

State of California
AIR RESOURCES BOARD

**CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR
2004 AND SUBSEQUENT MODEL
HEAVY-DUTY OTTO-CYCLE ENGINES AND VEHICLES**

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NOTE: This document is incorporated by reference in section 1956.8(d), title 13, California Code of Regulations (“CCR”) and also incorporates by reference various sections of Title 40, Part 86 of the Code of Federal Regulations, with some modifications. It contains the majority of the requirements necessary for certification of heavy-duty Otto-cycle engines for sale in California, in addition to containing the exhaust emissions standards and test procedures for these Otto-cycle engines.¹ The section numbering conventions for this document are set forth in subparagraph 4 on page 4. Reference is also made in this document to other California-specific requirements that are necessary to complete an application for certification. These other documents are designed to be used in conjunction with this document. They include:

1. “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles,” (incorporated by reference in section 1976, title 13, CCR);
2. Warranty requirements (sections 2035, et seq., title 13, CCR);
3. OBD II (section 1968, et seq., title 13, CCR, as applicable);
4. “California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels through 2014,” (incorporated by reference in section 2317, title 13, CCR); and
5. “California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years,” (incorporated by reference in (section 2317, title 13, CCR).

¹ The requirements for Otto-cycle engines used in complete vehicles up to 14,000 pounds GVW are contained 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,” (incorporated by reference in §1961(d), title 13, CCR 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,” (incorporated by reference in section 1961.2, title 13, CCR .

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CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 2004 AND SUBSEQUENT MODEL HEAVY-DUTY OTTO-CYCLE ENGINES AND VEHICLES

The following provisions of Subparts A, N, and P, Part 86, of Subparts A through I, Part 1036, and of Subparts A through K, Part 1065, Title 40, Code of Federal Regulations (“CFR”), as adopted or amended by the U.S. Environmental Protection Agency on the date set forth next to the 40 CFR Part 86 section listed below, and only to the extent they pertain to the testing and compliance of exhaust emissions from heavy-duty Otto-cycle engines, are adopted and incorporated herein by this reference as the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles,” with the following exceptions and additions.

Part I. GENERAL PROVISIONS FOR CERTIFICATION AND IN-USE VERIFICATION OF EMISSIONS

Subpart A - General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, Light-Duty Trucks and Heavy-Duty Engines, and for 1985 and Later Model Year New Gasoline-Fueled, Natural Gas-Fueled, Liquefied Petroleum Gas-Fueled and Methanol-Fueled Heavy Duty Vehicles

1. General Applicability. [§86.xxx-1]

A. Federal provisions.

1. §86.001-1. October 6, 2000.

1.1 Subparagraph (a). [No change.]

1.2 Delete subparagraph (b) and replace with the following: A manufacturer must certify any complete heavy-duty vehicle of 14,000 pounds gross vehicle weight rating or less in accordance with the medium-duty vehicle provisions contained 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,” incorporated herein by reference. Heavy-duty engine or vehicle provisions of subpart A do not apply to such a vehicle.

1.3 Subparagraph (c). [n/a (ADP for LDVs)]

1.4 Subparagraph (d). [n/a (NLEVs)]

1.5 Amend subparagraph (e) as follows: *Small volume manufacturers.* Special certification procedures are available for any manufacturer whose projected or actual combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line are fewer than 4,500 units based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model-year production shall be based on projected California sales. The small

volume manufacturer's heavy-duty engine certification procedures are described in 40 CFR §86.098-14.

1.6 Subparagraph (f). [n/a; exhaust opacity refers to diesel engines.]

2. §86.005-1 October 6, 2000.

2.1 Subparagraph (a). [No change.]

2.2 Delete subparagraph (b) and replace with the following: A manufacturer must certify any complete heavy-duty vehicle of 14,000 pounds gross vehicle weight rating or less and any 2020 and subsequent model incomplete heavy-duty vehicle of 10,000 pounds gross vehicle weight rating or less in accordance with the medium-duty vehicle provisions contained 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," incorporated by reference in §1961(d), title 13, CCR or 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," incorporated by reference in section 1961.2, title 13, CCR, as applicable. Heavy-duty engine or vehicle provisions of subpart A do not apply to such a vehicle.

2.3 Subparagraph (c). [No change.]

2.4 Subparagraph (d). [Reserved.]

2.5 Amend subparagraph (e) as follows: *Small volume manufacturers.* Special certification procedures are available for any manufacturer whose projected or actual combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line are fewer than 4,500 units based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model-year production shall be based on projected California sales. The small volume manufacturer's heavy-duty engine certification procedures are described in 40 CFR §86.098-14.

2.6 Subparagraph (f). [n/a; exhaust opacity refers to diesel engines.]

3. §86.016-1 April 28, 2014.

3.1 Subparagraph (a). Amend as follows:

3.1.1 Subparagraph (1). [No change.]

3.1.2 Subparagraphs (2) and (3). Delete and replace with the following: A manufacturer must certify any complete heavy-duty vehicle of 14,000 pounds gross vehicle weight rating or less and any 2020 and subsequent model incomplete heavy-duty vehicle of 10,000 pounds gross vehicle weight rating or less in accordance with the medium-duty vehicle provisions contained in 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," incorporated by reference in section 1961.2, title 13, CCR, as

applicable. Heavy-duty engine or vehicle provisions of subpart A do not apply to such a vehicle.

3.1.3 Subparagraph (4). Delete and replace with the following: The provisions of this subparagraph are contained the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”

3.1.4 Subparagraph (5). Delete and replace with the following: All heavy-duty engines and vehicles are subject to the on-board diagnostic system requirements in section 1968 et seq., title 13, CCR, as applicable.

3.2 Subparagraph (b). [No change.]

3.3 Subparagraph (c). *Greenhouse gas emission standards.* Delete and replace with the following: See 40 CFR parts 1036 and 1037 for greenhouse gas emission standards that apply for heavy-duty engines and vehicles, as modified by these test procedures.

3.4 Subparagraph (d). *Non-petroleum fueled vehicles.* Delete and replace with the following: The standards and requirements of this part apply to non-petroleum fueled motor vehicles, as described in subsection B. of this section.

