ATTACHMENT A-6

State of California
AIR RESOURCES BOARD

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

Adopted:	August 5, 1999
Amended:	September 5, 2003
Amended:	June 22, 2006
Amended:	October 17, 2007
Amended:	December 2, 2009
Amended:	September 27, 2010
Amended:	March 22, 2012

Note: Proposed amendments to this document are shown in underline to indicate additions and ~~strikeouts~~ to indicate deletions compared to the test procedures as last amended September 27, 2010.

NOTE: This document is incorporated by reference in section 1978(b), 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:

1. "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures ~~for 2001 and Subsequent~~ and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles" (incorporated by reference in section 1961(d), title 13, CCR).

2. "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" (incorporated by reference in section 1961.2 (d), title 13, CCR).

3~~2~~. "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" (incorporated by reference in section 1962.1(h), title 13, CCR).

4~~3~~. "California Evaporative Emission Standards and Test Procedures ~~For~~for 2001 and Subsequent Model Motor Vehicles" (incorporated by reference in section 1976(c), title 13, CCR).

5~~4~~. "Malfunction and Diagnostic System Requirements – 1994 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines" (incorporated by reference in section 1968.1, title 13, CCR).

6~~5~~. "Malfunction and Diagnostic System Requirements – 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines" (incorporated by reference in section 1968.2, title 13, CCR).

7~~6~~. "Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks" (incorporated by reference in section 2235, title 13, CCR).

CALIFORNIA REFUELING 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 B (as adopted or amended by the U.S. Environmental Protection Agency (U.S. EPA) on the date listed) and S (as adopted on May 4, 1999, or as last amended on such other date set forth next to the 40 CFR Part 86 section title listed below) to the extent they pertain to the testing and compliance of vehicle refueling emissions for passenger cars, light-duty trucks and medium-duty vehicles, are hereby adopted as the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," with the following exceptions and additions.

Subpart S Requirements

I. General Certification Requirements for Refueling Emissions

A. Applicability

1. These refueling standards and test procedures are applicable to all new 2001 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, natural gas-fueled, and hybrid electric passenger cars (including 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles), light-duty trucks and medium-duty vehicles with a gross vehicle weight rating of less than 8,501 lbs., and to all new complete 2015 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, natural gas-fueled, and hybrid electric (including 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles) medium-duty vehicles with a gross vehicle weight rating of 8,501 through 14,000 lbs. A manufacturer may elect to certify 2009 through 2011 model-year off-vehicle charge capable hybrid electric vehicles using these provisions. In cases where a provision applies only to a certain vehicle group based on its model year, vehicle class, motor fuel, engine type, or other distinguishing characteristics, the limited applicability is cited in the appropriate section or paragraph.

2. For general certification purposes, the requirements set forth in the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures ~~for 2001 and Subsequent~~ 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 2009 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 Evaporative Emission Standards and Test Procedures For 2001 and Subsequent Model Motor Vehicles," shall apply, except as otherwise noted in these test procedures.

3. Reference to vehicle sales throughout the United States shall mean vehicle sales in California, except when certifying to the refueling standards, in which case, vehicle sales shall mean throughout the United States.

4. A small volume manufacturer is defined as any vehicle manufacturer with California actual sales less than or equal to 4,500 new vehicles per model year based on the average number of vehicles sold by the manufacturer in the previous three consecutive years.

5. Regulations concerning U.S. EPA hearings, inspections, specific language on the Certificate of Conformity, alternative useful life, and selective enforcement audit shall not be applicable to these procedures, except where specifically noted.

6. In those instances where testing conditions or parameters are not practical or feasible for vehicles certified to the refueling standards, the manufacturer shall provide a test plan that provides equal or greater confidence in comparison to these test refueling procedures. The test plan must be approved in advance by the Executive Officer.

7. The term “[no change]” means that these test procedures do not modify the applicable federal requirement.

8. The specifications for the fuel used in testing are set forth in 40 CFR §86.113-94 [February 18, 2000]. Alternatively, California certification fuel specified in Part II, A.100.3.1.2 (test fuel with 10 percent ethanol) 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” may be used for 2015 and subsequent model vehicles ~~is not allowed~~ for certification or in-use testing as long as California temperatures are applied as described in Subpart B, section II.B.5.2.

