, 2014.

1066.635 NMOG determination. February 19, 2015. [n/a]

California NMOG Determination. The provisions of section D.3 shall apply. A manufacturer may use the conversion factors in sections D.1.10 and D.2.7.5 as alternatives to those set forth in this section §1066.635.

1066.695 Data requirements. April 28, 2014.

8. Subpart H – Cold-Temperature Test Procedures.

1066.701 Applicability and general provisions. February 19, 2015.

1066.710 Cold temperature testing procedures for measuring CO and NMHC emissions and determining fuel economy. February 19, 2015.

9. Subpart I – Exhaust Emission Test Procedures for Motor Vehicles.

1066.801 Applicability and general provisions. February 19, 2015.

1066.805 Road load power, test weight, and inertia weight class determination. April 28, 2014.

1066.810 Vehicle preparation. April 28, 2014.

1066.815 Exhaust emission test procedures for FTP testing. February 19, 2015.

1066.816 Vehicle preconditioning for FTP testing. April 28, 2014.

1066.820 Composite calculations for FTP exhaust emissions. April 28, 2014.

1066.830 Supplementary Federal Test Procedures; overview. April 28, 2014.

1066.831 Exhaust emission test procedures for aggressive driving. February 19, 2015.

Amend §1066.831 as follows:

1. Replace all references to “US06 Highway” with “US06 Bag 2.” Where §1066.831 references another section of 40 CFR part 1066, replace all mentions of “US06 Highway” with “US06 Bag 2” in referenced sections.

2. Replace all references to “Hot LA-92” with “Hot 1435 Unified Cycle.” The cycle herein referred to as “Hot 1435 Unified cycle” consists of a single test starting

from second 0 and ending at second 1435 in the driving schedule shown in Part II, Section H.

1066.835 Exhaust emission test procedures for SC03 emissions. February 19, 2015.

1066.840 Highway fuel economy test procedure. April 28, 2014.

1066.845 AC17 Air conditioning efficiency test procedure. February 19, 2015.

10. Subpart K – Definitions and Other Reference Material.

1066.1001 Definitions. February 19, 2015.

1066.1005 Symbols, abbreviations, acronyms, and units of measure. February 19, 2015.

1066.1010 Incorporation by reference. February 19, 2015.

GD. 50°F Emission Test Procedure.

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DE. Unified Cycle Driving Schedule.

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EF. Highway Driving Schedule.

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FG. US06 Bag 2 Driving Schedule.

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GH. Hot 1435 Unified Cycle Driving Schedule.

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