

State of California
AIR RESOURCES BOARD

**CALIFORNIA EVAPORATIVE EMISSION STANDARDS AND TEST PROCEDURES
FOR 2001 AND SUBSEQUENT MODEL MOTOR VEHICLES**

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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 section 1976(c), title 13, California Code of Regulations (CCR). Additional requirements necessary to complete an application for certification of motor vehicles are contained in other documents that are designed to be used in conjunction with this document. These other documents include:

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4. ~~"California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes"~~ "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(h), title 13, CCR);

5. "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(h), title 13, CCR);

56. "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles" (incorporated by reference in section 1978(b), title 13, CCR);

67. "California Exhaust Emission Standards and Test Procedures for 1987 through 2003 Model Heavy-Duty Otto-Cycle Engines and Vehicles," as incorporated by reference in section 1956.8(d), title 13, CCR;

78. "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," as incorporated by reference in section 1956.8(d), title 13, CCR.

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CALIFORNIA EVAPORATIVE EMISSION STANDARDS AND TEST PROCEDURES FOR 2001 AND SUBSEQUENT MODEL MOTOR VEHICLES

The provisions of Title 40, Code of Federal Regulations (CFR), Part 86, Subparts A and B (as adopted or amended as of July 1, 1989); Subpart S (as adopted or amended on May 4, 1999); and, such sections of these Subparts as last amended on such other date set forth next to the 40 CFR Part 86 section title listed below, insofar as those subparts pertain to evaporative emission standards and test procedures, are hereby adopted as the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Years," with the following exceptions and additions:

PART I. GENERAL CERTIFICATION REQUIREMENTS FOR EVAPORATIVE EMISSIONS

A. 40 CFR §86.1801-01 Applicability

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1.2. For general certification purposes, and except as otherwise noted in these test procedures, the requirements set forth 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," the "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," the "California Exhaust Emission Standards and Test Procedures for 2005 – 2008 Model Zero-Emission Vehicles, and 2001 – 2008 Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes," ~~the "California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes,"~~ 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," 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," and the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," shall apply to light- and medium-duty vehicles; the "California Exhaust Emission Standards and Test Procedures for 1987 through 2003 Model Heavy-Duty Otto-Cycle Engines and Vehicles," and the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," shall apply to heavy-duty vehicles; and, section 1958, title 13, CCR shall apply to motorcycles.

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1.7 If a manufacturer opts to use 40 CFR Part 1066 per the migration schedule set forth in 40 CFR 86.101 (b), in lieu of 40 CFR Part 86, the California-specific 40 CFR Part 86 modifications contained herein shall still apply.

B. Definitions, Acronyms, Terminology

1. These test procedures incorporate by reference the definitions set forth 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,” the “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,” and the ~~“California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes,”~~ 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,” including the incorporated definitions from the Code of Federal Regulations. In addition, the following definitions apply:

1.1. “Non-integrated refueling canister-only system” means a subclass of a non-integrated refueling emission control system, where other non-refueling related evaporative emissions from the vehicle are stored in the fuel tank, instead of in a vapor storage unit(s).

1.2. “Sealed fuel system” means a non-liquid phase fuel system, on-board a vehicle, that stores, delivers, and meters the fuel under a very high pressure, and which inherently has no evaporative-related emissions, due to design specifications that eliminate the escape of any fuel vapors, under normal vehicle operations.

1.3. “2-gram breakthrough” means the point at which the cumulative quantity of hydrocarbons emitted from a stabilized canister vapor storage unit, during the loading process of the unit, is equal to 2 grams.

C. Useful Life

1. ~~§86.1805-0417 (February 19, 2015).~~ Delete. For vehicles certified to the emission standards in section I.E.1.(a), "useful life" shall have the same meaning as provided in section 2112, title 13, CCR. Except as provided below, for For vehicles certified to the emission standards in sections I.E.1.(c), I.E.1.(d), and I.E.1.(e), the "useful life" shall be 15 years or 150,000 miles, whichever first occurs. For 2016 and previous

model vehicles, 2017 and previous model vehicles >6,000 lbs. GVWR, and 2021 and previous model vehicles certified by a small volume manufacturer, the canister bleed standards are certification standards only.

D. General Standards; increase in emissions; unsafe conditions; waivers

1. Light- and Medium-Duty Vehicles.

1.1. Amend §86.1810-01 (~~December 8, 2005~~ February 19, 2015) as follows:

* * * *

2. Heavy-Duty Vehicles. Approval of heavy-duty vehicles over 14,000 lbs. GVWR and incomplete medium-duty vehicles shall be based on:

2.1. §1037.103 (c) (February 19, 2015) The provisions of this paragraph also apply to incomplete medium-duty vehicles.

2.2. Additional requirements for engineering evaluations and data submitted by the applicant: ~~an engineering evaluation of the system and data submitted by the applicant.~~ Engineering such evaluations may include successful public usage on light-duty or medium-duty vehicles, adequate capacity of storage containers, routing of lines to prevent siphoning, and other emissions-related factors deemed appropriate by the Executive Officer. For LPG systems, this engineering evaluation shall include: emissions from pressure relief valves, carburetion systems and other sources of leakage; emissions due to fuel system wear and aging, and evaporative emission test data from light-duty or medium-duty vehicles with comparable systems.

3. Auxiliary engines and fuel systems

3.1. §86.1813-17 (e) (February 19, 2015) [No change]

3.2. Except for 2017 model vehicles >6,000 lbs. GVWR and 2021 and previous model vehicles certified by a small volume manufacturer, 2017 and subsequent model vehicles equipped with an auxiliary engine shall be subject to these requirements.

E. Emission Standards

1. Evaporative Emission Standards for 2001 and Subsequent Model Year Vehicles Other Than Motorcycles.

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(e) For 2015 and subsequent model motor vehicles, the following evaporative emission requirements apply:

(i) A manufacturer must certify all vehicles subject to this section to the emission standards specified in either Option 1 or Option 2 below.