B. Definitions, Acronyms, Terminology

1. These test procedures incorporate by reference the definitions set forth in the Code of Federal Regulations; and, the definitions as set forth in the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures ~~for 2001 and Subsequent~~ 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,” in 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," and in the "California Evaporative Emission Standards and Test Procedures For 2001 and Subsequent Model Motor Vehicles."

C. Useful Life

1. Delete §86.1805-01; §86.1805-04 and replace with:

"Useful life" shall have the same meaning as provided in title 13, CCR, §2112.

D. On-Board Diagnostics

1. Delete §86.1806 and replace with:

The applicable sections of the "Malfunction and Diagnostic System Requirements – 1994 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines," as set forth in title 13, CCR, section 1968.1; and, the "Malfunction and Diagnostic System Requirements – 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines," as set forth in title 13, CCR, section 1968.2, are hereby incorporated by reference into this test procedure. For purposes of this test procedure, all references to evaporative system monitoring, malfunction criteria, and MIL illumination and fault code storage shall also apply to refueling systems.

E. General Standards, increase in emissions; unsafe conditions; waivers

1. Amend §86.1810-01 [July 12, 2001] as follows:

1.1. (a) through (j). [See the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures ~~for 2001 and Subsequent~~ 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;" or the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles."]

1.2. (k) [No change.]

1.3. (l) Substitute certification to the applicable refueling emission standards set forth in section I.I.F. of these test procedures instead of with the standards set forth in §86.1811-04(e); §86.1812-01(e); §86.1813-01(e); and, §86.1816-05(e).

1.4. (m) Substitute compliance with applicable refueling emission standards set forth in section I.I.F. of these test procedures instead of with the standards set forth in §86.1811-04(e); §86.1812-01(e); §86.1813-01(e); and, §86.1816-05(e).

1.5. (n) [No change.]

1.6. (o) and (p) [See the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures ~~for 2001 and Subsequent~~ and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," and 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."]

1.7. A manufacturer must demonstrate compliance with the fuel spillage test requirements in the "Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks," which is hereby incorporated by reference herein.

2. In addition to the provisions set forth in these test procedures, the ARB reserves the authority to require testing to enforce compliance and to prevent noncompliance with the refueling emission standard.

3. Vehicles certified to the refueling emission standards set forth in Section I.F.2.2. below, shall not be counted in the phase-in sales percentage compliance determinations.

F. Emission Standards

1. Delete 40 CFR §§86.1811 through 86.1816 (all years).

2. The maximum refueling emissions for 2001 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles with a gross vehicle weight rating less than 8,501 lbs., and 2015 and subsequent model complete medium-duty vehicles with a gross vehicle weight rating 8,501 through 14,000 lbs. for the full useful life are:

2.1. For gasoline-fueled, alcohol-fueled, diesel-fueled, fuel-flexible, and hybrid electric vehicles: 0.20 grams hydrocarbons per gallon of fuel dispensed. [For purposes of these test procedures, hydrocarbons shall mean organic material hydrocarbon equivalent for alcohol-fueled vehicles.] For liquefied petroleum gas-fueled vehicles: 0.15 grams hydrocarbons per gallon of fuel dispensed.

2.2. Vehicles powered by diesel fuel are not required to conduct testing to demonstrate compliance with the refueling emission standards set forth above, provided that all of the following provisions are met:

(A) The manufacturer can attest to the following evaluation: "Due to the low vapor pressure of diesel fuel and the vehicle tank temperatures, hydrocarbon vapor concentrations are low and the vehicle meets the 0.20 grams/gallon refueling emission standard without a control system."

(B) The certification requirement described in section I.F.2.2.(A) is provided in writing and applies for the full useful life of the vehicle.

2.3. Incomplete vehicles of 14,000 pounds gross vehicle weight rating or less that are certified as incomplete vehicles for the purposes of evaporative

emissions testing as set forth in the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles,” are not required to demonstrate compliance with the refueling emission standards set forth in 2.1.

