

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

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 adopted March 22, 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 “\* \* \* \*”.

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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 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75361 (December 1, 2011)~~]. Amend as follows:

\* \* \* \*

**B. Definitions, Acronyms and Abbreviations**

**1. §86.1803 Definitions.**

1.1 §86.1803-01. October 15, 2012 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75361 (December 1, 2011)~~]. [No change, except as otherwise noted below.]

**2. California Definitions.**

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**"EPA Vehicle Simulation Tool"** means the "EPA Vehicle Simulation Tool" as incorporated by reference in 40 CFR §86.1 in the Notice of Proposed Rulemaking for EPA's 2017 and subsequent MY National Greenhouse Gas Program, as proposed ~~November 16, 2011~~ [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75357 (December 1, 2011)~~], which is incorporated by reference in section 1961.2, title 13, CCR.

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

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**“Full-size pickup truck”** means a light-duty truck that has a passenger compartment and an open cargo box and which meets the following specifications:

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

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

3. A minimum towing capability of 5,000 pounds, where minimum towing capability is determined by subtracting the gross vehicle weight rating from the gross combined weight rating, or a minimum payload capability of 1,700 pounds, where minimum payload capability is determined by subtracting the curb weight from the gross vehicle weight rating.

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**“Methane Reactivity Adjustment Factor”** means a factor applied to the mass of methane emissions from natural gas fueled vehicles for the purpose of determining the gasoline equivalent ozone-forming potential of the methane emissions.

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**“2012 through 2016 MY National greenhouse gas program”** or **“2012 through 2016 MY National greenhouse gas final rule”** means the national program that applies to new 2012 through 2016 model year passenger cars, light-duty trucks, and medium-duty passenger vehicles as adopted by the U.S. Environmental Protection Agency on April 1, 2010 (75 Fed. Reg. 25324, 25677 (May 7, 2010)), as incorporated in and amended by these test procedures.

**“2017 through 2025 MY National greenhouse gas program” or “2017 through 2025 MY National greenhouse gas final rule”** means the national program that applies to new 2017 through 2025 model year passenger cars, light-duty trucks, and medium-duty passenger vehicles as adopted by the U.S. Environmental Protection Agency as codified in 40 CFR Part 86, Subpart S, as incorporated in and amended by these test procedures.

**“Natural gas vehicle”** means any motor vehicle that is engineered and designed to be operated using either compressed natural gas or liquefied natural gas.

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**“Small volume manufacturer”** means any manufacturer that meets the “small volume manufacturer” definition as set forth in section 1900, title 13, CCR. ~~whose projected or combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line are fewer than 4,500 units based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. A manufacturer’s California sales shall consist of all vehicles or engines produced by the manufacturer and delivered for sale in California, except that vehicles or engines produced by the manufacturer and marketed in California by another manufacturer under the other manufacturer’s nameplate shall be treated as California sales of the marketing manufacturer.~~

~~Except as provided in the last paragraph of this definition, for the 2015 through 2017 model years, the annual sales from different firms shall be aggregated in the following situations: (1) vehicles produced by two or more firms, one of which is 10% or greater part owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of 10% or more in each of the firms; or (3) vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies; or (4) vehicles imported or distributed by any firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity.~~

~~Except as provided in the last paragraph of this definition, for the 2018 and subsequent model years, the annual sales from different firms shall be aggregated in the following situations: (1) vehicles produced by two or more firms, one of which is 33.4% or greater part owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of 33.4% or more in each of the firms; or (3) vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies; or (4) vehicles imported or distributed by any firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity.~~

~~For the purposes of this paragraph, all manufacturers whose annual sales are aggregated together under the provisions of this definition shall be defined as “related manufacturers.” Notwithstanding such aggregation, the Executive Officer may make a determination of operational independence if all of the following criteria are met for at least 24 months preceding the application submittal: (1) for the three years preceding the year in which the initial application is submitted, the average California sales for the applicant does not exceed 4,500 vehicles per year; (2) no financial or other support of economic value is provided by related manufacturers for purposes of design, parts procurement, R&D and production facilities and operation, and any other transactions between related manufacturers are conducted under normal~~

~~commercial arrangements like those conducted with other parties, at competitive pricing rates to the manufacturer; (3) related manufacturers maintain separate and independent research and development, testing, and production facilities; (4) related manufacturers do not use any vehicle powertrains or platforms developed or produced by related manufacturers; (5) patents are not held jointly with related manufacturers; (6) related manufacturers maintain separate business administration, legal, purchasing, sales, and marketing departments, as well as autonomous decision making on commercial matters; (7) the overlap of the Board of Directors between related manufacturers is limited to 25% with no sharing of top operational management, including president, chief executive officer, chief financial officer, and chief operating officer, and provided that no individual overlapping director or combination of overlapping directors exercises exclusive management control over either or both companies; and (8) parts or components supply between related companies must be established through open market process, and to the extent that the manufacturer sells parts/components to non-related manufacturers, it does so through the open market at competitive pricing. Any manufacturer applying for operational independence must submit to ARB an Attestation Engagement from an independent certified public accountant or firm of such accountants verifying the accuracy of the information contained in the application, as defined by and in accordance with the procedures established in 40 C.F.R. §80.125, as last amended January 19, 2007, which is incorporated by reference in section 1900, title 13, CCR. The applicant must submit information to update any of the above eight criteria as material changes to any of the criteria occur. If there are no material changes to any of the criteria, the applicant must certify that to the Executive Officer annually. With respect to any such changes, the Executive Officer may consider extraordinary conditions (e.g., changes to economic conditions, unanticipated market changes, etc.) and may continue to find the applicant to be operationally independent. In the event that a manufacturer loses eligibility as a “small volume manufacturer” after a material change occurs, the manufacturer must begin compliance with the primary emissions program in the third model year after the model year in which the manufacturer loses its eligibility. The Executive Officer may, in his or her discretion, re-establish lost “small volume manufacturer” status if the manufacturer shows that it has met the operational independence criteria for three consecutive years.~~

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**“Subconfiguration”** means a unique combination within a vehicle configuration that meets the criteria in 40 CFR §600.002-08 (October 15, 2012).

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

1. §86.1810-09. ~~July 6, 2011~~ October 15, 2012 Amend §86.1810-09 as follows:

This section applies to model year 2015 and later light-duty vehicles, 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.

\* \* \* \*

(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. For LEV II vehicles that are certified using the California Gasoline Fuel Specifications set forth in Part II, section 100.3.1.1, manufacturers must multiply NMHC measurements by an adjustment factor of 1.04 before comparing with the NMOG standard to determine compliance 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, manufacturers must 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 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 this paragraph is calculated using the following formula:

$$\text{Adjustment factor} = 1.0302 + 0.0071 \times \text{volume percent fuel ethanol}$$

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 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.

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## **E. California Exhaust Emission Standards.**

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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.

**1.1.1 LEV II Exhaust Standards.** The following LEV II standards are the maximum exhaust emissions for the intermediate and full useful life from new 2015 through 2019 model year LEVs, ULEVs, and SULEVs, including fuel-flexible, bi-fuel and dual fuel

vehicles when operating on the gaseous or alcohol fuel they are designed to use, except that for the 2015 through 2019 model years, SULEV exhaust standards shall only apply to vehicles that receive partial zero-emission vehicle credits according to the criteria set forth in 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” 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,” incorporated by reference in section 1962.2, title 13, CCR. Vehicles that are certified to the particulate standards in section E.1.1.2.1 may not certify to LEV II standards.