* * * *

(B) Option 2. The total hydrocarbon evaporative emissions from 2015 and subsequent model motor vehicles, tested in accordance with the test procedure sequence set forth in Part III, shall not exceed:

Vehicle Type	Hydrocarbon Emission Standards		
	Running Loss (grams per mile)	Highest Whole Vehicle Diurnal + Hot Soak ⁽¹⁾⁽²⁾⁽³⁾ (grams per test)	Canister Bleed ⁽⁴⁾ (grams per test)
Passenger Cars; and Light-Duty Trucks 6,000 lbs. GVWR and under, and 0 - 3,750 lbs. LVW	0.05	0.300	0.020
Light-Duty Trucks 6,000 lbs. GVWR and under, and 3,751 – 5,750 lbs. LVW	0.05	0.400	0.020
Light-Duty Trucks 6,001 - 8,500 lbs. GVWR; and Medium-Duty Passenger Vehicles	0.05	0.500	0.020
Medium-Duty Vehicles (8,501 - 14,000 lbs. GVWR); and Heavy-Duty Vehicles (over 14,000 lbs. GVWR)	0.05	0.600	0.030

- (1) The manufacturer shall determine compliance by selecting the highest whole vehicle diurnal plus hot soak emission value of the Three-Day Diurnal Plus Hot Soak Test and of the Two-Day Diurnal Plus Hot Soak Test.
- (2) Fleet-Average Option for the Highest Whole Vehicle Diurnal Plus Hot Soak Emission Standard Within Each Emission Standard Category. A manufacturer may optionally comply with the highest whole vehicle diurnal plus hot soak emission standards by using fleet-average hydrocarbon emission values. To participate, a manufacturer must utilize the fleet-average option for all of its emission standard categories and calculate a separate fleet-average hydrocarbon emission value for each emission standard category. The emission standard categories are as follows: (1) passenger cars and light-duty trucks 6,000 pounds GVWR and under, and 0 - 3,750 pounds LVW; (2) light-duty trucks 6,000 pounds GVWR and under, and 3,751 – 5,750 pounds LVW; (3) light-duty trucks 6,001 - 8,500 pounds GVWR and medium-duty passenger vehicles; and (4) medium-duty and

heavy-duty vehicles. The fleet-average hydrocarbon emission value for each emission standard category shall be calculated as follows:

$$\frac{\sum_{i=1}^n [(\text{number of vehicles in the evaporative family})_i \times (\text{family emission limit})_i]}{\sum_{i=1}^n (\text{number of vehicles in the evaporative family})_i}$$

where "n" = a manufacturer's total number of Option 2 certification evaporative families within an emission standard category for a given model year;

"number of vehicles in the evaporative family" = the number of vehicles produced and delivered for sale in California in the evaporative family;

"family emission limit" = the numerical value selected by the manufacturer for the evaporative family that serves as the emission standard for the evaporative family with respect to all testing, instead of the emission standard specified in this section I.E.1.(e)(i)(B). The family emission limit shall not exceed 0.500 grams per test for passenger cars; 0.650 grams per test for light duty trucks 6,000 pounds GVWR and under; 0.900 grams per test for light-duty trucks 6,001 - 8,500 pounds GVWR; and 1.000 grams for medium-duty passenger vehicles, medium-duty vehicles, and heavy-duty vehicles. In addition, the family emission limit shall be set in increments of 0.025 grams per test.

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(ii) Phase-In Schedule. For each model year, a manufacturer shall certify, at a minimum, the specified percentage of its vehicle fleet to the evaporative emission standards set forth in section I.E.1.(e)(i), according to the implementation schedule set forth below. For the purpose of this section I.E.1.(e)(ii), the manufacturer's vehicle fleet consists of the vehicles produced and delivered for sale by the manufacturer in California that are subject to the emission standards in section I.E.1.(e)(i). All 2015 through 2022 model motor vehicles that are not subject to these standards pursuant to the phase-in schedule shall comply with the requirements for 2004 through 2014 model motor vehicles, as described in section I.E.1.(d), or the optional zero-fuel evaporative emission standards for 2001 through 2014 model motor vehicles, as described in section I.E.1.(c).

<i>Model Years</i>	<i>Minimum Percentage of Vehicle Fleet</i> ⁽¹⁾⁽²⁾
2015, 2016, and 2017	Average of vehicles certified to section I.E.1.(c) in model years 2012, 2013, and 2014 ⁽³⁾⁽⁴⁾
2018 and 2019	60
2020 and 2021	80
2022 and subsequent	100

- (1) For the 2018 through 2022 model years only, a manufacturer may use an alternate phase-in schedule to comply with the phase-in requirements. An alternate phase-in schedule must achieve equivalent compliance volume by the end of the last model year of the scheduled phase-in (2022). The compliance volume is the number calculated by multiplying the percent of vehicles (based on the ~~manufacturer's projected sales volume of all vehicles~~ vehicles produced and delivered for sale by the manufacturer in California) meeting the new requirements in each model year by the number of years implemented prior to and including the last model year of the scheduled phase-in, then summing these yearly results to determine a cumulative total. The cumulative total of the five year (60/60/80/80/100) scheduled phase-in set forth above is calculated as follows: (60*5 years) + (60*4 years) + (80*3 years) + (80*2 years) + (100*1 year) = 1040. Accordingly, the required cumulative total for any alternate phase-in schedule of these emission standards is 1040. The Executive Officer shall consider acceptable any alternate phase-in schedule that results in an equal or larger cumulative total by the end of the last model year of the scheduled phase-in (2022).

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(iii) Carry-Over of 2014 Model-Year Evaporative Families Certified to the Zero-Fuel Evaporative Emission Standards. A manufacturer may carry over 2014 model motor vehicles certified to the zero-fuel (0.0 grams per test) evaporative emission standards set forth in section I.E.1.(c) through the 2019~~8~~ model year and be considered compliant with the requirements of section I.E.1.(e). For all motor vehicles that are certified via this carry-over provision, the emission standards set forth in section I.E.1.(c) shall apply when determining in-use compliance throughout the vehicle's useful life. If the manufacturer chooses to participate in the fleet-average option for the highest whole vehicle diurnal plus hot soak emission standard, the following family emission limits are assigned to these evaporative families for the calculation of the manufacturer's fleet-average hydrocarbon emission value.