G. Durability Demonstration procedures for refueling emissions.

~~1.~~ §86.1825-01 Durability Demonstration procedures for refueling emissions [October 6, 2000] [No change.] ~~Amend as follows: Add the following sentences to the first paragraph:~~

~~2.~~

As amended: March 22, 2012
Board Hearing: January 26-27, 2012

Subpart B - Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles and New Light-Duty Trucks; Test Procedures

40 CFR §§ 86.101 through 86.145 and Appendix I (UDDS Schedule) of this Subpart B, as incorporated by reference and amended in the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures ~~for 2001 and Subsequent~~ 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 2009 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 Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," are hereby incorporated by reference herein.

II. Refueling Emissions Test Procedures

A. Fuel Spitback Emissions

1. §86.146-96 Fuel dispensing spitback procedure [August 23, 1995] [No change.]

B. Refueling Emissions

1. §86.150-98 Refueling test procedure; overview [September 21, 1994]

1.1. Revise subparagraph (a), first sentence, as follows: The refueling emissions test procedure described in this and subsequent sections is used to determine the conformity of vehicles with the refueling emissions standards set forth in section I.F. of these test procedures for all of the vehicle types specified in section I.A.

2. §86.151-98 General requirements; refueling test [April 6, 1994]

2.1. Revise subparagraph (a), first sentence, as follows: The refueling emissions procedure, shown in Figure B98-12, starts with the stabilizing of the vehicle and the loading of the refueling emissions canister(s) and continues with the vehicle drive for purging of the canister, followed by the refueling emissions measurement.

3. §86.152-98 Vehicle preparation; refueling test [December 8, 2005]

3.1. Amend subparagraph (a) to include: For 2012 and subsequent off-vehicle charge capable hybrid electric vehicles equipped with nonintegrated refueling canister-only systems, the refueling canister shall not be removed from the vehicle.

3.2. Subparagraph (b) [No change.]

3.3. Subparagraph (c) [No change.]

4. §86.153-98 Vehicle and canister preconditioning; refueling test [December 8, 2005]

4.1. Amend subparagraph (a) to include: The vehicle preconditioning drive for 2012 and later model-year off-vehicle charge capable hybrid electric vehicles 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 F.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" shall not apply.

4.1.1. Add subparagraph (a)(1): 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles equipped with non-integrated refueling canister-only systems. Such vehicles and vapor storage canisters shall be preconditioned in accordance with the preconditioning procedures for the two-diurnal evaporative emissions test specified in 40 CFR 86.132-96(a) through (j), with the following exceptions.

4.1.2. Prior to conducting the applicable test sequence, the nonintegrated refueling canister shall have already achieved a stabilized state, such as is accomplished using the stabilization method described in section III.D.3.3.4, of the "California Evaporative Emission Standards and Test Procedures ~~For~~for 2001 and Subsequent Model Motor Vehicles." Within 60 minutes of completing the vehicle preconditioning drive, a second fuel drain and fill step shall be performed, The fuel tank shall be filled to the prescribed tank fuel volume of 95 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.

4.1.3. After the second fuel drain and tank refill step is completed, the initial testing state of the canister shall be established by purging while performing vehicle driving, using 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. 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.

4.1.3.1. The vehicle drivedown will consume 85%, or less as determined by the manufacturer, of the manufacturers' nominal fuel tank capacity,

4.1.3.2. In order to reduce the amount of time required to consume 85 percent of the fuel tank capacity, as required by either subparagraph (d)(1) or (d)(2) in 40 CFR 86.153-98, as applicable, a manufacturer may elect to set the battery state-of- charge at a level that maximizes the amount of engine operation, prior to conducting either the chassis dynamometer or the test track driving procedure, as applicable.

4.1.3.3. With advance Executive Officer approval, a manufacturer may optionally elect to bench purge the canister either during the initial soak period,

specified in 40 CFR §86.132-96(c)(1), or after the vehicle preconditioning drive step specified in section II.B.4.1., in lieu of performing the second fuel drain/fill and vehicle drivedown steps specified in sections II.B.4.1.2. and II.B.4.1.3. Approval by the Executive Officer shall be based upon assurance that the canister will be bench purged by an equivalent volume of air corresponding to a consumption of 85%, or less as determined by the manufacturer, of the manufacturers' nominal fuel tank capacity, and that the characteristics of the purge flow through the canister, such as flow rates, shall be representative of flow that occurs under the specified vehicle drivedown UDDS cycles. Within 60 minutes of completing the bench purging, the fuel drain and fill step specified in section II.B.4.1.4., shall be performed.