3.5 Amend subparagraph (e) as follows: *Small volume manufacturers.* Special certification procedures are available for any manufacturer whose projected or actual combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line are fewer than 4,500 units based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model-year production shall be based on projected California sales. To certify its product line under these optional procedures, the small volume manufacturer must first obtain the Executive Officer’s approval. The manufacturer must meet the eligibility criteria specified in 40 CFR §86.094-14(b) before the Executive Officer’s approval will be granted. The small volume manufacturer’s heavy-duty engine certification procedures are described in 40 CFR §86.098-14.

3.6 Subparagraph (f). [n/a; exhaust opacity refers to diesel engines.]

3.7 Subparagraph (g). [n/a; alternative fuel conversions.]

3.8 Subparagraph (h). [No change.]

B. California provisions.

1. These regulations are applicable to all heavy-duty Otto-cycle methanol-fueled, ethanol-fueled, natural-gas-fueled and liquefied-petroleum-gas-fueled dedicated, dual-fuel and multi-fuel engines (and vehicles) except those engines derived from existing diesel engines. For any engine which is not a distinctly Otto-cycle engine nor derived from such, the Executive Officer shall determine whether the engine shall be subject to these regulations or alternatively to the heavy-duty diesel engine regulations, in consideration of the relative similarity of the engine's torque-speed characteristics and vehicle applications with those of

Otto-cycle and diesel engines. Reference to dual-fuel vehicles or engines shall also mean bi-fuel vehicles or engines.

2. References in the federal regulations to light-duty vehicles and light-duty trucks do not apply.

3. Any reference to vehicle sales throughout the United States shall mean vehicles and engines sales in California. Any reference to small volume manufacturer shall mean a California small-volume manufacturer as defined in section I.1.A., above.

4. Regulations concerning U.S. EPA hearings, U.S. EPA inspections, specific language on the Certificate of Conformity, evaporative emissions, high-altitude vehicles and testing, particulate and oxides of nitrogen averaging and test group standards applicable in such averaging, alternative useful life, selective enforcement audit, and Certification Short Test shall not be applicable to these procedures, except where specifically noted. The regulations pertaining to evaporative emissions are contained in "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," as incorporated in §1976, title 13, CCR.

2. Definitions. [§86.xxx-2]

A. Federal provisions.

All of the definitions in previous CFR sections continue to apply, except as otherwise noted below. Definitions specific to other requirements such as evaporative emissions are contained in those separate documents.

1. §86.004-2. January 18, 2001.
2. §86.010-2. February 24, 2009.
3. §86.012-2. September 15, 2011.

3.1 Amend paragraph as follows: The definitions of §86.010-2 continue to apply to model year 2010 and later model year engines and vehicles. The definitions listed in this section apply beginning with model year 2012. "GHG Urban Bus" means a passenger-carrying vehicle with a load capacity of fifteen or more passengers and intended primarily for intracity operation, i.e., within the confines of a city or greater metropolitan area. GHG urban bus operation is characterized by short rides and frequent stops. To facilitate this type of operation, more than one set of quick-operating entrance and exit doors would normally be installed. Since fares are usually paid in cash or tokens, rather than purchased in advance in the form of tickets, GHG urban buses would normally have equipment installed for collection of fares. GHG urban buses are also typically characterized by the absence of equipment and facilities for long distance travel, e.g., rest rooms, large luggage compartments, and facilities for stowing carry-on luggage.

B. California provisions.

"**Administrator**" means the Executive Officer of the Air Resources Board.

"**Certificate of Conformity**" means "Executive Order" certifying vehicles for sale in California.

“Certification” means certification as defined in Section 39018 of the Health and Safety Code.

“Designated Compliance Officer” means the Executive Officer of the Air Resources Board or his or her delegate.

“EPA” means “Air Resources Board” or the Executive Officer of the Air Resources Board.

“EPA Enforcement Officer” means the Executive Officer of the Air Resources Board or his or her delegate.

“Medium-Duty Engine” means a heavy-duty engine that is used in a medium-duty vehicle.

“Medium-Duty Vehicle” means any 1992 through 2006 model-year heavy-duty low-emission, ultra-low-emission, super-ultra-low-emission or zero-emission vehicle certified to the standards in section 1960.1(h)(2) having a manufacturer’s gross vehicle weight rating of 14,000 pounds or less and any 2000 and subsequent model heavy-duty low-emission, ultra-low-emission, super-ultra-low-emission or zero-emission vehicle certified to the standards in section 1961(a)(1), 1961.2, or 1962 having a manufacturer’s gross vehicle weight rating between 8,500 and 14,000 pounds.

“Optional Low NOx Engine” means a 2015 or subsequent model heavy-duty Otto-cycle engine certified to the optional low NOx emission standards, which are below the 0.20 g/bhp-hr emission standard for 2007 and subsequent model engines. The optional low NOx emission standards are 0.10, 0.05, or 0.02 g/bhp-hr.

“Warranty” means the warranty provisions set forth in title 13, California Code of Regulations §2036.

3. Abbreviations. [§86.xxx-3]

A. Federal provisions.

1. §86.000-3. October 22, 1996. All federal abbreviations apply, except as otherwise noted below. Abbreviations specific to other requirements are contained in those separate documents.

B. California provisions.

CCR means California Code of Regulations

LEV means low-emission vehicle

ULEV means ultra-low-emission vehicle

SULEV means super-ultra-low-emission vehicle

MDV means medium-duty vehicle

4. Section numbering; construction.

§86.084-4. September 21, 1994. [No change.]

The section numbering convention employed in these test procedures, in order of priority, is I.1.A.1.1. in order to distinguish California procedures and requirements from those of the U.S. EPA. References in these test procedures to specific sections of the Code of Federal Regulations maintain the same numbering system employed in the

Code of Federal Regulations. California-only requirements are set forth in a separate subsection. In the beginning of each section the generic notation §86.xxx-1 is used when there is more than one applicable section (or when no versions of the section are being incorporated) to indicate the section being discussed without regard to model year. The years of applicability (denoted generically by “xxx”) are added as applicable in the pertinent subsections.