2015 – 2019 model-year LEV II LEV vehicles may be certified to the 150,000 mile NMOG+NOx emission standards numerical values for LEV160, LEV395, or LEV630, as applicable, in section E.1.1.2 and the corresponding NMOG+NOx numerical values in section E.1.4.2, in lieu of the separate NMOG and NOx exhaust emission standards in this section E.1.1.1 and the corresponding NMOG+NOx numerical values in section E.1.4.1; and LEV II ULEV vehicles may be certified to the 150,000 mile NMOG+NOx emission standards numerical values for ULEV125, ULEV340, or ULEV570, as applicable, in section E.1.1.2 and the corresponding NMOG+NOx numerical values in section E.1.4.2, in lieu of the separate NMOG and NOx exhaust emission standards in this section E.1.1.1 and the corresponding NMOG+NOx numerical values in section E.1.4.1; and LEV II SULEV vehicles may be certified to the NMOG+NOx numerical values for SULEV30, SULEV170, or SULEV230, as applicable, in section E.1.1.2 and the corresponding NMOG+NOx numerical values in section E.1.4.2, in lieu of the separate NMOG and NOx exhaust emission standards in this section E.1.1.1 and the corresponding NMOG+NOx numerical values in section E.1.4.1. 2015 – 2019 model-year LEV II SULEV vehicles that receive a partial ZEV allowance 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” and 2015 – 2016 model year vehicles that are allowed to certify to LEV II SULEV standards using “carryover” of emission test data under the provisions in section E.2.2 may be certified to the 150,000 mile NMOG+NOx emission standards for SULEV30, SULEV170, or SULEV230, as applicable, in section E.1.1.2 and the corresponding NMOG+NOx numerical values in section E.1.4.2, in lieu of the separate NMOG and NOx exhaust emission standards in this section E.1.1.1 and the corresponding NMOG numerical values in section E.1.4.1. LEV II SULEV vehicles that do not either (1) receive a partial ZEV allowance or (2) certify to LEV II SULEV standards in the 2015 – 2016 model years using “carryover” of emission test data may not certify to combined NMOG+NOx standards. LEV II vehicles that certify to combined NMOG+NOx standards will be treated as LEV II vehicles for purposes of the fleet-wide phase-in requirements.

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**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.

<b>LEV III Exhaust Mass Emission Standards for New 2015 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles</b>						
Vehicle Type	Durability Vehicle Basis (mi)	Vehicle Emission Category <sup>2</sup>	NMOG + Oxides of Nitrogen (g/mi)	Carbon Monoxide (g/mi)	Formaldehyde (mg/mi)	Particulates <sup>1</sup> (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	0.395	6.4	6	0.12
		ULEV340	0.340	<del>3.26</del> .4	6	0.06
		ULEV250	0.250	<del>2.6</del> .4	6	0.06
		ULEV200	0.200	<del>2.64</del> .2	6	0.06
		SULEV170	0.170	<del>1.54</del> .2	6	0.06
		SULEV150	0.150	<del>1.53</del> .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	0.630	7.3	6	0.12
		ULEV570	0.570	<del>3.7</del> .3	6	0.06
		ULEV400	0.400	<del>3.07</del> .3	6	0.06
		ULEV270	0.270	<del>3.04</del> .2	6	0.06
		SULEV230	0.230	<del>1.74</del> .2	6	0.06
		SULEV200	0.200	<del>1.73</del> .7	6	0.06

<sup>1</sup> 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.

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



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**1.1.2.1 LEV III Particulate Standards.**

**1.1.2.1.1 Particulate Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.** Beginning in the 2017 model year, a manufacturer, except a small volume manufacturer, shall certify a percentage of its passenger car, light-duty truck, and medium-duty passenger vehicle fleet to the following particulate standards according to the following phase-in schedule. These standards represent the maximum particulate emissions allowed at full useful life. All vehicles certifying to these particulate standards must certify to the LEV III exhaust emission standards set forth in section E.1.1.2.

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**1.1.2.1.4 Alternative Phase-in Schedule for Particulate Standards.**

**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 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, in the 2021 model year 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.

**1.1.2.1.4.2 Alternative Phase-in Schedules for the 1 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 1 mg/mi particulate standard phase-in requirements as long as equivalent PM emission reductions are achieved by the 2028 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 1 mg/mi particulate standard in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 4 for the 2025 model year, 3 for the 2026 model year, 2 for the 2027

model year, and 1 for the 2028 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 2028 model year, the cumulative total must be equal to or greater than 500 and 100 percent of the manufacturer's passenger cars, light-duty trucks, and medium-duty passenger vehicles must be certified to the 1 mg/mi particulate standard in the 2028 model year to be considered equivalent. A manufacturer may add vehicles introduced before the 2025 model year (e.g., the percent of vehicles introduced in 2024 would be multiplied by 4) to the cumulative total.

**1.1.2.1.4.3 Alternative Phase-in Schedules for the Particulate Standards for Medium-Duty Vehicles Other than Medium-Duty Passenger Vehicles.** A manufacturer may use an alternative phase-in schedule to comply with the particulate standard phase-in requirements as long as equivalent PM emission reductions are achieved by the 2021 model year from medium-duty vehicles other than medium-duty passenger vehicles. Model year emission reductions shall be calculated by multiplying the total percent of MDVs certified to the 8 mg/mi PM standard or to the 10 mg/mi PM standard, as applicable, 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 MDVs shall be summed together to determine a cumulative total for MDVs. In the 2021 model year, the cumulative total must be equal to or greater than 490, and 100 percent of the manufacturer's MDVs must be certified to the 8 mg/mi PM standard or to the 10 mg/mi PM standard, as applicable, in the 2021 model year 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.**

**1.2.1 4,000-mile SFTP Exhaust Emission Standards for Light- and Medium-Duty Vehicles.** The following standards represent the maximum SFTP exhaust emissions at 4,000 miles for 2015 through ~~2020~~2021 model year passenger cars, and light-duty truck and medium-duty vehicles (less than 8,501 pounds gross vehicle weight rating) certifying to the LEV II exhaust emission standards in section E.1.1.1:

<b>SFTP Exhaust Emission Standards for LEV II Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles<sup>1,2</sup></b>						
<i>Vehicle Type</i>	<i>Gross Vehicle Weight Rating (lbs.)</i>	<i>Test Weight<sup>3</sup> (lbs.)</i>	<i>US06 Test (g/mi)</i>		<i>A/C Test (g/mi)</i>	
			<i>NMHC + NOx</i>	<i>CO</i>	<i>NMHC + NOx</i>	<i>CO</i>
PC	All	All	0.14	8.0	0.20	2.7
LDT	≤ 6000 lbs.	0-3750 lbs.	0.14	8.0	0.20	2.7
		3751-5750 lbs.	0.25	10.5	0.27	3.5
MDV	6,001-8,500 lbs.	3751-5750 lbs.	0.40	10.5	0.31	3.5
		5751-8500 lbs.	0.60	11.8	0.44	4.0

<sup>1</sup> For certification purposes, testing shall be conducted at 4000 miles ±250 miles or at the mileage determined by the manufacturer for emission-data vehicles.