Vehicle Type	Highest Whole Vehicle Diurnal + Hot Soak (grams per test)
Passenger Cars	0.300
Light-Duty Trucks 6,000 lbs. GVWR and under, and 0 - 3,750 lbs. LVW	0.300
Light-Duty Trucks 6,000 lbs. GVWR and under, and 3,751 – 5,750 lbs. LVW	0.400
Light-Duty Trucks 6,001 - 8,500 lbs. GVWR	0.500

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(v) Optional Certification for 2014 Model Motor Vehicles. A manufacturer may optionally certify its 2014 model motor vehicles to the evaporative emission standards set forth in section I.E.1.(e)(i), using the test fuel specified in section III.F.2.

(vi) Effective leak diameter standard and procedure

(A) Manufacturers shall demonstrate that for 2018 and subsequent model vehicles ≤14,000 lbs. GVWR certifying to the evaporative emission standards set forth in 1976(b)(1)(G), fuel systems do not exceed an effective leak diameter of 0.02 inches when tested in accordance with the test procedure sequence set forth in Part III of these test procedures. This requirement does not apply to 2021 and previous model vehicles certified by a small volume manufacturer. For vehicles with fuel tanks exceeding 25 gallons nominal fuel tank capacity, manufacturers may request approval from the Executive Officer for a leak standard greater than 0.020 inches, up to a maximum value of 0.040 inches.

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PART II. DURABILITY DEMONSTRATION

A. Light- and Medium-Duty Vehicles

1. Evaporative/refueling emission family determination.
§86.1821-01 (April 28, 2014) [No change.]

2. Durability Demonstration Procedures for Evaporative Emissions

2.1. §86.1824-01 Amend as follows:

- (a) and (b) Delete.
- (c) [No change.]
- (d) Delete.
- (e) ~~[No change.]~~ Amend to read: *In-use verification and In-use confirmatory testing.* The durability program must meet the requirements of §86.1845-04 (February 19, 2015) and §86.1846-01 (April 28, 2014).

2.2. For all passenger cars, light-duty trucks and chassis-certified medium-duty vehicles subject to the standards specified in section I.E. of these test procedures, demonstration of system durability and determination of three-day diurnal plus hot soak, two-day diurnal plus hot soak, and running loss emission deterioration factors ("evaporative DFs") for each evaporative/refueling family shall be based on tests of representative vehicles and/or systems. For purposes of evaporative emission durability testing, a representative vehicle is one which, with the possible exception of the engine and drivetrain, was built at least three months prior to the commencement of evaporative emission testing, or is one which the manufacturer demonstrates has stabilized non-fuel-related evaporative emissions.

2.3. Prior to commencement of a durability program, the manufacturer shall propose a method for durability testing and for determination of evaporative DFs for each evaporative/refueling family. The 4,000 and full useful life mile test points (or their equivalent) used in determining a DF must be within the standards of section I.E. or data will not be acceptable for use in the calculation of a DF, except for the following provision. For evaporative families certified to the emission standards in section I.E.(e)(i)(B) that utilize the fleet-average option, the 4,000 and full useful life mile test points for the highest whole vehicle diurnal plus hot soak emissions may exceed the emission standards of section I.E.(e)(i)(B) but must be less than the maximum allowed family emission limits set forth in footnote (2) of the table in section I.E.(e)(i)(B). A manufacturer is not required to obtain a new approval to use a previously approved evaporative emission durability procedure. The Executive Officer shall review the method, and shall approve it if it meets the following requirements:

2.3.1. The method must cycle and test the complete evaporative emission control system for the equivalent of the applicable vehicle useful life (i.e., ~~100,000, 120,000,~~ or 150,000 miles) of typical customer use.

* * * *

2.6. The fuel used for durability mileage accumulation and component aging shall be the fuel set forth in §86.1824-08 (f)(1) (April 28, 2014).

2.7. Manufacturers are not required to establish deterioration factors for canister bleed emissions.

3. Assigned DFs

3.1. §86.1826-01 (April 28, 2014). [No change.]

3.2. A small volume manufacturer, as defined in section 1900(b), title 13, CCR, may request to certify evaporative/refueling families using assigned DFs.

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4. Emission Data Vehicle Selection

4.1. §86.1828-01 (April 28, 2014) [No change.]

4.2. In selecting medium-duty test vehicles, the Executive Officer shall consider the availability of test data from comparably equipped light-duty vehicles and the size of medium-duty vehicles as it relates to the practicability of evaporative emission testing.

5. Durability and Emission Testing Requirements; waivers

5.1. §86.1829-01 (~~December 8, 2005~~ April 28, 2014). [No change, except as otherwise noted. Changes to items related to refueling testing are contained in the “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles”]

* * * *

5.4.1. This capability shall be demonstrated through compliance with the supplemental two-day diurnal plus hot soak emission standard, using the test sequence as specified in section III.D.3.1.18., except that the battery state-of-charge setting prior to the standard three-phase exhaust test shall be at the lowest level allowed by the manufacturer in order to maximize the cumulative amount of the auxiliary power unit activation during the three-phase exhaust test. Performance of this demonstration shall be in addition to the demonstration of compliance with the supplemental two-day diurnal plus hot soak emission standard required under section I.E.1., using the test sequence specified in section III.D.3.1.18.

* * * *

5.5. §86.1829-15(e) (February 19, 2015) [Amend as follows].