In cases where the entire CFR section is incorporated by reference with no modifications, the notation “[No change.]” is used. In cases where the federal requirements are modified by California requirements, the notation “Amend (or delete) subparagraph (___) as follows:” is used. If the federal requirement is not applicable, the notation “[n/a]” is used. In cases where there are California only requirements, the additional California requirements are noted in a separate subsection with the numbering convention set forth above.

If a CFR section for a specific model year is set forth in this document, and that CFR section references previous CFR sections, then all previously referenced CFR sections are deemed incorporated into this document unless otherwise noted.

5. General Standards; increase in emissions; unsafe conditions. [§86.090-5] November 12, 1996. [No change.]
6. Hearings on certification. **[§86.078-6] [n/a]**
7. Maintenance of records; submittal of information; right of entry. [§86.000-7] April 28, 2014. [No change.]
8. Emission standards for light-duty vehicles. **[§86.xxx-8] [n/a]**
9. Emission standards for light-duty trucks. **[§86.xxx-9] [n/a]**
10. Emission standards for Otto-cycle heavy-duty engines and vehicles. **[§86.xxx-10]**
 - A. **Federal provisions.**
 1. **§86.098-10.** April 30, 2010. Amend as follows:
 - 1.1 Amend subparagraph (a) as follows:
 - 1.1.1 Delete subparagraph (a)(1) and replace with emission standards set forth in Section I.10.B below.]
 - 1.1.2 Subparagraph (a)(2). [No change.]
 - 1.1.3 Subparagraph (a)(3). [No change.]
 - 1.2 Subparagraph (b) [n/a] [See evap TPs]
 - 1.3 Subparagraph (c) [No change.]
 - 1.4 Subparagraph (d) [No change.]
 2. **§86.099-10.** [n/a; See evap TPs.]
 3. **§86.005-10.** April 28, 2014. Amend as follows:
 - 3.1 Subparagraph (a): [No change.] [See, also emission standards in I.10.B below]
 - 3.2 Subparagraph (b) [n/a] [See evap TPs]
 - 3.3 Subparagraph (c) [No change.]
 - 3.4 Subparagraph (d) [No change.]
 - 3.5 Subparagraph (e) [No change.]
 - 3.6 Subparagraph (f) [No change.]

4. **§86.008-10.** April 28, 2014. Amend as follows:
 - 4.1 Subparagraph (a): [No change.]
[See, also emission standards in I.10.B below]
 - 4.2 Subparagraph (b) [n/a] [See evap TPs]
 - 4.3 Subparagraph (c) [No change.]
 - 4.4 Subparagraph (d) [No change.]
 - 4.5 Subparagraph (e) [No change.]
 - 4.6 Subparagraph (f) [No change.]
 - 4.7 Subparagraph (g) [No change.]

B. California provisions.

1. Exhaust emissions from new 2004 and later model year Otto-cycle medium- and heavy-duty engines, except for Otto-cycle medium- and heavy-duty engines subject to the alternative standards in 40 CFR §86.005-10(f), shall not exceed:

California Emission Standards for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines^A
(in g/bhp-hr)

Model Year	Emission Category	NMHC + NOx	NMHC	NOx	CO ^H	HCHO	PM
Standards for Heavy-Duty Otto-Cycle Engines Used In 2004 through 2019 Model Medium-Duty Vehicles 8,501 to 10,000 pounds GVW^B and 2004 and Subsequent Model Medium-Duty Vehicles 10,001 to 14,000 pounds GVW^C							
2004	ULEV	2.4 or 2.5 with 0.5 NMHC cap ^D	n/a	n/a	14.4	0.05	n/a
	SULEV	2.0	n/a	n/a	7.2	0.025	n/a
2005 through 2007 ^F	ULEV	1.0 ^{D,F}	n/a	n/a	14.4	0.05	n/a
	SULEV	0.5 ^{D,F}	n/a	n/a	7.2	0.025	n/a
2008 and subsequent ^G	ULEV	n/a	0.14 ^F	0.20 ^F	14.4	0.01	0.01
	SULEV	n/a	0.07 ^F	0.10 ^F	7.2	0.005	0.005
Standards for Heavy-Duty Otto-Cycle Engines Used In Heavy-Duty Vehicles Over 14,000 pounds GVW							
2004	n/a	2.4 or 2.5 with 0.5 NMHC cap ^D	n/a	n/a	37.1	0.05 ^E	n/a
2005 through 2007 ^F	n/a	1.0 ^{D,F}	n/a	n/a	37.1	0.05 ^E	n/a
2008 and subsequent ^G	n/a	n/a	0.14 ^F	0.20 ^F	14.4	0.01	0.01
2015 and subsequent ^I	Optional	n/a	0.14	0.10, 0.05, or 0.02	14.4	0.01	0.01

^A These standards apply to petroleum-fueled, alcohol-fueled, liquefied petroleum gas-fueled and natural gas-fueled Otto-cycle engines. Alcohol-fueled engines have the option of certifying to the organic material

hydrocarbon equivalent (“OMHCE”) or organic material non-methane hydrocarbon equivalent (“OMNMHCE”) standard.

^B For the 2020 and subsequent model years, medium-duty vehicles 8,501 to 10,000 pounds GVW must certify to the primary emission standards and test procedures for complete vehicles specified in section 1961.2, title 13, CCR.

^C A manufacturer of engines used in incomplete medium-duty vehicles may choose to comply with these standards as an alternative to the primary emission standards and test procedures for complete vehicles specified in section 1961 or 1961.2, title 13, CCR. A manufacturer that chooses to comply with these optional heavy-duty engine standards and test procedures shall specify, in the Part I application for certification, an in-use compliance test procedure, as provided in section 2139(c), title 13 CCR.

^D A manufacturer may request to certify to the Option 1 or Option 2 federal NMHC + NO_x standards as set forth in 40 CFR §86.005-10(f). However, for engines used in medium-duty vehicles the formaldehyde level must meet the standard specified above.

^E This standard only applies to methanol-fueled Otto-cycle engines.