<sup>2</sup> The following definitions apply for purposes of this SFTP standards table only:

“LDT” (light-duty truck) is any motor vehicle rated at 6,000 pounds gross vehicle weight rating or less, which is designed primarily for purposes of transportation of property or is a derivative of such a vehicle, or is available with special features enabling off-street or off-highway operation and use.

“MDV” (medium-duty vehicle) is any motor vehicle having a manufacturer's gross vehicle weight rating of greater than 6,000 pounds and less than 14,001 pounds, except passenger cars and light-duty trucks. Vehicles with a gross vehicle weight rating over 8,500 pounds are exempted from the requirements of this section E.1.2.1.

<sup>3</sup> PCs and LDTs are tested at their loaded vehicle weight (curb weight plus 300 lbs.). MDVs are tested at their adjusted loaded vehicle weight (average of curb weight and GVWR).

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

### 1.2.2.1 SFTP NMOG+NOx 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+NOx 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.

\* \* \* \*

**1.2.2.1.2 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. In the case of fuel-flexible vehicles, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2.

For each test group subject to this subsection, manufacturers shall calculate a Composite Emission Value for NMOG+NOx 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+NOx or CO emission value, as applicable, determined through the US06 test;  
"SC03" = the test group's NMOG+NOx or CO emission value, as applicable, determined through the SC03 test; and  
"FTP" = the test group's NMOG+NOx 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+NOx composite emission standard applicable to the model year, manufacturers shall use a sales-weighted fleet average of the NMOG+NOx 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+NOx, 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+NOx sales-weighted fleet-average

composite emission value for the fleet and the CO composite emission value for each test group shall not exceed:

<b>SFTP NMOG+NOx and CO Composite Emission Standards for 2015 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles</b>											
<b>(g/mi)<sup>1</sup></b>											
<b>Model Year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025+</b>
All PCs; LDTs 8,500 lbs. GVWR or less; and MDPVs <sup>3</sup>	<i>Sales-Weighted Fleet Average NMOG+NOx Composite Exhaust Emission Standards<sup>2, 4,5,6</sup></i>										
	0.140	0.110	0.103	0.097	0.090	0.083	0.077	0.070	0.063	0.057	0.050
Vehicles in this category are tested at their loaded vehicle weight (curb weight plus 300 pounds) <u>except LEV II vehicles, which are subject to the test weights specified in §1960.1(r), title 13, CCR.</u>	<i>CO Composite Exhaust Emission Standard<sup>7</sup></i>										
	4.2										

<sup>1</sup> *Mileage for Compliance.* All test groups certifying to LEV III FTP emission standards on a 150,000-mile durability basis shall also certify to the SFTP on a 150,000-mile durability basis, as tested in accordance with these test procedures.

<sup>2</sup> *Determining NMOG+NOx Composite Emission Values of LEV II Test Groups and Cleaner Federal Vehicles.* For test groups certified to LEV II FTP emission standards, SFTP emission values shall be converted to NMOG+NOx and projected out to 120,000 miles or 150,000 miles (depending on LEV II FTP certification) using deterioration factors or aged components. ~~NMHC emission values for the US06 and SC03 test cycles shall be converted to NMOG emission values by multiplying by a factor of 1.03.~~ In lieu of deriving a deterioration factor specific to SFTP test cycles, carry-over LEV II test groups may use the applicable deterioration factor from the FTP cycle in order to determine the carry-over composite emission values for the purpose of the NMOG+NOx sales-weighted fleet-average calculation. If an SFTP full-useful life emission value is used to comply with the LEV II SFTP 4k standards, that value may be used in the sales-weighted fleet-average without applying an additional deterioration factor. For federally-certified test groups certifying in California in accordance with Section H subparagraph 1.4, the full-useful life emission value used to comply with federal full-useful life SFTP requirements may be used in the sales-weighted fleet-average without applying an additional deterioration factor. In all cases, NMHC emission values for the US06 and SC03 test cycles shall be converted to NMOG emission values by multiplying by a factor of 1.03.

<sup>3</sup> MDPVs are excluded from SFTP NMOG+NOx and CO emission standards and the sales-weighted fleet average until they are certified to LEV III FTP 150,000-mile NMOG+NOx and CO requirements.

<sup>4</sup> LEV III test groups shall certify to bins in increments of 0.010 g/mi. Beginning with the 2018 model year, vehicles may not certify to bin values above a maximum of 0.180 g/mi.

<sup>5</sup> *Calculating the sales-weighted average for NMOG+NOx.* For each model year, the manufacturer shall calculate its sales-weighted fleet-average NMOG+NOx composite emission value as follows.

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

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 72 of this table, for carry-over LEV II test groups.

\* \* \* \*

### **1.7 Requirement to Generate Additional NMOG+NOx Fleet Average Credit.**

A vehicle that is certified to the LEV III standards in section E.1.1.2, which does not generate a partial ZEV allocation according to the criteria set forth in 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 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," a manufacturer may subtract 5 mg/mi from the NMOG+NOx emission standard value set forth in section E.3.1.1 when calculating the manufacturer's fleet average, provided that the manufacturer extends the performance and defects warranty period to 15 years or 150,000 miles, whichever occurs first, except that the time period is to be 10 years for a zero emission energy storage device (such as battery, ultracapacitor, or other electric storage device).

\* \* \* \*

## **2. Emission Standards Phase-In Requirements for Manufacturers.**

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

2.1.1 The fleet average non-methane organic gas plus oxides of nitrogen exhaust mass emission values from the passenger cars, light-duty trucks, and medium-duty passenger vehicles produced and delivered for sale in California each model year by a manufacturer other than a small volume manufacturer shall not exceed:

<b>FLEET AVERAGE NON-METHANE ORGANIC GAS PLUS OXIDES OF NITROGEN EXHAUST MASS EMISSION REQUIREMENTS FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY PASSENGER VEHICLES</b> (150,000 mile Durability Vehicle Basis)		
Model Year	Fleet Average NMOG + NOx (g/mi)	
	All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751 lbs. LVW - 8500 lbs. GVWR; All MDPVs
2014 <sup>1</sup>	0.107	0.128
2015	0.100	0.119
2016	0.093	0.110
2017	0.086	0.101
2018	0.079	0.092
2019	0.072	0.083
2020	0.065	0.074
2021	0.058	0.065
2022	0.051	0.056
2023	0.044	0.047
2024	0.037	0.038
2025+	0.030	0.030

<sup>1</sup> For the 2014 model year, a manufacturer may comply with the fleet average NMOG+NOx values in this table in lieu of complying with the NMOG fleet average values in 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.” A manufacturer must either comply with the NMOG+NOx fleet average requirements for both its PC/LDT1 fleet and its LDT2/MDPV fleet or comply with the NMOG fleet average requirements for both its PC/LDT1 fleet and its LDT2/MDPV fleet. A manufacturer must calculate its fleet average NMOG+NOx values using the applicable full useful life standards.