(1) and (2) See the “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles”

(3) [No change]

(4) [No change]

(5) See the “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles”

(6) [No change]

(7) Delete

(8) Delete

(9) See the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles"

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PART III. EVAPORATIVE EMISSION TEST PROCEDURES FOR LIGHT- AND MEDIUM-DUTY VEHICLES

A. Instrumentation

The instrumentation necessary to perform evaporative emission testing is described in 40 CFR 86.107-90. The following language is applicable in lieu of 40 CFR §86.107-90(a)(1):

* * * *

2. Running Loss Measurement Facility

2.1. For all types of running loss measurement test facilities, the following shall apply:

2.1.1. The measurement of vehicle running loss fuel vapor emissions shall be conducted in a test facility which is maintained at a nominal ambient temperature of 105.0°F. Manufacturers have the option to perform running loss testing in either an enclosure incorporating atmospheric sampling equipment, or in a cell utilizing point source sampling equipment. Confirmatory testing or in-use compliance testing may be conducted by the Executive Officer using either sampling procedure. The test facility shall have space for personnel access to all sides of the vehicle and shall be equipped with the following test equipment:

-A chassis dynamometer which meets the requirements of 40 CFR §86.108-00 or 40 CFR §1066.210 (April 28, 2014), with the following addition to ~~§86.108-00(d)~~:

Another dynamometer configuration may be used for running loss testing if approved in advance by the Executive Officer based on a demonstration that measured running loss emissions are equivalent to the emissions using the single-roll electric dynamometer described in 86.108-00(b)(2) or in 1066.210 (April 28, 2014).

* * * *

B. Calibrations

1. Evaporative emission enclosure calibrations are specified in 40 CFR §86.117-90. For the purposes of this section III.B, methanol shall mean ethanol when testing with ethanol-containing fuel. Methanol measurements may be omitted when methanol-fueled vehicles will not be tested in the evaporative enclosure. Amend 40 CFR §86.117-90 to include an additional section III.B.1.1., to read:

1.1. Diurnal evaporative emission enclosure. The diurnal evaporative emission measurement enclosure calibration consists of the following parts: initial and periodic determination of enclosure background emissions, initial determination of enclosure volume, and periodic hydrocarbon (HC) and methanol retention check and calibration. Calibration for HC and methanol may be conducted in the same test run or in sequential test runs.

* * * *

1.1.3. The HC and methanol measurement and retention checks shall evaluate the accuracy of enclosure HC and methanol mass measurements and the ability of the enclosure to retain trapped HC and methanol. The check shall be conducted over a 24-hour period with all of the normally functioning subsystems of the enclosure active. A known mass of propane and/or methanol shall be injected into the enclosure and an initial enclosure mass measurement(s) shall be made. The enclosure shall be subjected to the temperature cycling specified in section III.D.10.3.7. of these procedures (revising 40 CFR §86.133-90(I)) for a 24 hour period. The temperature cycle shall begin at 105°F (hour 11) and continue according to the schedule until a full 24-hour cycle is completed. A final enclosure mass measurement(s) shall be made. The following procedure shall be performed prior to the introduction of the enclosure into service and following any modifications or repairs to the enclosure that may impact the integrity of this enclosure; otherwise, the following procedure shall be performed on a monthly basis. (If six consecutive monthly retention checks are successfully completed without corrective action, the following procedure may be determined quarterly thereafter as long as no corrective action is required.)

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1.1.3.5. Inject into the enclosure a known quantity of propane between 0.5 to 1.0 ~~2 to 6~~ grams and/or a known quantity of methanol in gaseous form between 0.5 to 1.0 ~~2 to 6~~ grams. ~~For evaporative emission enclosures that will be used for testing motor vehicles certified to the reduced evaporative standards in sections I.E.1.(c) and (d), use a known amount of propane or gaseous methanol between 0.5 to 1.0 grams.~~ The injection method shall use a critical flow orifice to meter the propane and/or methanol at a measured temperature and pressure for a measured time period. Techniques which provide an accuracy and precision of ± 0.5 percent of the injected mass are also acceptable. Allow the enclosure internal HC and/or methanol concentration to mix and stabilize for up to 300 seconds. Measure the enclosure HC concentration (C_{HCe2}) and/or the enclosure methanol concentration ($C_{CH_3OH_2}$). For fixed volume enclosures, measure the temperature (T_2) and pressure in the enclosure (P_2). On variable volume enclosures,

unlatch the enclosure. On fixed volume enclosures, open the outlet and inlet flow streams. Start the temperature cycling function of the enclosure air mixing and temperature control system. These steps shall be completed within 900 seconds of sealing the enclosure.

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1.2. The running loss equipment shall be calibrated as follows:

1.2.1. The chassis dynamometer shall be calibrated according to the requirements of 40 CFR §86.118-78 or 40 CFR §1066.215 (April 28, 2014). The calibration shall be conducted at a typical ambient temperature of 75°F ± 5°F.

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C. Road Load Power, Test Weight, Inertia Weight Class, and Running Loss Fuel Tank Temperature Profile Determination

Amend 40 CFR §86.129-80 to include an additional section III.C.1. to read:

1. Determination of running loss test fuel tank temperature profile. The manufacturer shall establish for each combination of vehicle platform/powertrain/fuel tank submitted for certification a representative profile of fuel tank liquid and vapor temperature versus time to be used as the target temperature profile for the running loss evaporative emissions test drive cycle. If a vehicle has more than one fuel tank, a profile shall be established for each tank. If manufacturers use a vehicle model to develop a profile to represent multiple vehicle models, the vehicle model selected must have the greatest expected fuel liquid temperature and fuel vapor temperature increase during driving of all of the vehicle models it will represent. Manufacturers must select test vehicles with any available vehicle options that could increase fuel temperature during driving, such as any feature that limits underbody air flow. The profile shall be established by driving the vehicle on-road over the same driving schedule as is used for the running loss evaporative emissions test according to the following sequence:

* * * *

1.3. The vehicle fuel tank shall be drained and filled to 40 percent of the nominal tank capacity with fuel meeting the requirements of section III.D.1. of these procedures. For all hybrid electric vehicles, except for 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles, the battery state-of-charge shall be set at a level such that the auxiliary power unit would be activated by the vehicle's control strategy within 30 seconds of starting the first UDDS of the fuel tank temperature profile determination test sequence. If the auxiliary power unit is capable of being manually activated, the auxiliary power unit shall be manually activated at the beginning of and operating throughout the fuel tank temperature profile determination. For 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles, the battery state-of-charge shall be set at the level that results when the battery state-of-charge is initially set at the highest level allowed by the manufacturer and then decreased, as

applicable, by the performance of a standard three-phase exhaust test. The vehicle shall be moved to the location where the driving cycle is to be conducted. It may be driven a maximum distance of 5.0 miles, longer distances shall require that the vehicle be transported by other means. For 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles, the vehicle shall be either only pushed or towed to avoid disturbing the battery state-of-charge setting. The vehicle shall be parked for a minimum of 12 hours in an open area on a surface that is representative of the test road. The orientation of the front of the vehicle during parking (N, SW, etc.) shall be documented. Once the 12-hour minimum parking time has been achieved and the ambient temperature and weather conditions and track surface temperature are within the allowable ranges, the vehicle engine shall be started. The vehicle air conditioning system (if so equipped) shall be set as described in 40 CFR §1066.835 (February 19, 2015) ~~to the "NORMAL" air conditioning mode and adjusted to the minimum discharge air temperature and high fan speed. Vehicles equipped with automatic temperature controlled air conditioning systems shall be operated in "AUTOMATIC" temperature and fan modes with the system set at 72°F.~~ The vehicle may be operated at minimum throttle for periods up to 60 seconds prior to beginning the first UDDS cycle in order to move from the parking location onto the road surface. The driver's aid shall be started and the vehicle operated over one UDDS cycle, then two NYCCs, and another UDDS cycle. The end of each UDDS cycle and the end of the two NYCCs shall be followed by an idle period of 120 seconds during which the engine shall remain on with the vehicle in the same transmission range and clutch (if so equipped) actuation mode as specified in 40 CFR §86.128-79 (April 28, 2014) except for the following:

* * * *

1.5. The two UDDS and two NYCC driving traces shall be verified to meet the speed tolerance requirements of 40 CFR 86.115-78 (b)(1) (April 28, 2014), amended as follows:

* * * *

D. Test Procedure

The test sequence described in 40 CFR §86.130 through §86.140 shall be performed with the following modifications:

1. General Requirements

1.0. The following language shall be applicable in lieu of 40 CFR §86.130-78:

1.1. The test sequence shown in Figure 2 (Figure 3A or 3B for hybrid electric vehicles) describes the steps encountered as the vehicle undergoes the three-day diurnal sequence and the supplemental two-day diurnal sequence to determine conformity with the standards set forth. Methanol measurements may be omitted when methanol-fueled vehicles will not be tested in the evaporative enclosure. Ethanol shall be accounted for via measurement or mass adjustment factor, using the methods described in this test procedure, for vehicles tested with the gasoline containing 10 percent ethanol by

~~volume, set forth in part II, section A.100.3.1.2. of the “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.”~~ Ambient temperature levels encountered by the test vehicle throughout the entire duration of this test sequence shall not be less than 68°F nor more than 86°F, unless otherwise specified. The temperatures monitored during testing shall be representative of those experienced by the test vehicle. The test vehicle shall be approximately level during all phases of the test sequence to prevent abnormal fuel distribution. The temperature tolerance of a soak period may be waived for up to 10 minutes to allow purging of the enclosure or transporting the vehicle into the enclosure.

* * * *

1.3.2. For 2009 and subsequent model-year hybrid electric vehicles, a manufacturer may elect to perform the All-Electric Range Test separately from the test sequences specified under these evaporative emission test procedures, and pursuant to the ~~“California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes,”~~ 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.

* * * *

1.6.1. For a 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicle, the vehicle preconditioning drive shall include at least one complete UDDS performed entirely under a charge-sustaining mode of operation, The battery state-of-charge net change tolerance provisions specified in section ~~FG.10.~~, of the ~~“California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes”~~ 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” shall not apply.

1.7. For 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles that are equipped with non-integrated refueling canister-only systems, the following exceptions apply.

1.7.1. After completion of the vehicle preconditioning drive, the second fuel drain and tank refill step specified in 40 CFR §86.132-00(f)(1) shall be replaced by the 95% tank fill step specified in 40 CFR 86.153-98(d) (April 28, 2014).

1.7.2. After completion of the second fuel drain and tank refill step, the initial testing state of the canister shall be established by purging while performing either the chassis dynamometer procedure or the test track procedure, as described in subparagraphs (d)(1) and (d)(2) of 40 CFR 86.153-98 (April 28, 2014). For vehicles equipped with dual fuel tanks that can be individually selected or isolated, the required volume of fuel shall be driven out of one tank, the second tank shall be selected as the fuel source, and the required volume of fuel shall be driven out of the second tank. A manufacturer shall plan for interruptions in the vehicle drivedowns due to factors such as work schedules, driver relief, and test equipment considerations, using good engineering practice.

* * * *

1.7.4. Within 60 minutes of completing the vehicle drivedown, a third fuel drain and fill step shall be performed in which the fuel tank shall be filled to a prescribed tank fuel volume of 10 percent of the manufacturer's nominal fuel tank capacity, determined to the nearest one-tenth of a U.S. gallon (0.38 liter) with the specified fuel. The manufacturer may isolate the canister using any method that does not compromise the integrity of the system. A description of the canister isolation method shall be included in the manufacturer's certification application. When the refueling canister is isolated from its system, fuel vapors shall be allowed to be vented from the fuel tank, as appropriate, during this fill step.

1.7.4.1. In lieu of performing the drain and fill step specified in section III.D.1.7.4., the required tank volume of 10 percent may be established by using a measured drain of the fuel tank, within 60 minutes of completing the vehicle drivedown.