^F A manufacturer may elect to include any or all of its medium- and heavy-duty Otto-cycle engine families in any or all of the emissions ABT programs for HDEs, within the restrictions described in section I.15 of these test procedures. For engine families certified to the Option 1 or 2 federal standards the FEL must not exceed 1.5 g/bhp-hr. If a manufacturer elects to include engine families certified to the 2005 and subsequent model year standards, the NO_x plus NMHC FEL must not exceed 1.0 g/bhp-hr. For engine families certified to the 2008 and subsequent model year standards, the FEL is the same as set forth in 40 CFR 86.008-10(a)(1).

^G A manufacturer may elect to include any or all of its medium- and heavy-duty Otto-cycle engine families in any or all of the emissions ABT programs for HDEs, within the restrictions described in section I.15 of these test procedures.

^H Idle carbon monoxide: For all Otto-cycle heavy-duty engines utilizing aftertreatment technology, and not certified to the on-board diagnostics requirements of title 13, CCR, §1968, et seq, as applicable, the CO emissions shall not exceed 0.50 percent of exhaust gas flow at curb idle.

^I Optional Low NO_x Emission Standards from Heavy Duty Engines. Manufacturers may choose to produce heavy duty engines that emit less NO_x emissions than standard 0.20 g/bhp-hr engines. A manufacturer may not include an engine family certified to the optional NO_x emission standards in the ABT programs for NO_x but may include it for NMHC.

2. Optional Standards for Complete and Incomplete Heavy-Duty Vehicles.

Manufacturers may request to group complete and incomplete heavy-duty vehicles into the same test group as vehicles certifying to the LEV III exhaust emission standards and test procedures specified in title 13, CCR, §1961.2, so long as those complete and incomplete heavy-duty Otto-cycle vehicles meet the most stringent LEV III standards to which any vehicle within that test group certifies.

11. Emission standards for heavy-duty diesel engines and vehicles. **[\$86.xxx-11]** [n/a]
12. Alternative certification procedures. **[\$86.080-12]** April 17, 1980. [No change.]
13. Alternative durability program. **[\$86.xxx-13]** [n/a]
14. Small-volume manufacturers certification procedures. **[\$86.xxx-14]**. [Note: A small volume manufacturer shall mean a California small volume manufacturer as defined in Section I.1.A., above. Any reference to 10,000 units shall mean 4,500 units in California based on a three year running average as defined in I.1.A., above.]
 1. §86.094-14. April 28, 2014. Amend as follows:
 - 1.1 Subparagraphs (a) through (c)(3) [No change.]
 - 1.2 Amend subparagraph (c)(4) as follows: Small volume manufacturers shall include in their records all of the information that EPA requires in §86.094-21. This information will be considered part of the manufacturer’s application for certification. [The last sentence is deleted.]

- 1.3 Subparagraphs (c)(5) through (c)(7)(i)(B) [No change.]
- 1.4 Amend subparagraph (c)(7)(i)(C)(1) as follows: Manufacturers with aggregated sales of less than 301 motor vehicles and motor vehicle engines per year may use assigned deterioration factors that the Administrator determines and prescribes based on design specifications or sufficient control over design specifications, development data, in-house testing procedures, and in-use experience. [The remainder of the paragraph is the same.]
- 1.5 Subparagraph (c)(7)(i)(C)(2) through (c)(13)(i) [No change.]
- 1.6 Add the following sentence to subparagraph (c)(13)(ii): All running changes that do not adversely affect emissions or the emission control system durability shall be deemed approved unless disapproved by the Executive Officer within 30 days of the implementation of the running change.
- 2. §86.095-14. April 30, 2010. [No change.]
- 3. §86.098-14. April 6, 1994. [No change.]
- 15. NOx and particulate averaging, trading, and banking for heavy-duty engines. **[§86.xxx-15.]**
 - A. Federal provisions.**
 - 1. §86.004-15. October 6, 2000. [No change.]
 - 2. §86.007-15. January 18, 2001. Amend as follows:
 - 2.1 Subparagraphs (a) through (m)(2): [No change.]
 - 2.2 Subparagraph (m)(3): Delete.
 - 2.3 Subparagraphs (m)(4) through m(10). [No change.]
 - B. California provisions.**
 - 1. A manufacturer may not include an engine family certified to the optional NOx emission standards in the ABT programs for NOx but may include it for NMHC.
- 16. Prohibition of defeat devices. **§86.004-16.** July 13, 2005. [No change.]
- 17. Emission control diagnostic system for light-duty vehicles and trucks. **[§86.007-17]** Delete; replace with: All heavy-duty Otto-cycle engines up to 14,000 pounds GVW must have an on-board diagnostic system as required in section 1968, et seq., title 13, CCR, as applicable.
- 18. [Reserved.]
- 19. [Reserved.]
- 20. Incomplete vehicles, classification. **§86.085-20. January 12, 1983. [No change.]**
- 21. Application for certification. **[§86.xxx-21]**
 - A. Federal provisions.**
 - 1. §86.004-21. April 28, 2014. [No change.]
 - 2. §86.007-21. April 28, 2014. [No change - diesel only.]
 - B. California provisions.**
 - For California vehicles not certified exclusively on gasoline or diesel fuel, the manufacturer shall submit projected California sales and fuel economy data nineteen months prior to January 1 of the model year for which the engines are certified.
- 22. Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certifications and Selective Enforcement

