

ATTACHMENT 4

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: [insert amended date]

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 October 17, 2007. The text of modifications made subsequent to the January 23, 2009 Board Hearing, and described in the Notice of Availability of Modified Text (15-day Notice), is shown in double-underline to indicate additions and ~~double-strikeout~~ to indicate deletions. The second 15-day modified language now proposed by staff is shown in **bold italics double underline** to indicate additions and in ~~**bold italicized double strikeout**~~ to indicate deletions. Existing

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intervening text that is not amended is indicated by a row of asterisks (* * * * *).

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

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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 ~~2012-2014~~ 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. A manufacturer may elect to certify ~~a 2009~~ ~~or a 2010~~ 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.

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II. Refueling Emissions Test Procedures

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B. Refueling Emissions

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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 ~~2012-2014~~ 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~~2014 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 Section~~ 86.132-96(a) through (j), with the following exceptions.

* * * *

4.1.3. After the second fuel drain and tank refill step is completed, ~~the canister shall be loaded according to the following steps. Prior to conducting these steps, 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, of the “California Evaporative Emission Standards and Test Procedures For 2001 and Subsequent Model Motor Vehicles.”~~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.

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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.

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4.3. Subparagraph (c), amend subparagraph (c)(1) to include: A ~~20122011~~ 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.

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4.4. Amend subparagraph (d) as follows: Canister purging: non-integrated systems. For all vehicles, except for ~~20122011~~ and subsequent model-year off-vehicle charge capable hybrid electric vehicles equipped with non-integrated refueling canister-only systems, ~~W~~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 ~~20122011~~ and subsequent model-year off-vehicle charge capable hybrid electric vehicles equipped with non-integrated refueling canister-only systems, ~~V~~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 86.153-98~~this section. The ~~Executive Officer Administrator~~ may choose to shorten the vehicle driving for a partial refueling test as described in subparagraph (d)(3) of ~~40 CFR 86.153-98~~this section. 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 ~~20122011~~ 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 ~~canister preconditioning process~~soak period specified in section II.B.4.1.7., for ~~2012~~2011 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.

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