1.7.5 After completion of the third fuel drain and fill step, a second vehicle soak period of not less than 6 hours and not more than 24 hours shall be performed.

1.7.6. After completion of the second vehicle soak period, the fuel-tank-refill canister-loading step specified in section III.D.3.3.6. shall be performed.

1.7.7. After completion of the canister loading, a fourth drain and fill step shall be performed, as specified in section III.D.3.3.6.13.

1.7.8. After completion of the fourth drain and fill step, a third preconditioning soak period of not less than 12 hours and not more than 36 hours shall be performed.

1.7.9. After completion of the 12-to-36 hour preconditioning soak period, a test vehicle shall proceed to the exhaust emission test specified in section III.D.1.11. Exhaust emission sampling is not required during this step.

* * * *

1.12. For 2001 through 2008 model-year hybrid electric vehicles, a four-phase exhaust test shall be performed as shown in Figure 3A pursuant to the "California Exhaust Emission Standards and Test Procedures for 2005 – 2008 Model Zero-Emission Vehicles, and 2001 – 2008 Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes."

1.12.1. For 2009 and subsequent model-year hybrid electric vehicles, a manufacturer may elect to perform the four-phase exhaust emission test separately from the test sequence specified under these evaporative emission test procedures, and pursuant to the ~~"California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes."~~ 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.

* * * *

1.12.5. For 2009 and subsequent model-year hybrid electric vehicles, except for 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles, battery state-of-charge setting prior to the standard three-phase test shall be performed pursuant to the supplemental requirements specified in section ~~EF.6.1.5~~ of the ~~"California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes."~~ 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.

1.12.6. For 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles, battery state-of-charge setting prior to the standard three-phase test shall be at the highest level allowed by the manufacturer in order to eliminate or minimize the cumulative amount of the auxiliary power unit activation during either of the ensuing three-phase exhaust or running loss tests. This requirement shall be applicable regardless of a vehicle's ability to allow, or not to allow, manual activation of the auxiliary power unit. If off-vehicle charging is required to increase the battery state-of-charge for the proper setting, then this charging shall occur during the 12-to-36 hour soak period. The battery state-of-charge net change tolerance provisions specified in section ~~FG.10.~~, of the ~~"California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes"~~ 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” shall not apply.

* * * *

1.18. The supplemental two-day diurnal sequence in Figure 2 (and Figure 3A or 3B for hybrid electric vehicles) shall be conducted according to sections III.D.1.4. through III.D.1.17., with the following exceptions:

* * * *

1.18.5. For 2009 and subsequent model-year hybrid electric vehicles, except for 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles, battery state-of-charge setting prior to the standard three-phase test in the supplemental two-day diurnal test sequence shall be performed pursuant to the supplemental requirements specified in section ~~EF.6.1.5 of the “California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes.”~~ 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.

1.18.6. For 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles, battery state-of-charge setting prior to the standard three-phase exhaust test in the supplemental two-day diurnal sequence shall be at the highest level allowed by the manufacturer in order to eliminate or minimize the cumulative amount of the auxiliary power unit activation during either of the ensuing three-phase exhaust or running loss tests. This requirement shall be applicable regardless of a vehicle’s ability to allow, or not to allow, manual activation of the auxiliary power unit. If off-vehicle charging is required to increase the battery state-of-charge for the proper setting, then this charging shall occur during the 12-to-36 hour soak period. The battery state-of-charge net change tolerance provisions specified in section ~~FG.10., of the “California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes”~~ 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” shall not apply.

* * * *

3. Vehicle Preconditioning

3.1.1. For supplemental vehicle preconditioning requirements for 2001 through 2008 model-year hybrid electric vehicles, refer to the "California Exhaust Emission Standards and Test Procedures for 2005 – 2008 Model Zero-Emission Vehicles, and 2001 – 2008 Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes."

3.1.2. For supplemental vehicle preconditioning requirements for 2009 and subsequent model-year hybrid electric vehicles, refer to the ~~"California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes."~~ 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.

* * * *

3.3.6. After the soak period specified in section III.D.1.7.5., is completed, the canister for a 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicle equipped with a non-integrated refueling canister-only system shall be preconditioned and loaded according to the following steps. Prior to conducting the applicable test sequence, the canister shall have already achieved a stabilized state, such as is accomplished using the stabilization method described in section III.D.3.3.4. Good engineering practice and safety considerations, such as, but not limited to, adequate ventilation and appropriate electrical groundings, shall apply.

* * * *

3.3.6.8. The fuel nozzle shall be inserted into the fill pipe neck of the test vehicle, to its maximum penetration, and the refueling operation shall start. The plane of the nozzle's handle shall be approximately perpendicular to the floor. If using federal certification fuel: the fuel shall be dispensed at a temperature of 67°F ±3.0°F (19.4°C ±1.7°C), and at a dispensing rate of 9.8 gal/min ±0.3 gal/min (37.1 liter/min ±1.1 liter/min). If using California certification fuel: the fuel shall be dispensed at a temperature of 79°±1.5°F (26.1°±0.8°C), and at a dispensing rate of 9.8 ±0.3 gal/min (37.1 ±1.1 liter/min). When this refueling operation is conducted by the Executive Officer, a dispensing rate that is not less than 4.0 gal/min (15.1 liter/min) may be used.

* * * *

4. Dynamometer Procedure.

4.1. To be conducted according to 40 CFR §86.135-90 (~~December 8, 2005~~) (April 28, 2014).

* * * *

4.3. For 2009 and subsequent model-year hybrid electric vehicles, the dynamometer procedure shall be performed pursuant to the "~~California Exhaust Emission Standards and Test Procedures for 2009 Subsequent Model Zero-Emission Vehicles and Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes.~~" 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.

