

California Environmental Protection Agency
AIR RESOURCES BOARD

**CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR
2001 AND SUBSEQUENT MODEL
PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES**

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Note: This document shows the final amendments to the text as amended May 2, 2008, in underline to indicate additions and ~~strikeout~~ to indicate deletions. Existing intervening text that is not amended is indicated by “* * * *”.

As Amended: December 2, 2009
Date of Initial Board Hearing: January 22-23, 2009
Date of Second Board Hearing: May 28-29, 2009

NOTE: This document is incorporated by reference in sections 1960.1(k) and 1961(d), title 13, California Code of Regulations (CCR). It contains the majority of the requirements necessary for certification of a passenger car, light-duty truck or medium-duty vehicle for sale in California, in addition to containing the exhaust emission standards and test procedures for these motor vehicles. However, reference is made in these test procedures to other ARB documents that contain additional requirements necessary to complete an application for certification. These other documents are designed to be used in conjunction with this document. They include:

1. “California Exhaust Emission Standards and Test Procedures for 2005 and Subsequent through 2008 Model Zero-Emission Vehicles, and 2001 and Subsequent through 2008 Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes” (incorporated by reference in section 1962, title 13, CCR);

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, title 13, CCR);

23. “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles” (incorporated by reference in section 1976(c), title 13, CCR);

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

45. OBD II (section 1968, et seq. title 13, CCR, as applicable);

56. “California Smog Index Label Specifications for 2004 through 2009 Model Year Passenger Cars and Light-Duty Trucks” (incorporated by reference in section 1965, title 13, CCR);

67. “California Environmental Performance Label Specifications for 2009 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles” (incorporated by reference in section 1965, title 13, CCR);

78. Warranty Requirements (sections 2037 and 2038, title 13, CCR);

89. “Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks” (incorporated by reference in section 2235, title 13, CCR);

910. Guidelines for Certification of Federally Certified Light-Duty Motor Vehicles for Sale in California (incorporated by section 1960.5, title 13, CCR); and

~~4011~~. “California Non-Methane Organic Gas Test Procedures,” (incorporated by reference in section 1961(d), title 13, CCR).

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

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The provisions of Subparts B, C, and S, Part 86, Title 40, Code of Federal Regulations, as adopted or amended 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, and to the extent they pertain to exhaust emission standards and test procedures, are hereby adopted as the “California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” with the following exceptions and additions.

**PART I: GENERAL PROVISIONS FOR CERTIFICATION AND IN-USE
VERIFICATION OF EMISSIONS**

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B. Definitions, Acronyms and Abbreviations

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2. California Definitions.

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“**All-Electric Range Test**” means a test sequence used to determine the range of an electric or hybrid electric vehicle without the use of its auxiliary power unit. The All-Electric Range Test is described in the “California Exhaust Emission Standards and Test Procedures for 2005 ~~and Subsequent~~ through 2008 Model Zero-Emission Vehicles, and 2001 ~~and Subsequent~~ through 2008 Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” ~~as incorporated by reference in section 1962(e) 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.”, title 13, CCR.

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“**Zero-emission vehicle**” or “**ZEV**” means any vehicle certified to the zero-emission standards set forth in the “California Exhaust Emission Standards and Test Procedures for 2005 ~~and Subsequent~~ through 2008 Model Zero-Emission Vehicles, and 2001 ~~and Subsequent~~ through 2008 Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” ~~as incorporated by reference in section 1962 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.”, title 13, CCR.

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E. California Exhaust Emission Standards.

Delete 40 CFR §§86.1811 through 86.1819.

Introduction. The following Section E. contains the exhaust emission standards, phase-in requirements and reactivity adjustment factors applicable to California passenger cars, light-duty trucks and medium-duty vehicles. A manufacturer must demonstrate compliance with the exhaust standards applicable to specific test groups, and with the composite phase-in requirements applicable to the manufacturer's entire fleet.

A manufacturer has the option of certifying engines used in incomplete and diesel MDVs with a gross vehicle weight rating of greater than 8,500 lbs. to the heavy-duty engine standards and test procedures set forth in sections 1956.8(g) and (h), title 13, CCR, except when the federal vehicle is chassis-certified. If a federal vehicle with a gross vehicle weight rating of greater than 8,500 lbs. is certified to chassis standards, then the equivalent California vehicle must either be certified to the exhaust emission standards applicable to medium-duty vehicles as set forth in section 1961, title 13, CCR or to the federal Tier 2 standards, as per the requirements of section H.1.4 of these test procedures.

The procedures for meeting the ZEV phase-in requirements and for earning ZEV credits are contained in the “California Exhaust Emission Standards and Test Procedures for 2005 ~~and Subsequent through 2008~~ Model Zero-Emission Vehicles, and 2001 ~~and Subsequent through 2008~~ Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” ~~as incorporated by reference in section 1962 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.”, title 13, CCR.~~

1. Exhaust Emission Standards.

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1.7 Requirements for Vehicles Certified to the Optional 150,000 Mile Standards.