\* \* \* \*

**2.1.1.2 PZEVs Anti-Backsliding Requirement.** In the 2018 and subsequent model years, a manufacturer must produce and deliver for sale in California a minimum percentage of its passenger car and light-duty truck fleet that certifies to SULEV30 and SULEV20 standards. This minimum percentage must be equal to the average percentage of PZEVs produced and deliver for sale in California for that manufacturer for the 2015 through 2017 model year. A manufacturer may calculate this average percentage using

the projected sales for these model years in lieu of actual sales. The percentage of a manufacturer's passenger car and light-duty truck fleet that certifies to SULEV30 and SULEV20 standards averaged across the applicable model year and the two previous model years shall be used to determine compliance with this requirement, beginning with the 2020 model year.

\* \* \* \*

2.1.4 **Treatment of ZEVs.** ZEVs classified as LDTs (>3750 lbs. LVW) that have been counted toward the ZEV requirement for PCs and LDTs (0-3750 lbs. LVW) as specified in section C of the "California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes" and 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," shall be included ~~in this equation~~ as LDTs in the calculation of a fleet average NMOG+NOx value.

\* \* \* \*

## 2.4 Implementation Schedules for SFTP Emission Standards.

2.4.1 **Phase-In Requirement for PC, LDT, and MDPV Manufacturers.** A test group certifying to LEV III FTP emission categories on a 150,000-mile durability basis shall also certify to SFTP requirements on a 150,000-mile durability basis.

Manufacturers shall have two options for phase in to the SFTP NMOG+NOx and CO emission standards.

\* \* \* \*

(b) Under Option 2, for 2015 and subsequent model years, a manufacturer shall certify its fleet of PCs, LDTs, and MDPVs such that the manufacturer's sales-weighted fleet-average NMOG+NOx composite emission value and each test group's CO composite emission value does not exceed the applicable composite emission standards in effect for that model year in accordance with section E.1.2.2.1.2. ~~During the 150,000-mile durability phase in, the sales-weighted fleet-average NMOG+NOx composite emission value shall be calculated using a combination of carry-over values and new-certification values. Carry-over test groups shall convert values to NMOG+NOx and may use the applicable deterioration factor from the FTP cycle in lieu of deriving a deterioration factor specific to SFTP test cycles. Any vehicle certified to SFTP requirements on a 150,000-mile durability basis shall be subject to the applicable emission standards for the full useful life of that vehicle. Compliance with the CO composite emission standard cannot be demonstrated through fleet averaging.~~



Beginning with the 2017 model year, a manufacturer shall certify its PCs, LDTs, and MDPVs certifying to LEV III FTP PM emission standards on a 150,000-mile durability basis to the SFTP PM emission standards in section E.1.2.2.2.

\* \* \* \*

## **2.5 Greenhouse Gas Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.**

\* \* \* \*

*2.5.1 Fleet Average Carbon Dioxide Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* For the purpose of determining compliance with this section E.2.5, the applicable fleet average CO<sub>2</sub> mass emissions standards for each model year is the sales-weighted average of the calculated CO<sub>2</sub> exhaust mass emission target values for each manufacturer. For each model year, the sales-weighted fleet average CO<sub>2</sub> mass emissions value shall not exceed the sales-weighted average of the calculated CO<sub>2</sub> exhaust mass emission target values for that manufacturer.

\* \* \* \*

*2.5.1.3 Calculation of Fleet Average Carbon Dioxide Standards.* For each model year, a manufacturer must comply with its fleet average CO<sub>2</sub> standards for passenger cars and for light-duty trucks plus medium-duty passenger vehicles, as applicable, calculated for that model year as follows. A manufacturer shall calculate separate fleet average CO<sub>2</sub> values for its passenger car fleet and for its combined light-duty truck plus medium-duty passenger vehicle fleet.

\* \* \* \*

### 2.5.1.3.4 Optional Compliance Via the 2017 through 2025 MY National Greenhouse Gas Program.

For the 2017 through 2025 model years, a manufacturer may elect to demonstrate compliance with section E.2.5 by demonstrating compliance with the 2017 through 2025 MY National greenhouse gas program as follows:

2.5.1.3.4.1 A manufacturer that selects compliance with this option must notify the Executive Officer of that selection, in writing, prior to the start of the applicable model year or must comply with section E.2.5;

2.5.1.3.4.2 The manufacturer must submit to ARB all data that it submits to EPA in accordance with the reporting requirements as required under 40 CFR §86.1865-12, for demonstrating compliance with the 2017 through 2025 MY National greenhouse gas program and the EPA determination of compliance. All such data must be submitted within 30 days of receipt of the EPA determination of

compliance for each model year that a manufacturer selects compliance with this option;

2.5.1.3.4.3 The manufacturer must provide to the Executive Officer separate values for the number of vehicles produced and delivered for sale in California, the District of Columbia, and each individual state that has adopted California's greenhouse gas emission standards for that model year pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507), the applicable fleet average CO<sub>2</sub> standards for each of these model types and footprint values, the calculated fleet average CO<sub>2</sub> value for each of these model types and footprint values, and all values used in calculating the fleet average CO<sub>2</sub> values.

\* \* \* \*

*2.5.3 Alternative Fleet Average Standards for Manufacturers with Limited U.S. Sales.* Manufacturers meeting the criteria in this section E.2.5.3 may request that the Executive Officer establish alternative fleet average CO<sub>2</sub> standards that would apply instead of the standards in section E.2.5.1. The provisions of this section E.2.5.3 are applicable only to the 2017 and subsequent model years.

\* \* \* \*

*2.5.3.3 How to Request Alternative Fleet Average Standards.* Eligible manufacturers may petition for alternative standards for up to five consecutive model years if sufficient information is available on which to base such standards.

\* \* \* \*

2.5.3.3.4. A manufacturer may elect to petition for alternative standards under this section E. 2.5.3.3 by submitting to ARB a copy of the data and information submitted to EPA as required under 40 CFR §86.1818-12 (g) (October 15, 2012), as incorporated by reference herein, and the EPA approval of the manufacturer's request for alternative fleet average standards for the 2017 through 2025 MY National Greenhouse Gas Program.

\* \* \* \*

*2.5.6 Credits for Reduction of Air Conditioning Direct Emissions.* Manufacturers may generate A/C Direct Emissions Credits by implementing specific air conditioning system technologies designed to reduce air conditioning direct emissions over the useful life of their vehicles. A manufacturer may only use an A/C Direct Emissions Credit for vehicles within a model type upon approval of the A/C Direct Emissions Credit for that model type by the Executive Officer. The conditions and requirements for obtaining approval of an A/C Direct Emissions Credit are described below.

\* \* \* \*

2.5.6.3 The calculation of A/C Direct Emissions Credit depends on the refrigerant or type of system, and is defined in paragraphs E. 2.5.6.3.1, E. 2.5.6.3.2, and E. 2.5.6.3.3.

#### 2.5.6.3.1 HFC-134a vapor compression systems

For A/C systems that use HFC-134a refrigerant, the A/C Direct Emissions Credit shall be calculated using the following formula:

$$A/C \text{ Direct Credit} = \text{Direct Credit Baseline} \times \left(1 - \frac{LR}{\text{Avg LR}}\right)$$

Where:

*Direct Credit Baseline* = 12.6 gCO<sub>2</sub>e/mi for passenger cars;

*Direct Credit Baseline* = 15.6 gCO<sub>2</sub>e/mi for light-duty trucks and medium-duty passenger vehicles;

*Avg LR* = 16.6 grams/year for passenger cars;

*Avg LR* = 20.7 grams/year for light-duty trucks and medium-duty passenger vehicles;

*LR* = the larger of *SAE LR* or *Min LR*;

Where:

*SAE LR* = initial leak rate evaluated using SAE International's Surface Vehicle Standard SAE J2727 (Revised ~~February 2012~~ August 2008) incorporated by reference in section 1961.2, title 13, CCR;

*Min LR* = 8.3 grams/year for passenger car A/C systems with belt-driven compressors;

*Min LR* = 10.4 grams/year for light-duty truck and medium-duty passenger vehicle A/C systems with belt-driven compressors;

*Min LR* = 4.1 grams/year for passenger car A/C systems with electric compressors;

*Min LR* = 5.2 grams/year for light-duty truck and medium-duty passenger vehicle A/C systems with electric compressors.