- Audit, adequacy of limits, and physically adjustable ranges. **[§86.094-22]** April 30, 2010. [No change.]
- 23. Required data. [§86.xxx-23]**
- A. Federal provisions.**
1. §86.001-23. April 28, 2014. [No change.]
 2. §86.007-23. April 28, 2014. [No change.]
- B. California provisions.**
1. The data derived from testing to determine the exhaust emission deterioration factors shall be submitted to the Executive Officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the Executive Officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the Executive Officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the Executive Officer for review and approval.
 2. In lieu of testing for formaldehyde emissions for certification, a manufacturer may provide a statement in its application for certification that such vehicles comply with the applicable standards. Such a statement must be based on previous emission tests, development tests, or other appropriate information.
- 24. Test vehicles and engines. [§86.001-24]** October 22, 1996. [No change.]
- 25. Maintenance. [§86.xxx-25]**
1. §86.004-25. August 8, 2014. [No change.]
 2. §86.007-25. January 18, 2001. [No change.]
- 26. Mileage and service accumulation; emission measurements. [§86.004-26]** April 28, 2014.
- 27. Special test procedures. [§86.090-27].** April 11, 1989. [No change.]
- 28. Compliance with emission standards. [§86.xxx-28]**
- A. Federal provisions.**
1. §86.004-28. April 28, 2014. [No change.]
- B. California provisions.**
1. All dedicated methanol-fueled and fuel-flexible vehicles and engines shall comply with the requirements which are applicable to heavy-duty gasoline-fueled Otto-cycle vehicles and engines, except where otherwise noted. In particular, for fuel-flexible vehicles and engines, a manufacturer's proposed durability demonstration program, as required in sections 86.004-21(b)(5)(i)(A), 86.007-21(b)(5)(i)(A), 86.001-23(b)(1)(ii), and 86.007-23(b)(1)(ii), shall provide for the assessment of the durability of the engine in operation with methanol and gasoline, as well as intermediate mixtures of both fuels. A manufacturer's proposed mileage and service accumulation, as required in section 86.001-24(c), shall be conducted on methanol.
 2. For fuel-flexible vehicles and engines, the noted deterioration factors shall be determined from testing conducted with gasoline fuel. However, as an assurance that fuel-flexible vehicles and engines will comply with applicable exhaust emission standards throughout their useful lives when operated on methanol fuel, the

manufacturer shall demonstrate that exhaust emissions tests conducted with methanol fuel at the beginning, middle, and end of the durability service accumulation schedule do not exceed the applicable exhaust emission standards. For certification to be granted, the vehicle or engine may not exceed applicable certification exhaust emission standards.

3. For dual-fuel or multi-fuel gaseous engines and vehicles, the noted deterioration factors shall be determined separately for operation on each type of fuel or combination of fuels that the engine is designed to use. For certification to be granted, the provisions of 86.004-28(c) must be met separately for emissions using each type and combination of fuels.

29. Testing by the Administrator. **[\$86.091-29]**. April 28, 2014. [No change.]
30. Certification. **[\$86.xxx-30]**.
 1. §86.004-30. April 28, 2014. [No change.]
 2. §86.007-30. April 28, 2014. [No change.]
31. Separate certification. **[\$86.079-31]**. September 8, 1977. [No change.]
32. Addition of a vehicle or engine after certification. **[\$86.079-32]**. September 8, 1977. [No change.]
33. Changes to a vehicle or engine covered by certification. **[\$86.079-33]**. September 8, 1977. [No change.]
34. Alternative procedure for notification of additions and changes. **[\$86.082-34]**. November 2, 1982. [No change.]
35. Labeling. **[\$86.xxx-35]**
 - A. **Federal provisions.**
 1. §86.001-35. April 6, 1994.
 - 1.1 Add the following sentence to the introductory paragraph: The labeling requirements of this section shall apply to all new motor vehicle engines certified according to the provisions of California Health and Safety Code Section 43100.
 - 1.2 Subparagraphs (a)(1) through (a)(3)(iii)(G). [No change.]
 - 1.3 Amend subparagraph (a)(3)(iii)(H) as follows: An unconditional statement of compliance with the appropriate model year California regulations; for example, "This engine conforms to California regulations applicable to XXXX model year new heavy-duty Otto-cycle engines." It may also state that the engine conforms to any applicable federal or Canadian emission standards for new heavy-duty Otto-cycle engines.
 2. §86.007-35. February 19, 2015. [No change, except as noted above for §86.001-35.]
 - B. **California Provisions**
 1. For 2004 through 2007 model year engines certified to the optional standards in §86.005-10(f) the following statement shall also be printed on the label, "This engine conforms to the California ULEV standards applicable to 20XX model year Heavy-Duty Otto-Cycle Engines."
 2. For 2015 and subsequent model year Otto- cycle engines certified to the Optional Low NOx Engine emission standards, the label shall contain the following statement: "This engine conforms to California regulations applicable to XXXX

model year heavy-duty Otto-cycle engines and is certified to the Optional Low NOx Engine emission standard of XXX g/bhp-hr.”

36. Submission of vehicle identification numbers. **[\$86.079-36] [n/a]**
37. Production vehicles and engines. **[\$86.085-37]**. April 28, 2014. [No change.]
38. Maintenance instructions. **[\$86.xxx-38]**
 1. §86.004-38. April 28, 2014.
 - 1.1 Subparagraphs (a) through (f). [No change.]
 - 1.2 Amend subparagraph (g)(1) as follows:
 - (g) Emission control diagnostic service information:
 - (1) Manufacturers shall furnish or cause to be furnished to any person engaged in the repairing or servicing of motor vehicles or motor vehicle engines, or the Administrator upon request, any and all information needed to make use of the on-board diagnostic system and such other information, including instructions for making emission-related diagnosis and repairs, including, but not limited to, service manuals, technical service bulletins, recall service information, data stream information, bi-directional control information, and training information, unless such information is protected by section 208(c) of the Act or California Government Code Section 6250, as a trade secret. No such information may be withheld under section 208(c) of the Act or California Government Code Section 6250, if that information is provided (directly or indirectly) by the manufacturer to franchised dealers or other persons engaged in the repair, diagnosing, or servicing of motor vehicles or motor vehicle engines.
 - 1.3 Subparagraphs (g)(2) through (i). [No change.]
 2. §86.010-38. April 28, 2014. [No change, except as noted above for §86.004-38 subparagraph (g)(1).]
39. Submission of maintenance instructions. **[\$86.079-39]** September 8, 1977. [No change.]
40. Heavy-duty engine rebuilding practices. **[\$86.xxx-40]**
 1. §86.004-40. January 18, 2001.
 - 1.1 Add the following sentence to the introductory paragraph: Any deviation from the provisions contained in this section is also a prohibited act under the California Vehicle Code §§27156, et seq.
 - 1.2 Subparagraphs (a) through (e). [No change.]