5. Engine Starting and Restarting.

5.1. Amend 40 CFR §86.136-90 to read as follows:

5.1.1. Revise subparagraph (c) to read: Except for hybrid electric vehicles, if the vehicle does not start after the manufacturer's recommended cranking time (or 10 continuous seconds in the absence of a manufacturer's recommendation), cranking shall cease for the period recommended by the manufacturer (or 10 seconds in the absence of a manufacturer's recommendation). This may be repeated for up to three start attempts. If the vehicle does not start after three attempts, the reason for failure to start shall be determined. The gas flow measuring device on the CVS (usually a revolution counter) or CFV shall be turned off and the sampler selector valves, including the alcohol sampler, placed in the "standby" position during this diagnostic period. In addition, either the CVS should be turned off, or the exhaust tube disconnected from the tailpipe during the diagnostic period. If failure to start is an operational error, the vehicle shall be rescheduled for testing from a cold start.

5.2 The engine starting and restarting provisions of 40 CFR §1066.415 (April 28, 2014) may be followed as an alternative to 40 CFR §86.136-90.

6. Dynamometer Test Run, Gaseous and Particulate Emissions.

6.1. To be conducted according to ~~40 CFR §86.137-90~~ 40 CFR §86.137-94 (April 28, 2014).

6.2. For 2001 through 2008 model-year hybrid electric vehicles, the dynamometer test run, gaseous and particulate emissions shall be performed pursuant to the "California Exhaust Emission Standards and Test Procedures for 2005 – 2008 Model Zero-Emission Vehicles, and 2001 – 2008 Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes."

6.3. For 2009 and subsequent model-year hybrid electric vehicles, the dynamometer test run, gaseous and particulate emissions shall be performed pursuant to the ~~"California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes."~~ 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. Vehicle Fuel Tank Temperature Stabilization

* * * *

7.3. The vehicle air conditioning system (if so equipped) shall be set as described in 40 CFR §1066.835 (February 19, 2015) ~~to the "NORMAL" air conditioning mode and adjusted to the minimum discharge air temperature and high fan speed. Vehicles equipped with automatic temperature controlled air conditioning systems shall be operated in "AUTOMATIC" temperature and fan modes with the system set at 72°F.~~

8. Running Loss Test

* * * *

8.1. If running loss testing is conducted using an enclosure which incorporates atmospheric sampling equipment, the manufacturer shall perform the following steps for each test:

* * * *

8.1.5. The fuel tank temperature sensor and the ambient temperature sensor shall be connected to the temperature recording system and, if required, to the air management and temperature controllers. The vehicle cooling fan shall be positioned as described in 40 CFR §86.135-90(b). During the running loss test, the cover of the vehicle engine compartment shall be closed as much as possible, windows shall be closed, and air conditioning system (if so equipped) shall be ~~operated according to the requirements of section III.C. (§86.129-80 (d)(3))~~ set as described in 40 CFR §1066.835 (February 19, 2015). Vehicle coolant temperature shall be monitored to ensure adequate vehicle coolant air to the radiator intake(s). The temperature recording system and the hydrocarbon and alcohol emission data recording system shall be started.

* * * *

8.1.8. The vehicle shall be driven through one UDDS, then two NYCCs and followed by one UDDS. Each UDDS and the NYCC driving trace shall be verified to meet

the speed tolerance requirements of 40 CFR §86.115-78 (b) (April 28, 2014) as modified by III.C. The end of each UDDS cycle and the two NYCCs shall be followed by an idle period of 120 seconds during which the engine shall remain on with the vehicle in the same transmission range and clutch (if so equipped) actuation mode as specified in §86.128-79 (April 28, 2014), modified by section III.C.1.3.

* * * *

8.2. If running loss testing is conducted using a cell which incorporates point source sampling equipment, the manufacturer shall perform the following steps for each test:

* * * *

8.2.2. The vehicle cooling fan shall be positioned as described in 40 CFR §86.135-90(b). During the running loss test, the cover of the vehicle engine compartment shall be closed as much as possible, windows shall be closed, and air conditioning system (if so equipped) shall be ~~operated according to the requirements of section III.C.1.3. (40 CFR §86.129-80)~~ set as described in 40 CFR §1066.835 (February 19, 2015). Vehicle coolant temperature shall be monitored to ensure adequate vehicle coolant air to the radiator intake(s).

8.2.3. The vehicle shall be operated on the dynamometer over one UDDS, two NYCCs, and one UDDS. Each UDDS and NYCC driving trace shall be verified to meet the speed tolerance requirements of 40 CFR §86.115-78 (b) (April 28, 2014) as modified by section III.C. Idle periods of 120 seconds shall be added to the end of each of the UDDS and to the end of the two NYCCs. The transmission may be operated according to the specifications of 40 CFR §86.128-79 (April 28, 2014) as modified by section III.C.1.3. Engine starting and restarting shall be conducted according to section III.D.8.1.9.

* * * *

8.2.9. The sample bags shall be analyzed within 20 minutes of their respective sample collection phases, as described in 40 CFR ~~§86.137-90(b)(15)~~ §86.137-94(b)(15) (April 28, 2014).

* * * *

9. Hot Soak Test

9.1. Amend the first paragraph of 40 CFR §86.138-90 as follows: For the three-day diurnal sequence, the hot soak evaporative emission test shall be conducted immediately following the running loss test. The hot soak test shall be performed at an ambient temperature of 105°F ± 10.0°F for the first 5 minutes of the test. The remainder of the hot soak test shall be performed at 105°F ± 5.0°F and ± 2.0°F on average.

9.2. Revise subparagraph (a) to read: If the hot soak test is conducted in the running loss enclosure, the final hydrocarbon and alcohol concentration for the running

loss test, calculated in section ~~III.D.11.3.1.(b)~~ III.D.11, shall be the initial hydrocarbon concentration (time = 0 minutes) C_{HCE1} and the initial alcohol concentration (time=0 minutes) C_{CH_3OHe1} , $C_{C_2H_5OHe1}$ for the hot soak test. If the vehicle must be transported to a different enclosure, sections III.D.9.3. through III.D.9.7., as modified below, shall be conducted.