Note: Initial leak rate is the rate of refrigerant leakage from a newly manufactured A/C system in grams of refrigerant per year. The Executive Officer may allow a manufacturer to use an updated version of ~~the August 2008 version of~~ SAE J2727 or an alternate method if s/he determines that the updated SAE J2727 or the alternate method provides more accurate estimates of the initial leak rate of A/C systems than the February 2012 ~~August 2008~~ version of SAE J2727 does.

#### 2.5.6.3.2 Low-GWP vapor compression systems

For A/C systems that use a refrigerant having a GWP of 150 or less, the A/C Direct Emissions Credit shall be calculated using the following formula:

$$A/C \text{ Direct Credit} = \text{Low GWP Credit} - \text{High Leak Penalty}$$

Where:

$$\text{Low GWP Credit} = \text{Max Low GWP Credit} \times \left(1 - \frac{\text{GWP}}{1,430}\right),$$

and

*High Leak Penalty*

$$= \begin{cases} \text{Max High Leak Penalty}, & \text{if } \text{SAE LR} > \text{Avg LR}, \\ \text{Max High Leak Penalty} \times \frac{\text{SAE LR} - \text{Min LR}}{\text{Avg LR} - \text{Min LR}}, & \text{if } \text{Min LR} < \text{SAE LR} \leq \text{Avg LR}, \\ 0, & \text{if } \text{SAE LR} \leq \text{Min LR}. \end{cases}$$

Where:

*Max Low GWP Credit* = 13.8 gCO<sub>2</sub>e/mi for passenger cars;

*Max Low GWP Credit* = 17.2 gCO<sub>2</sub>e/mi for light-duty trucks and medium-duty passenger vehicles;

*GWP* = the global warming potential of the refrigerant over a 100-year horizon, as specified in section E.2.5.6.6;

*Max High Leak Penalty* = 1.8 gCO<sub>2</sub>e/mi for passenger cars;

*Max High Leak Penalty* = 2.1 gCO<sub>2</sub>e/mi for light-duty trucks and medium-duty passenger vehicles;

*Avg LR* = 13.1 g/yr for passenger cars;

*Avg LR* = 16.6 g/yr for light-duty trucks and medium-duty passenger vehicles;

and where:

*SAE LR* = initial leak rate evaluated using SAE International's Surface Vehicle Standard SAE J2727 (Revised ~~February 2012~~ ~~August 2008~~);

*Min LR* = 8.3 g/yr for passenger cars;

*Min LR* = 10.4 g/yr for light-duty trucks and medium-duty passenger vehicles.

Note: Initial leak rate is the rate of refrigerant leakage from a newly manufactured A/C system in grams of refrigerant per year. The Executive Officer may allow a manufacturer to use an updated version of SAE J2727 or an alternate applicable test method if s/he finds the update or the alternate method provides more accurate estimates of the initial leak rate of A/C systems than the ~~February 2012~~ ~~August 2008~~ version of SAE J2727 does.

\* \* \* \*

2.5.7 *Credits for Improving Air Conditioning System Efficiency.* Manufacturers may generate CO<sub>2</sub> credits by implementing specific air conditioning system technologies designed to reduce air conditioning-related CO<sub>2</sub> emissions over the useful life of their passenger cars, light-duty trucks, and/or medium-duty passenger vehicles. Credits shall be calculated according to this section E.2.5.7 for each air conditioning system that the manufacturer is using to generate CO<sub>2</sub> credits. The eligibility requirements specified in section E.2.5.7.5 must be met before an air conditioning system is allowed to generate credits.

\* \* \* \*

2.5.7.5 For the purposes of this section E.2.5.7.5, the AC17 Test Procedure shall mean the AC17 Air Conditioning Efficiency Test Procedure set forth in 40 CFR §86.167-17, as amended by ~~Part II, Section A.100.5-6~~ of these test procedures.

\* \* \* \*

2.5.10 Mid-Term Review of the 2022 through 2025 MY Standards. The Executive Officer shall conduct a mid-term review to re-evaluate the state of vehicle technology to determine whether any adjustments to the stringency of the 2022 through 2025 model year standards are appropriate. California's mid-term review will be coordinated with its planned full participation in EPA's mid-term evaluation as set forth in 40 CFR §86.1818-12 (h).

\* \* \* \*

### 3. Calculation of Credits/Debits

#### 3.1 Calculation of NMOG+NO<sub>x</sub> Credits/Debits

\* \* \* \*

3.1.1.2 In 2015 and subsequent model years, a manufacturer that achieves fleet average NMOG+NO<sub>x</sub> values lower than the fleet average NMOG+NO<sub>x</sub> requirement for the corresponding model year shall receive credits in units of g/mi NMOG+NO<sub>x</sub>. A manufacturer with 2015 and subsequent model year fleet average NMOG+NO<sub>x</sub> values greater than the fleet average requirement for the corresponding model year shall receive debits in units of g/mi NMOG+NO<sub>x</sub> equal to the amount of negative credits determined by the aforementioned equation. The total g/mi NMOG+NO<sub>x</sub> credits or debits earned for PCs and LDTs 0-3750 lbs. LVW, ~~for LDTs 3751-5750 lbs. LVW~~ and for LDTs 3751 lbs. LVW - 8500 lbs. GVWR, and MDPVs shall be summed together. The resulting amount shall constitute the g/mi NMOG+NO<sub>x</sub> credits or debits accrued by the manufacturer for the model year.

\* \* \* \*

3.1.3 **Procedure for Offsetting NMOG+NOx Debits.**

\* \* \* \*

3.1.3.2 For the 2015 and subsequent model years, ~~t~~The emission credits earned in any given model year shall retain full value through five subsequent model years. Credits will have no value if not used by the beginning of the sixth model year after being earned.

\* \* \* \*

**3.2 Calculation of Greenhouse Gas Credits/Debits.**

Credits and debits that are earned as part of the 2012 through 2016 MY National greenhouse gas program shall not be applicable to California’s greenhouse gas program.

\* \* \* \*

**3.2.4 Use of Greenhouse Gas Emission Credits to Offset a Manufacturer’s ZEV Obligations.**

3.2.4.1 For a given model year, a manufacturer that has Greenhouse Gas credits remaining after equalizing all of its Greenhouse Gas debits may use those Greenhouse Gas credits to comply with its ZEV obligations for that model year, in accordance with the provisions set forth in 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,”~~ incorporated by reference in section 1962.1, title 13, CCR, 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,” incorporated by reference in section 1962.2, title 13, CCR.