Part II. OTHER REQUIREMENTS; TEST PROCEDURES

Subpart N - Exhaust Test Procedures for Heavy-Duty Engines

- 86.1301-90 Scope; applicability. July 13, 2005.
- 86.1302-84 Definitions. November 16, 1983.
- 86.1303-84 Abbreviations. November 16, 1983.
- 86.1304 Section numbering; construction. July 13, 2005.
- 86.1305 Introduction; structure of subpart. August 8, 2014.
- 86.1333 Transient test cycle generation. April 28, 2014.

Subpart P - Emission Regulations for New Gasoline-Fueled and Methanol-Fueled Otto-Cycle Heavy-Duty Engines and New Gasoline-Fueled and Methanol-Fueled Otto-Cycle Light-Duty Trucks; Idle Test Procedures.

- 86.1501 Scope; applicability. June 30, 2008.
- 86.1502 Definitions. June 30, 2008.
- 86.1503 Abbreviations. June 30, 2008.
- 86.1505 Introduction; structure of subpart. June 30, 2008.
- 86.1506 Equipment required and specifications; overview. June 30, 2008.
- 86.1509 Exhaust gas sampling system. June 30, 2008.
- 86.1511 Exhaust gas analysis system. June 30, 2008.
- 86.1513 Fuel specifications. June 30, 2008.
- 86.1514 Analytical gases. June 30, 2008.
- 86.1516 Calibration; frequency and overview. June 30, 2008.
- 86.1519 CVS calibration. June 30, 2008.
- 86.1522 Carbon monoxide analyzer calibration. June 30, 2008.
- 86.1524 Carbon dioxide analyzer calibration. June 30, 2008.
- 86.1526 Calibration of other equipment. June 30, 2008.
- 86.1527 Idle test procedure; overview. June 30, 2008.
- 86.1530 Test sequence; general requirements. June 30, 2008.
- 86.1537 Idle test run. June 30, 2008.
- 86.1540 Idle exhaust sample analysis. June 30, 2008.
- 86.1542 Information required. June 30, 2008.
- 86.1544 Calculation; idle exhaust emissions. June 30, 2008.

Appendix I to Part 86 - Urban Dynamometer Schedules.

(f)(1) EPA Engine Dynamometer Schedule for Heavy-Duty Gasoline-Fueled Engines. April 29, 1998.

Appendix XII to Part 86 - Tables for Production Compliance Auditing of Heavy-Duty Engines and Heavy-Duty Vehicles, Including Light-Duty Trucks. August 30, 1985. [n/a as applies to light-duty trucks]

PART 1036 – CONTROL OF EMISSIONS FROM NEW AND IN-USE HEAVY-DUTY HIGHWAY ENGINES

Subpart A – Overview and Applicability

- 1036.1 Does this part apply for my engines? September 15, 2011.
- 1036.2 Who is responsible for compliance? September 15, 2011.
- 1036.5 Which engines are excluded from this part's requirements? June 17, 2013.
- 1036.10 How is this part organized? September 15, 2011.
- 1036.15 Do any other regulation parts apply to me? September 15, 2011.
- 1036.30 Submission of information. September 15, 2011.
1. Amend subparagraph as follows: Send all reports and requests for approval to the ARB Designated Compliance Officer, as follows: Chief, Emissions Compliance, Automotive Regulations and Science Division, California Air Resources Board, 9480 Telstar Avenue, Ste. #4, El Monte, CA 91731.

Subpart B – Emission Standards and Related Requirements

- 1036.100 Overview of exhaust emission standards. September 15, 2011.
- 1036.108 Greenhouse gas emission standards. September 15, 2011.
1. Add the following section to the introductory paragraph: Optional Compliance Via the 2014 MY National Heavy-Duty Engine and Vehicle Greenhouse Gas Program. For the 2014 through 2022 model years, a manufacturer may elect to demonstrate compliance with this section, §1036.108, for all of its applicable heavy-duty engines by demonstrating compliance with the 2014 MY National Heavy-Duty Engine and Vehicle Greenhouse Gas Program, if it meets the criteria identified below.
 - (1) A manufacturer that selects compliance with this option must notify the Executive Officer of that selection, in writing, prior to the start of the applicable model year or December 1, 2014, whichever is later;
 - (2) The manufacturer must submit to ARB all data that it submitted to U.S. Environmental Protection Agency in accordance with the reporting requirements as required under 40 CFR §1036.205, §1036.250, and §1036.730, for demonstrating compliance with the 2014 MY National Heavy-Duty Engine and Vehicle Greenhouse Gas Program and the U.S. Environmental Protection Agency determination of compliance. With the exception of the 2014 model year, all such data must be submitted within 30 days of receipt of the U.S. Environmental Protection Agency Certificate of Conformity or of the date of submission to the U.S. Environmental Protection Agency, whichever is later, for each model year that a manufacturer selects compliance with this option;
 - (3) The manufacturer must provide to the Executive Officer separate numbers for each engine family of heavy-duty engines produced and delivered for sale in California each model year and all values used in calculating positive or negative emission credits in §1036.730.

- 1036.115 Other requirements. April 28, 2014.

- 1036.130 Installation instructions for vehicle manufacturers. September 15, 2011.
1. Subparagraphs (a) through (b)(1). [No change.]
 2. Delete and replace subparagraph (b)(2), as follows: State “Failing to follow these instructions when installing a certified engine in a heavy-duty motor vehicle violates federal and state law, subject to fines or other penalties as described in the Clean Air Act and California Health and Safety Code.”
 3. Subparagraphs (b)(3) through (d). [No change.]

1036.135 Labeling. September 15, 2011.

1. Amend the introductory paragraph as follows: Beginning January 1, 2015, label your engines as described in 40 CFR §86.007-35(a)(3), as modified by these test procedures, with the following additional information:
2. Subparagraph (b) through (d). [No change.]