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(b) Requirement to Generate a Partial ZEV Allowance. A manufacturer that certifies to the 150,000 mile SULEV standards shall also generate a partial ZEV allocation according to the criteria set forth in section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2005 ~~and Subsequent through 2008~~ Model Zero-Emission Vehicles, and 2001 ~~and Subsequent through 2008~~ Model Hybrid Electric

Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” as incorporated by reference in section 1962 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.”, title 13, CCR.

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1.13 Emission Standard for Fuel-Fired Heaters. Whenever a manufacturer elects to utilize an on-board fuel-fired heater on any passenger car, light-duty truck or medium-duty vehicle, the heater must meet the LEV II ULEV standards for passenger cars and light-duty trucks less than 8,500 pounds GVW set forth in Section E.1.1.2 of these test procedures. The exhaust emissions from the fuel-fired heater shall be determined in accordance with the “California Exhaust Emission Standards and Test Procedures for 2005 and Subsequent through 2008 Model Zero-Emission Vehicles, and 2001 and Subsequent through 2008 Model 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 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes.”; On-board fuel-fired heaters may not be operable at ambient temperatures above 40°F.

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2. Emission Standards Phase-In Requirements for Manufacturers

2.1 Fleet Average NMOG Requirements for Passenger Cars and Light-Duty Trucks.

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2.1.2 Calculation of Fleet Average NMOG Value.

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2.1.2.2 HEV NMOG Factor. The HEV NMOG factor for light-duty vehicles is calculated as follows:

LEV HEV Contribution Factor = 0.075 - [(Zero-emission VMT Factor) x 0.035]
ULEV HEV Contribution Factor = 0.040 - [(Zero-emission VMT Factor) x 0.030]

where Zero-emission VMT Factor for HEVs is determined in accordance with Section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2005 and Subsequent through 2008 Model Zero-Emission Vehicles, and 2001 and Subsequent through 2008 Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” as incorporated by

~~reference in section 1962 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.”, title 13, CCR,~~

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2.1.5 **Treatment of ZEVs.** ZEVs classified as LDTs (>3750 lbs. LVW) that have been counted toward the ZEV requirement for PCs and LDTs (0-3750 lbs. LVW) as specified in Section C of the “California Exhaust Emission Standards and Test Procedures for 2005 ~~and Subsequent through 2008~~ Model Zero-Emission Vehicles, and 2001 ~~and Subsequent through 2008~~ Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” ~~as incorporated by reference in section 1962, title 13, CCR and the “California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,”~~ shall be included in this equation.

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3. Calculation of Credits/Debits

3.1 Calculation of NMOG Credits/Debits

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3.1.2.1 The MDV HEV VEC allowance is calculated as follows:

1 + [(LEV standard - ULEV standard) x (Zero-emission VMT Allowance) ÷ LEV standard] for LEVs;
1 + [(ULEV standard - SULEV standard) x (Zero-emission VMT Allowance) ÷ ULEV standard] for ULEVs;
1 + [(SULEV standard - ZEV standard) x (Zero-emission VMT Allowance) ÷ SULEV standard] for SULEVs;

where “Zero-emission VMT Allowance” for an HEV is determined in accordance with Section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2005 ~~and Subsequent through 2008~~ Model Zero-Emission Vehicles, and 2001 ~~and Subsequent through 2008~~ Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” ~~as incorporated in section 1962, title 13, CCR 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.”~~

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G. Procedures for Demonstration of Compliance with Emission Standards

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8. §86.1834 Allowable maintenance.

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8.2 HEVs.

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(b) The manufacturer shall equip “off-vehicle charge capable HEVs” with a useful life indicator for the battery system consisting of a light that shall illuminate the first time the battery system is unable to achieve an all-electric operating range (starting from a full state-of-charge) which is at least 75% of the range determined for the vehicle in the Urban Driving Schedule portion of the All-Electric Range Test (see the “California Exhaust Emission Standards and Test Procedures for 2005 ~~and Subsequent through 2008~~ Model Zero-Emission Vehicles, and 2001 ~~and Subsequent through 2008~~ Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” ~~as incorporated by reference in section 1962, title 13, CCR 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”~~).

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H. Certification, Information and Reporting Requirements.

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

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4.3 HEVs.

For HEVs, the information required in the “California Exhaust Emission Standards and Test Procedures for 2005 ~~and Subsequent through 2008~~ Model Zero-Emission Vehicles, and 2001 ~~and Subsequent through 2008~~ Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes;” ~~as incorporated by reference in section 1962, title 13, CCR 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;”~~ must be supplied with the Part I application for certification.

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