\* \* \* \*

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

\* \* \* \*

**4.2 LEV III Particulate Interim In-Use Compliance Standards.**

**4.2.1 LEV III Particulate Interim In-Use Compliance Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.** For the 2017 through 2024 model years, the interim in-use compliance standard for vehicles certifying to the 3 mg/mi particulate standard is 6 mg/mi. For the 2025 through 2028 model years, the interim in-use compliance standard for vehicles certifying to the 1 mg/mi particulate standard is 2 mg/mi.

\* \* \* \*

**F. Requirements and Procedures for Durability Demonstration**

\* \* \* \*

**4. §86.1823 Durability demonstration procedures for exhaust emissions.**

\* \* \* \*

4.2 §86.1823-08. October 15, 2012 ~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75371 (December 1, 2011)~~. [No change, except that subparagraph (m) applies only to vehicles certifying to the 2012 through 2016 MY National greenhouse gas program.]

4.3 **SFTP**. These procedures are not applicable to vehicles certified to the SFTP standards set forth in section E.1.2.2~~1~~.

4.4 **HEVs**. A manufacturer shall consider expected customer usage as well as emissions deterioration when developing its durability demonstration for HEVs.

4.5 Separate deterioration factors must be calculated and reported for NMOG emissions and for NOx emissions for each durability group.

\* \* \* \*

**G. Procedures for Demonstration of Compliance with Emission Standards**

\* \* \* \*

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

\* \* \* \*

3.1 §86.1829-01. ~~May 7, 2010~~ October 15, 2012. Amend as follows:

\* \* \* \*

**11. §86.1837 Rounding of emission measurements.**

\* \* \* \*

11.2 Fleet average NMOG+NOx value calculations shall be rounded, in accordance with ASTM E29-67, to four significant figures before comparing with fleet average NMOG+NOx requirements.

\* \* \* \*

**H. Certification, Information and Reporting Requirements.**

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

1.1 §86.1841-01. July 6, 2011. [No Change.]

1.1.1 For vehicles operating on natural gas, the methane mass emission value shall be multiplied by 0.0047 (the methane reactivity adjustment factor) and added to the NMOG mass emission value and the NOx mass emission value. This result shall be compared to the NMOG+NOx exhaust emission standards to determine compliance with the standards.

\* \* \* \*

**1.4 Certification of a Federal Vehicle in California.**

\* \* \* \*

1.4.1 Except as noted in H.1.4.1.1 and H.1.4.1.2, if a federally-certified vehicle model is certified in California in accordance with subparagraph 1.4, the model shall be subject to the federal requirements for FTP exhaust emissions and cold CO emissions. The vehicle model shall be subject to all other California requirements including evaporative emissions, OBD II, SFTP emissions, 50°F exhaust emissions, highway NMOG+NOx emissions, greenhouse gas emissions, and emissions warranty.

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

1.4.1.2 If a federally-certified vehicle model is certified in California in accordance with subparagraph 1.4 based on a comparison of the sum of the 120,000 mile federal standards to the sum of the 120,000 mile LEV II NMOG and NOx standards, that federally-certified vehicle model shall be subject to the federal requirements for highway NOx and is not required to meet California highway NMOG+NOx emissions requirements.

1.4.2 Prior to certification of a 2015 or subsequent model-year vehicle, a manufacturer must submit information sufficient to enable the Executive Officer to determine whether there is a federally-certified vehicle model for that model year that is equivalent to the California vehicle model based on the criteria listed in subparagraph 1.54.

\* \* \* \*

1.4.6 The tune up label shall meet the federal requirements applicable to such a vehicle with an additional sentence which reads: “This vehicle conforms to federal regulations and is certified for sale in California.” The value used in the California Environmental Performance Label shall be the California emission category to which the vehicle was deemed certified for fleet average NMOG+NOx purposes.

\* \* \* \*



**3. §86.1843 General information requirements**

\* \* \* \*

**3.2 Alternative Fuel Information.**

For passenger cars, light-duty trucks, and medium-duty vehicles ~~not certified exclusively on gasoline or diesel, except for vehicles that use hydrogen fuel, the manufacturer shall submit projected California sales and fuel economy data nineteen months prior to January 1 of the model year for which the vehicles are certified.~~ For vehicles that use hydrogen fuel, the manufacturer shall submit projected California sales and leases, fuel economy data, vehicle fuel pressure rating, 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, thirty-three months prior to January 1 of the model year for which the vehicles are certified.

\* \* \* \*

**I. In-Use Compliance Requirements and Procedures**

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

1.1 §86.1845-04. May 7, 2010. Amend as follows:

\* \* \* \*

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 vehicles 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 ~~42,500~~ 105,000 miles. See §86.1838-01(c)(2) for small volume manufacturer mileage requirements.

\* \* \* \*

**J. Procedural Requirements**

1. §86.1848-10 Certification. ~~July 6, 2011~~ October 15, 2012. [No change.]

\* \* \* \*

13. §86.1865-12 How to comply with the fleet average CO<sub>2</sub> standards. October 15, 2012 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75371 (December 1, 2011).~~] [No change, except that this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program.]
14. §86.1866-12 CO<sub>2</sub> fleet average credits for advanced technology vehicles programs. October 15, 2012 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75372 (December 1, 2011).~~] [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.]
15. §86.1867-12 Optional early CO<sub>2</sub> credit programs. October 15, 2012 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75387 (December 1, 2011).~~] [No change, except that this section shall only apply to vehicles certifying under the 2012 through 2016 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); 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) 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.**

\* \* \* \*

**100.2 Equipment and Facility Requirements.**

\* \* \* \*

- 86.111-94 Exhaust gas analytical-system. October 15, 2012 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75357 (December 1, 2011).~~] [No change.]

\* \* \* \*

**100.5 Test Procedures and Data Requirements.**

\* \* \* \*

86.135-12 Dynamometer procedure. October 15, 2012 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75357 (December 1, 2011)~~]. [No change.]

\* \* \* \*

86.159-08 Exhaust emission test procedures for US06 emissions. December 27, 2006.

**100.5.5 California exhaust emission test procedures for US06 emissions.**

\* \* \* \*

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.

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

Amend §86.159-08 as follows: Add the following sentences: 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. The NMOG, CO, NOx, and formaldehyde emissions shall be measured according to the US06 Test Procedure as set forth in Subpart B, 40 CFR 86.159-08 with the following modifications:

\* \* \* \*

2. Amend 40 CFR 86.159-08 as follows:

\* \* \* \*

2.2 Paragraph (b)

2.2.1 Subparagraphs (1) through (8) [No change.]

2.2.2 Delete subparagraph (9); replace with: **Dynamometer activities.**

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.

2.3 Paragraph (c) through (f) [No change.]

100.5.5.4 **US06 Bag 2 Test Procedure.**

Amend §86.159-08 as follows: Add the following sentences: 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. The NMOG, CO, NOx, and formaldehyde emissions shall be measured according to the US06 Test Procedure as set forth in Subpart B, 40 CFR §86.159-08 with the following modifications:

\* \* \* \*

2. Amend 40 CFR 86.159-08 as follows:

\* \* \* \*

2.2 Paragraph (b)

2.2.1 Subparagraphs (1) through (8) [No change.]

2.2.2 Delete subparagraph (9); replace with: **Dynamometer activities.**

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.