1036.140 Primary intended service class. September 15, 2011.

1036.150 Interim provisions. June 17, 2013.

Subpart C – Certifying Engine Families

1036.205 What must I include in my application? June 17, 2013.

1036.210 Preliminary approval before certification. September 15, 2011.

1036.225 Amending my application for certification. June 17, 2013.

1036.230 Selecting engine families. September 15, 2011.

1036.235 Testing requirements for certification. September 15, 2011.

1036.241 Demonstrating compliance with greenhouse gas pollutant standards.
September 15, 2011.

1036.250 Reporting and recordkeeping for certification. September 15, 2011.

1036.255 What decisions may EPA make regarding my certificate of conformity?
September 15, 2011.

Subpart D – [Reserved]

Subpart E – In-use Testing

1036.401 In-use testing. September 15, 2011.

Subpart F – Test Procedures

1036.501 How do I run a valid emission test? September 15, 2011.

1036.525 Hybrid engines. June 17, 2013.

1036.530 Calculating greenhouse gas emission rates. September 15, 2011.

Subpart G – Special Compliance Provisions

1036.601 What compliance provisions apply to these engines? September 15, 2011.

- 1036.610 Innovative technology credits and adjustments for reducing greenhouse gas emissions. September 15, 2011.
1. Subparagraphs (a) through (c). [No change.]
 2. Amend subparagraph (d) as follows: We may seek public comment on your request. However, we will generally not seek public comment on credits/adjustments based on A to B engine dynamometer testing, chassis testing, or in-use testing.
- 1036.615 Engines with Rankine cycle waste heat recovery and hybrid powertrains. June 17, 2013.
- 1036.620 Alternate CO2 standards based on model year 2011 compression-ignition engines. [n/a; diesel]
- 1036.625 In-use compliance with family emission limits (FELs). September 15, 2011.

Subpart H – Averaging, Banking, and Trading for Certification

- 1036.701 General provisions. September 15, 2011.
- 1036.705 Generating and calculating emission credits. September 15, 2011.
- 1036.710 Averaging. September 15, 2011.
- 1036.715 Banking. September 15, 2011.
- 1036.720 Trading. September 15, 2011.
- 1036.725 What must I include in my application for certification? September 15, 2011.
- 1036.730 ABT reports. September 15, 2011.
- 1036.735 Recordkeeping. September 15, 2011.
- 1036.740 Restrictions for using emission credits. September 15, 2011.
- 1036.745 End-of-year CO2 credit deficits. September 15, 2011.
- 1036.750 What can happen if I do not comply with the provisions of this subpart? September 15, 2011.

Subpart I – Definitions and Other Reference Information

- 1036.801 Definitions. June 17, 2013.

A. Federal Provisions. [All federal definitions apply, except as otherwise noted below.]

B. California Provisions.

“2014 MY National Heavy-Duty Engine and Vehicle Greenhouse Gas Program” means the national program that applies to new 2014 and subsequent model medium- and heavy-duty engines and vehicles to control greenhouse gas emissions, as adopted by the U.S. Environmental Protection Agency (76 Fed. Reg. 57106 (September 15, 2011)), and as subsequently amended on June 17, 2013, as incorporated in and amended by these test procedures.

“Certificate of Conformity” means an Executive Order certifying vehicles for sale in California.

“Certification” means relating to the process of obtaining an Executive Order for an engine family that complies with the emission standards and requirements in this part.

“Designated Compliance Officer” means the Executive Officer of the Air Resources Board or a designee of the Executive Officer.

“Designated Enforcement Officer” means the Executive Officer of the Air Resources Board or a designee of the Executive Officer.

“EPA” shall also mean Air Resources Board or Executive Officer of the Air Resources Board.

“Manufacturer” means any person who manufactures an engine, vehicle, or piece of equipment for sale in California or otherwise introduces a new engine into commerce in California. This includes importers who import engines or vehicles for resale.

“U.S. Environmental Protection Agency” means the United States Environmental Protection Agency.

“We (us, our)” means the Executive Officer and any authorized representatives.

1036.805 Symbols, acronyms, and abbreviations. September 15, 2011.

1036.810 Incorporation by reference. September 15, 2011.

1036.815 Confidential information. September 15, 2011.

A. Federal Provisions. [No change.]

B. California Provisions. The provisions of title 17, CCR section 91000 through 91022 apply for information you consider confidential. Note that according to section 91011, emissions data shall not be identified as confidential.

1036.820 Requesting a hearing. September 15, 2011.

1. Delete subparagraph (a) and replace as follows: You may request a hearing under certain circumstances, as described elsewhere in this part.

2. Subparagraph (b). [No change.]

3. Amend subparagraph (c) as follows: If we agree to hold a hearing, we will use the procedures specified in 17 CCR sections 60055.1 through 6055.43.

1036.825 Reporting and recordkeeping requirements. September 15, 2011.

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

2. Delete subparagraph (e).

PART 1065 – ENGINE-TESTING PROCEDURES.

Subpart A – Applicability and General Provisions.

- 1065.1 Applicability. April 28, 2014.
1. Amend subparagraph (a) as follows:
 - 1.1. Introductory paragraph. [No change.]
 - 1.2. Subparagraphs (a)(1). [n/a]
 - 1.3. Amend subparagraph (a)(2) as follows: Model year 2010 and later heavy-duty highway engines we regulate under title 13, CCR, §1956.8. For earlier model years, manufacturers may use the test procedures in this part or those specified in 40 CFR part 86, subpart N, according to §1065.10, as modified by these test procedures.
 - 1.4. Subparagraphs (a)(3) through (a)(8). [n/a]
 2. Subparagraph (b). [n/a]
 3. Subparagraph (c) through (h). [No change.]
- 1065.2 Submitting information to EPA under this part. April 28, 2014.
1. Subparagraphs (a) through (d). [No change.]
 2. Amend subparagraph (e) as follows: See title 17, CCR, section 91011 for provisions related to confidential information. Note that according to this section, emission data shall not be identified as confidential.
 3. Subparagraph (f). [No change.]
- 1065.5 Overview of this part 1065 and its relationship to the standard-setting part. October 30, 2009.
- 1065.10 Other procedures. February 19, 2015.
- 1065.12 Approval of alternate procedures. April 28, 2014.
- 1065.15 Overview of procedures for laboratory and field testing. April 28, 2014.
- 1065.20 Units of measure and overview of calculations. April 28, 2014.
- 1065.25 Recordkeeping. April 28, 2014.