4.1.4. 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.

4.1.5. In lieu of performing the third fuel drain and fill step specified in section II.B.4.1.4., the required fuel 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.

4.1.6. Fuel-tank-refill canister loading. Good engineering practice and safety considerations, such as, but not limited to, adequate ventilation and appropriate electrical groundings, shall apply.

4.1.7. The test vehicle shall be allowed to soak for a minimum of 6 hours and a maximum of 24 hours, at 80ºF ±3ºF (27ºC ±1.7ºC), prior to starting the fuel-tank-fill canister-loading step.

4.1.7.1. Off-vehicle charging to increase the battery state-of-charge to the highest level allowed by the manufacturer, prior to either the chassis dynamometer or the test track driving procedures specified in section II.B.4.4., shall occur during the soak period specified in section II.B.4.1.7.

4.1.8. The refueling canister shall not be isolated from its system during the fuel-tank-refill canister-loading step.

4.1.9. The test vehicle's fuel fill pipe cap shall be removed

4.1.10. The dispensed fuel temperature recording system shall be started.

4.1.11. The fuel nozzle shall be inserted into the fill pipe neck of the test vehicle, to its maximum penetration, and the tank refueling operation shall start. The plane of the nozzle's handle shall be approximately perpendicular to the floor. The fuel shall be dispensed at a temperature of 67ºF ±3.0ºF (19.4ºC ±1.7ºC), and at a dispensing rate of 9.8 gal/min ±0.3 gal/min (37.1 liter/min ±1.1 liter/min). <u>If using California certification fuel, the fuel shall be dispensed at a temperature of 79±1.5 ºF (26.1±0.8 ºC) and at a dispensing rate of 9.8±0.3 gal/min (37.1±1.1 liter/min).</u> 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.

4.1.12. The fuel flow shall continue until the refueling nozzle automatic shut-off is activated. The amount of fuel dispensed must be at least 85 percent of the nominal fuel tank volume, determined to the nearest one-tenth of a U.S. gallon (0.38 liter). If an automatic nozzle shut-off occurs prior to this point, the dispensing shall be reactivated within 15 seconds, and fuel dispensing continued as needed. A minimum of 3 seconds shall elapse between any automatic nozzle shutoff and the subsequent resumption of fuel dispensing.

4.1.13. As soon as possible after completing the refilling step, remove the fuel nozzle from the fill pipe neck, and replace the test vehicle's fuel fill pipe cap.

4.1.14. The refueling canister shall be isolated from its system as soon as possible after completing the refilling step.

4.1.15. For vehicles equipped with more than one fuel tank, the steps described in this section shall be performed for each fuel tank.

4.1.16. When the fuel-tank-refill canister-loading operation is completed, the test vehicle shall proceed to the non-integrated system canister purging procedures specified in section II.B.4.4. The canister shall not be isolated from its system during these canister-purging procedures.

4.1.17. The Executive Officer may approve minor modifications to this canister-~~-~~loading method when such modifications are supported by good engineering judgment, and do not reduce the stringency of the method.

4.2. Subparagraph (b) [No change.]

4.3. Subparagraph (c), amend subparagraph (c)(1) to include: A 2012 and later model-year off-vehicle charge capable hybrid electric vehicle that is tested either for exhaust emissions only or for refueling emissions, shall be processed in accordance with the provisions of section F, 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," with the following exceptions.

4.3.1. For such vehicles, the battery state-of-charge setting prior to the cold start exhaust test shall be at the highest level allowed by the manufacturer. 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 canister preconditioning process.

4.3.2. The battery state-of-charge net change tolerance provisions specified in section F.10., of the "California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, ~~In The~~in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes" shall not apply.