2.3 Paragraph (c) through (f) [No change.]

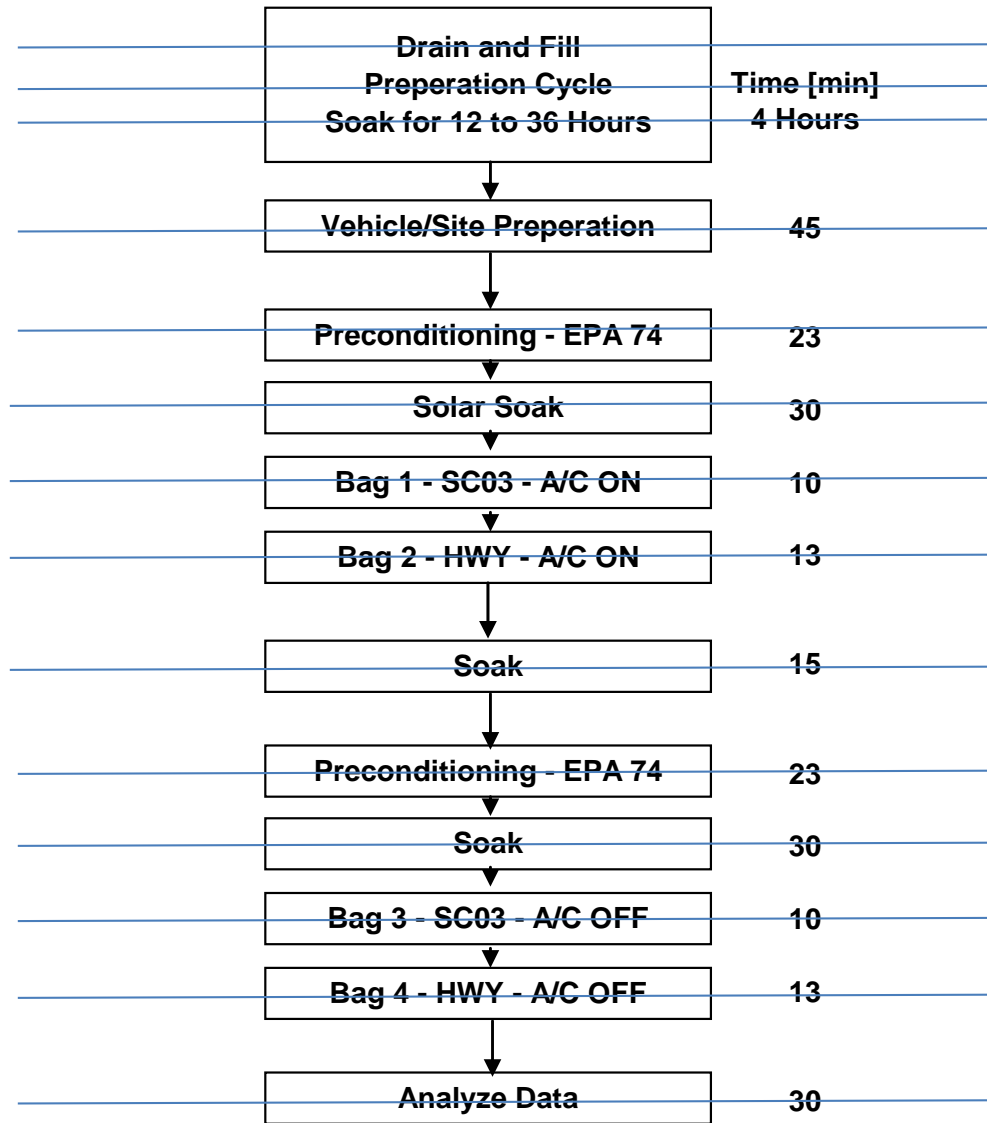
\* \* \* \*

- 86.165-12 Air Conditioning idle test procedure. October 15, 2012 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75357 (December 1, 2011).~~] [No change, except that for the 2016 model years, this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program.]
- ~~86.166-12 Method for calculating emissions due to air conditioning leakage. [Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75357 (December 1, 2011)]. [No change, except that this section shall only apply to vehicles certifying under the 2012 through 2016 MY National greenhouse gas program.]~~
- 86.167-17 AC17 Air Conditioning Efficiency Emissions Test Procedure. October 15, 2012 [~~Insert Federal Register for the 2017 and subsequent MY National Greenhouse Gas Final Rule as proposed at 76 Fed. Reg. 74854, 75358 (December 1, 2011).~~] [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.]

**~~100.5.6 AC17 Air Conditioning Efficiency Test Procedure.~~**

~~1. Overview. The dynamometer operation consists of four elements: a preconditioning cycle, a 30 minute soak period under simulated solar heat, an SC03 drive cycle, and a Highway Fuel Economy Test (HWFET) drive cycle. The vehicle is preconditioned with the UDDS to bring the vehicle to a warmed-up stabilized condition. This preconditioning is followed by a 30 minute vehicle soak (engine off) that proceeds directly into the SC03 driving schedule, during which continuous proportional samples of gaseous emissions are collected for analysis. The SC03 driving schedule is followed immediately by the HWFET cycle, during which continuous proportional samples of gaseous emissions are collected for analysis. The entire test, including the preconditioning driving, vehicle soak, and SC03 and HWFET official test cycles, is conducted in an environmental test facility. The environmental test facility must be capable of providing the following nominal ambient test conditions of: 77 °F air temperature, 50 percent relative humidity, a solar heat load intensity of 850 W/m<sup>2</sup>, and vehicle cooling air flow proportional to vehicle speed. Section §86.161-00 discusses the minimum facility requirements and corresponding control tolerances for air conditioning ambient test conditions. The entire test sequence is run twice, with and without the vehicle's air conditioner operating during the SC03 and HFET test cycles. For gasoline-~~

fueled Otto cycle vehicles, the composite samples collected in bags are analyzed for THC, CO, CO<sub>2</sub>, and CH<sub>4</sub>. For petroleum fueled diesel cycle vehicles, THC is sampled and analyzed continuously according to the provisions of §86.110. Parallel bag samples of dilution air are analyzed for THC, CO, CO<sub>2</sub>, and CH<sub>4</sub>. The following figure shows the basic sequence of the test procedure.



**2. ~~Dynamometer requirements.~~**

2.1 ~~Tests shall be run on a large single roll electric dynamometer or an equivalent dynamometer configuration that satisfies the requirements of §86.108-00.~~

~~2.2 — Position (vehicle can be driven) the test vehicle on the dynamometer and restrain.~~

~~2.3 — Required dynamometer inertia weight class selections are determined by the test vehicle's test weight basis and corresponding equivalent weight as listed in the tabular information of §86.129-00(a) and discussed in §86.129-00 (e) and (f).~~

~~2.4 — Set the dynamometer test inertia weight and roadload horsepower requirements for the test vehicle (see §86.129-00 (e) and (f)). The dynamometer's horsepower adjustment settings shall be set such that the force imposed during dynamometer operation matches actual road load force at all speeds.~~

~~2.5 — The vehicle speed as measured from the dynamometer rolls shall be used. A speed vs. time recording, as evidence of dynamometer test validity, shall be supplied at request of the Executive Officer.~~

~~2.6 — The drive wheel tires may be inflated up to a gauge pressure of 45 psi (310 kPa), or the manufacturer's recommended pressure if higher than 45 psi, in order to prevent tire damage. The drive wheel tire pressure shall be reported with the test results.~~