9.3. Revise subparagraph (d) to include: Analyze the enclosure atmosphere for hydrocarbons and alcohol and record. This is the initial (time=0 minutes) hydrocarbon concentration, C_{HCE1} and the initial (time=0 minutes) alcohol concentration, C_{CH_3OHe1} , $C_{C_2H_5OHe1}$, required in section ~~III.D.11.3.1.(a)~~ III.D.11.

* * * *

10. Diurnal Breathing Loss Test

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10.3. Revise 40 CFR §86.133-90 to read as follows:

* * * *

10.3.9. Revise subparagraph (n) to read: The end of the first 24-hour cycle of the diurnal test occurs 24 hours \pm 2 minutes after the heat build begins. Analyze the enclosure atmosphere for hydrocarbons and alcohol and record. This is the final hydrocarbon concentration, C_{HCE2} , and the final alcohol concentration, C_{CH_3OHe2} , $C_{C_2H_5OHe2}$, in section ~~III.D.11.3.1.(e)~~ III.D.11 which modifies 40 CFR §86.143-90, for this test cycle. The time (or elapsed time) of this analysis shall be recorded. The procedure, commencing with subparagraph (k)(1) shall be repeated until three consecutive 24-hour tests are completed. The data from the test cycle yielding the highest diurnal hydrocarbon mass shall be used in evaporative emissions calculations as required by section ~~III.D.11.3.1.(e)~~ III.D.11 which modifies 40 CFR §86.143-90.

* * * *

11. Calculations: Evaporative Emissions

11.0. Revise 40 CFR §86.143-90 as follows:

* * * *

11.3. Revise subparagraph (a)(2) to read:

11.3.1. For hydrocarbons in an enclosure:

(a) Hot soak and diurnal testing in an enclosure: For fixed volume enclosures, the enclosure hydrocarbon mass is determined as:

* * * *

For vehicles tested in an enclosure with ~~the gasoline~~ containing 10 percent ethanol by volume set forth in part II, section A.100.3.1.2. of the “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” only, measured ethanol values can be omitted so long as the resultant M_{HC} is multiplied by 1.08. If this option is used, then all terms accounting for ethanol in the applicable equations of this section III.D.11 (including ethanol concentration values of the above equation) shall equal zero.

* * * *

(b) Running loss mass.

* * * *

For the point source method:

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For vehicles tested for running loss using the point source method with ~~the gasoline~~ containing 10 percent ethanol by volume set forth in part II, section A.100.3.1.2. of the “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” only, measured ethanol values can be omitted so long as the resultant $M_{HCrl(n)}$ is multiplied by 1.08. If this option is used, then all terms accounting for ethanol in the applicable equations of this section III.D.11 shall equal zero and both $C_{HCs(n)}$ and $C_{HCa(n)}$ in the above equation shall include the FID response to ethanol (the FID response to ethanol shall not be subtracted).

* * * *

12. Bleed Emission Test Procedure (BETP)

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12.2. Fuel Tank Drain/Fill and Soak. A fuel tank that represents the worst case as determined by engineering evaluation shall be drained and filled to 40 percent with the gasoline referenced in section III.D.12.1.1. The tank shall be soaked for a minimum of 6 hours to a maximum of 72 hours at $65 \pm 3^\circ\text{F}$. The canister system load (section III.D.12.3) and soak (section III.D.12.4) can be performed in series or in parallel with the 6 to 72 hour fuel tank soak.

* * * *

12.6. Connection of Carbon Canister System and Fuel Tank. The canister system load port shall be connected to the fuel tank vent port of the otherwise sealed fuel tank and soaked for a minimum of 12 hours and a maximum of 36 hours at $65 \pm 3^\circ\text{F}$. The canister system purge (engine) port shall be plugged for the remainder of the bleed emissions test.

12.7. Two-Day Diurnal Temperature Cycling. The fuel tank and canister system shall be cycled between 65°F and 105°F according to the two-day diurnal test in section III.D.10.15.

* * * *

13. Effective Leak Diameter Test

13.1 To be conducted according to 40 CFR §1066.985 (February 19, 2015).

* * * *

F. Fuel Specifications

1. For 2001 through 2014 model motor vehicles (except for 2014 model year vehicles certifying to the evaporative emission standards set forth in section I.E.1.(e)), the evaporative emission test fuel shall be the fuel specified for exhaust emission testing in part II. section A.100.3. 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," except as provided in section III.G. of these test procedures.

* * * *

G. Alternative Test Procedures

1. For vehicles that are required to be certified using the test fuel in section III.F.1., a manufacturer may alternatively demonstrate compliance with the applicable evaporative emission standards using a gasoline test fuel meeting the specifications set forth in 40 CFR §86.113-9404(a)(1) (February 19, 2015) 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 these test procedures.

2. For vehicles that are required to be certified using California gasoline test fuel, a manufacturer may alternatively demonstrate compliance with the applicable evaporative emission standards using a gasoline test fuel meeting the specifications set forth in 40 CFR §1065.710-15(b) (February 19, 2015) 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 these test procedures.

2.1. If gasoline test fuel meeting the specifications set forth in 40 CFR §1065.710-15(b) (February 19, 2015) is used in the Bleed Emission Test Procedure (BETP), then both the fuel tank soak set forth in section III.D.12.2 and the fuel tank/canister assembly soak set forth in section III.D.12.6 shall occur at $72 \pm 3^{\circ}\text{F}$, and the diurnal temperature profile shall be as specified in 40 CFR Appendix II. Otherwise, the BETP procedure, as specified in these test procedures, shall be used.

23. Manufacturers may use an alternative set of test procedures to demonstrate compliance with the standards set forth in section I.E. of these test procedures with advance Executive Officer approval if the alternative procedure is demonstrated to yield test results equivalent to, or more stringent than, those resulting from the use of the test procedures set forth in section III.D. of these test procedures.

34. If the manufacturer uses for certification a test procedure other than section III.D., the Executive Officer has the option to conduct confirmatory and in-use compliance testing with the test procedures set forth in section III.D. of this California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.

* * * *