4.4. Amend subparagraph (d) as follows: Canister purging: nonintegrated systems. For all vehicles, except for 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles equipped with non-integrated refueling canister-only systems, within one hour of completion of canister loading to

breakthrough, the fuel tank(s) shall be further filled to 95 percent of nominal tank capacity determined to the nearest one-tenth of a U.S. gallon (0.38 liter) with the fuel specified in Sec. 86.113-94. During this fueling operation, the refueling emissions canister(s) shall be disconnected, unless the manufacturer specifies that the canister(s) should not be disconnected. Following completion of refueling, the refueling emissions canister(s) shall be reconnected, if the canister was disconnected during refueling. Special care shall be taken during this step to avoid damage to the components and the integrity of the fuel system. For all vehicles, including 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles equipped with non-integrated refueling canister-only systems, vehicle driving to purge the refueling canister(s) shall be performed using either the chassis dynamometer procedure or the test track procedure, as described in subparagraphs (d)(1) and (d)(2) of 40 CFR 86.153-9. The Executive Officer may choose to shorten the vehicle driving for a partial refueling test as described in subparagraph (d)(3) of 40 CFR 86.153-98. 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.

4.4.1. A 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicle shall be processed in accordance with the provisions of section F 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,” with the following exception.

4.4.2. For such vehicles, the battery state-of-charge setting prior to either the chassis dynamometer or the test track driving procedures, as applicable, shall be at the highest level allowed by the manufacturer. 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 soak period specified in section II.B.4.1.7., for 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles equipped with non-integrated refueling canister-only systems, and during the canister preconditioning process for all other hybrid electric vehicles.

4.4.2.1. In order to reduce the amount of time required to consume 85 percent of the fuel tank capacity, as required by either subparagraph (d)(1) or (d)(2) in 40 CFR 86.153-98, as applicable, a manufacturer may elect to set the battery state-of-‑charge at a level that is less than specified in section II.B.4.4.2., prior to conducting either the chassis dynamometer or the test track driving procedure, as applicable. Such an election shall be allowed by the Executive Officer unless information, such as in-use test results, or other applicable information that may become available, indicates that such an election compromises the stringency of the test procedures.

4.4.3. The battery state-of-charge net change tolerance provisions specified in section F.10., of the “California Exhaust Emission Standards and Test

Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, ~~In~~in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes" shall not apply.

4.4.4. The Executive Officer may use any of the following battery state-of-charge levels for purposes of either certification confirmatory or in-use compliance testing of such vehicles,

4.4.5. As specified in section II.B.4.4.2.

4.4.6. If applicable, at the level approved under section II.B.4.4.2.1.

4.4.7. If applicable, at any level in-between the levels indicated by sections II.B.4.4.2. and II.B.4.4.2.1.

4.4.8. In lieu of performing the vehicle drivedown step specified in section II.B.4.4., a manufacturer may, with advance Executive Officer approval, optionally elect to bench purge the canister. Approval by the Executive Officer shall be based upon assurance that the canister will be bench purged by an equivalent volume of air corresponding to a consumption of 85%, or less as determined by the manufacturer, of the manufacturers' nominal fuel tank capacity, and that the characteristics of the purge flow through the canister, such as flow rates, shall be representative of flow that occurs under the specified vehicle drivedown UDDS cycles.

4.4.9. The canister shall be isolated from its system after completing the canister-purging procedures.

4.4.10. When the optional canister bench purge specified in section II.B.4.4.8. is elected, the 10-percent fuel tank volume specified in 40 CFR 86.153-98(e), may be established by using a measured drain of the fuel tank, within 60 minutes of completing the canister bench purge.

4.5. Subparagraph (e) [No change.]

5. §86.154-98 Measurement procedure; refueling test [August 23, 1995] ~~[No change].~~

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

5.2. Amend subparagraph (e) (6) to include: If using California certification fuel, the fuel shall be dispensed at a temperature of 79±1.5 ºF (26.1±0.8 ºC) and at a dispensing rate of 9.8±0.3 gal/min (37.1±1.1 liter/min).

6. §86.155-98 Records required; refueling test [April 6, 1994] [No change].

7. §86.156-98 Calculations [April 6, 1994] [No change.]