~~2.7 — The driving distance, as measured by counting the number of dynamometer roll or shaft revolutions, shall be determined for the test.~~

~~2.8 — Four wheel drive and all wheel drive vehicles may be tested either in a four wheel drive or a two wheel drive mode of operation. In order to test in the two wheel drive mode, four wheel drive and all wheel drive vehicles may have one set of drive wheels disengaged; four wheel and all wheel drive vehicles which can be shifted to a two wheel mode by the driver may be tested in a two wheel drive mode of operation.~~

### ~~3. — **Test cell ambient conditions.**~~

#### ~~3.1 — **Ambient air temperature.**~~

~~3.1.1 — Ambient air temperature is controlled, within the test cell, during all phases of the test sequence to  $77 \pm 2$  °F on average and  $77 \pm 5$  °F as an instantaneous measurement.~~

~~3.1.2 — Air temperature is recorded continuously at a minimum of 30 second intervals. Records of cell air temperatures and values of average test temperatures are maintained by the manufacturer for all certification related programs.~~

#### ~~3.2 — **Ambient humidity.**~~

~~3.2.1 — Ambient humidity is controlled, within the test cell, during all phases of the test sequence to an average of  $69 \pm 5$  grains of water/pound of dry air.~~

~~3.2.2 — Humidity is recorded continuously at a minimum of 30 second intervals. Records of cell humidity and values of average test humidity are maintained by the manufacturer for all certification related programs.~~

~~3.3 — **Solar heat loading.** The requirements of 86.161-00(d) regarding solar heat loading specifications shall apply. The solar load of  $850 \text{ W/m}^2$  is applied only during specified portions of the test sequence.~~

~~4. — **Interior temperature measurement.** The interior temperature of the vehicle shall be measured during the emission sampling phases of the test(s).~~

~~4.1 — Interior temperatures shall be measured by placement of thermocouples at the following locations:~~

~~4.1.1 — The outlet of the center duct on the dash.~~

~~4.1.2—Behind the driver and passenger seat headrests. The location of the temperature measuring devices shall be 30 mm behind each headrest and 330 mm below the roof.~~

~~4.2—The temperature at each location shall be recorded a minimum of every 5 seconds.~~

~~5.—**Air conditioning system settings.** For the portion of the test where the air conditioner is required to be operating the settings shall be as follows:~~

~~5.1—Automatic systems shall be set to automatic and the temperature control set to 72 °F.~~

~~5.2—Manual systems shall be set at the start of the SC03 drive cycle to full cool with the fan on the highest setting and the airflow setting to “recirculation.” Within the first idle period of the SC03 drive cycle (186 to 204 seconds) the fan speed shall be reduced to the setting closest to 6 volts at the motor, the temperature setting shall be adjusted to provide 55 °F at the center dash air outlet, and the airflow setting changed to “outside air.”~~

~~6.—**Vehicle and test activities.** The AC17 air conditioning test in an environmental test cell is composed of the following sequence of activities:~~

~~6.1—Drain and fill the vehicle's fuel tank to 40 percent capacity with test fuel. If a vehicle has gone through the drain and fuel sequence less than 72 hours previously and has remained under laboratory ambient temperature conditions, this drain and fill operation can be omitted (see §86.132-00(e)(2)(ii)).~~

~~6.2.1—Position the variable speed cooling fan in front of the test vehicle with the vehicle's hood down. This air flow should provide representative cooling at the front of the test vehicle (air conditioning condenser and engine) during the driving cycles. See §86.161-00(e) for a discussion of cooling fan specifications.~~

~~6.2.2—In the case of vehicles with rear engine compartments (or if this front location provides inadequate engine cooling), an additional cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 5300 cfm (2.50 m<sup>3</sup>/s). If, however, it can be demonstrated that during road operation the vehicle receives additional cooling, and that such additional cooling is needed to provide a representative test, the fan capacity may be increased or additional fans used if approved in advance by the Executive Officer.~~

~~6.3—Open all vehicle windows.~~

~~6.4—Connect the emission test sampling system to the vehicle's exhaust tail pipe(s).~~

~~6.5—Set the environmental test cell ambient test conditions to the conditions defined in paragraph (e) of this section, except that the solar heat shall be off.~~

~~6.6—Set the air conditioning system controls to off.~~

~~6.7—Start the vehicle (with air conditioning system off) and conduct a preconditioning EPA urban dynamometer driving cycle (§86.115).~~

~~6.7.1—If engine stalling should occur during any air conditioning test cycle operation, follow the provisions of §86.136-90 (Engine starting and restarting).~~

~~6.7.2—For manual transmission vehicles, the vehicle shall be shifted according the provisions of §86.128-00.~~



6.8—Following the preconditioning cycle, the test vehicle and cooling fan(s) are turned off, all windows are rolled up, and the vehicle is allowed to soak in the ambient conditions of paragraph (c)(1) of this section for  $30 \pm 1$  minutes. The solar heat system must be turned on and generating  $850 \text{ W/m}^2$  within 1 minute of turning the engine off.

6.9—**Air conditioning on test.**

6.9.1—Start engine (with air conditioning system also running). Fifteen seconds after the engine starts, place vehicle in gear.

6.9.2—Eighteen seconds after the engine starts, begin the initial vehicle acceleration of the SC03 driving schedule.

6.9.3—Operate the vehicle according to the SC03 driving schedule, as described in 40 CFR Part 86 Appendix I, paragraph (h), while sampling the exhaust gas.

6.9.4—At the end of the deceleration which is scheduled to occur at 594 seconds, simultaneously switch the sample flows from the SC03 bags and samples to the “HWFET” bags and samples, switch off gas flow measuring device No. 1, switch off the No. 1 petroleum fueled diesel hydrocarbon integrator, mark the petroleum fueled diesel hydrocarbon recorder chart, and start gas flow measuring device No. 2, and start the petroleum fueled diesel hydrocarbon integrator No. 2.

6.9.5—Allow the vehicle to idle for 14–16 seconds. Before the end of this idle period, record the measured roll or shaft revolutions and reset the counter or switch to a second counter. As soon as possible transfer the SC03 exhaust and dilution air samples to the analytical system and process the samples according to §86.140 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample collection phase of the test.

6.9.6—Operate the vehicle according to the HWFET driving schedule, as described in 40 CFR 600.109-08, while sampling the exhaust gas.

6.9.7—Turn the engine off 2 seconds after the end of the last deceleration.

6.9.8—Five seconds after the engine stops running, simultaneously turn off gas flow measuring device No. 2 and if applicable, turn off the petroleum fueled diesel hydrocarbon integrator No. 2, mark the hydrocarbon recorder chart, and position the sample selector valves to the “standby” position. Record the measured roll or shaft revolutions (both gas meter or flow measurement instrumentation readings), and re-set the counter. As soon as possible, transfer the HWFET exhaust and dilution air samples to the analytical system and process the samples according to §86.140, obtaining a stabilized reading of the exhaust bag sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample period.

6.10—**Air conditioning off test.** The air conditioning off test is identical to the steps identified in paragraphs 6.1 through 6.9 of this section, except that the air conditioning system and fan speeds are set to complete off or the lowest. It is preferred that the air conditioning off test be conducted sequentially after the air conditioning on test, following a 10–15 minute soak.

\* \* \* \*