Subpart B – Equipment Specifications.

- 1065.101 Overview. June 30, 2008.
- 1065.110 Work inputs and outputs, accessory work, and operator demand. June 30, 2008.
- 1065.120 Fuel properties and fuel temperature and pressure. June 30, 2008.
- 1065.122 Engine cooling and lubrication. June 30, 2008.
- 1065.125 Engine intake air. September 15, 2011.
- 1065.127 Exhaust gas recirculation. July 13, 2005.
- 1065.130 Engine exhaust. April 28, 2014.
- 1065.140 Dilution for gaseous and PM constituents. April 28, 2014.
- 1065.145 Gaseous and PM probes, transfer lines, and sampling system components. April 28, 2014.
- 1065.150 Continuous sampling. July 13, 2005.
- 1065.170 Batch sampling for gaseous and PM constituents. April 28, 2014.

- 1065.190 PM-stabilization and weighing environments for gravimetric analysis. September 15, 2011.
- 1065.195 PM-stabilization environment for in-situ analyzers. June 30, 2008.

Subpart C – Measurement Instruments.

- 1065.201 Overview and general provisions. April 28, 2014.
- 1065.202 Data updating, recording, and control. April 28, 2014.
- 1065.205 Performance specifications for measurement instruments. April 28, 2014.

Measurement of Engine Parameters and Ambient Conditions

- 1065.210 Work input and output sensors. April 28, 2014.
- 1065.215 Pressure transducers, temperature sensors, and dewpoint sensors. June 30, 2008.

Flow-Related Measurements

- 1065.220 Fuel flow meter. September 15, 2011.
- 1065.225 Intake-air flow meter. April 28, 2014.
- 1065.230 Raw exhaust flow meter. April 28, 2014.
- 1065.240 Dilution air and diluted exhaust flow meters. April 28, 2014.
- 1065.245 Sample flow meter for batch sampling. July 13, 2005.
- 1065.248 Gas divider. July 13, 2005.

CO and CO₂ Measurements

- 1065.250 Nondispersive infra-red analyzer. April 28, 2014.

Hydrocarbon Measurements

- 1065.260 Flame ionization detector. April 28, 2014.
- 1065.265 Nonmethane cutter. September 15, 2011.
- 1065.267 Gas chromatograph with a flame ionization detector. April 28, 2014.
- 1065.269 Photoacoustic analyzer for ethanol and methanol. April 28, 2014.

NO_x Measurements

- 1065.270 Chemiluminescent detector. April 28, 2014.
- 1065.272 Nondispersive ultraviolet analyzer. April 28, 2014.
- 1065.275 N₂O measurement devices. April 28, 2014.

O₂ Measurements

1065.280 Paramagnetic and magnetopneumatic O₂ detection analyzers. April 28, 2014.

Air-to Fuel Ratio Measurements

1065.284 Zirconia (ZrO₂) analyzer. April 28, 2014.

PM Measurements

1065.290 PM gravimetric balance. November 8, 2010.

1065.295 PM inertial balance for field-testing analysis. April 28, 2014.

Subpart D – Calibrations and Verifications.

1065.301 Overview and general provisions. July 13, 2005.

1065.303 Summary of required calibration and verifications. April 28, 2014.

1065.305 Verifications for accuracy, repeatability, and noise. April 28, 2014.

1065.307 Linearity verification. April 28, 2014.

1065.308 Continuous gas analyzer system-response and updating-recording verification – for gas analyzers not continuously compensated for other gas species. April 28, 2014.

1065.309 Continuous gas analyzer system-response and updating-recording verification – for gas analyzers continuously compensated for other gas species. April 28, 2014.

Measurement of Engine Parameters and Ambient Conditions

1065.310 Torque calibration. April 28, 2014.

1065.315 Pressure, temperature, and dewpoint calibration. April 28, 2014.

Flow-Related Measurements

1065.320 Fuel-flow calibration. July 13, 2005.

1065.325 Intake-flow calibration. July 13, 2005.

1065.330 Exhaust-flow calibration. July 13, 2005.

1065.340 Diluted exhaust flow (CVS) calibration. September 15, 2011.

1065.341 CVS, PFD, and batch sampler verification (propane check). April 28, 2014.

1065.342 Sample dryer verification. April 30, 2010.

1065.345 Vacuum-side leak verification. April 30, 2010.

CO and CO₂ Measurements

1065.350 H₂O interference verification for CO₂ NDIR analyzers. April 28, 2014.

1065.355 H₂O and CO₂ interference verification for CO NDIR analyzers. April 28, 2014.

Hydrocarbon Measurements

1065.360 FID optimization and verification. April 28, 2014.
1065.362 Non-stoichiometric raw exhaust FID O₂ interference verification. April 28, 2014.
1065.365 Nonmethane cutter penetration fractions. April 28, 2014.
1065.369 H₂O, CO, and CO₂ interference verification for photoacoustic alcohol analyzers. April 28, 2014.

NO_x Measurements

1065.370 CLD CO₂ and H₂O quench verification. April 28, 2014.
1065.372 NDUV analyzer HC and H₂O interference verification. September 15, 2011.
1065.375 Interference verification for N₂O analyzers. April 28, 2014.
1065.376 Chiller NO₂ penetration. April 28, 2014.
1065.378 NO₂-to-NO converter conversion verification. September 15, 2011.

PM Measurements

1065.390 PM balance verifications and weighing process verification. November 8, 2010.
1065.395 Inertial PM balance verifications. July 13, 2005.

Subpart E – Engine Selection, Preparation, and Maintenance.

1065.401 Test engine selection. July 13, 2005.
1065.405 Test engine preparation and maintenance. April 28, 2014.
1065.410 Maintenance limits for stabilized test engines. February 19, 2015.
1065.415 Durability demonstration. June 30, 2008.

Subpart F – Performing an Emission Test in the Laboratory.

1065.501 Overview. April 28, 2014.
1065.510 Engine mapping. April 28, 2014.
1065.512 Duty cycle generation. April 28, 2014.
1065.514 Cycle-validation criteria for operation over specified duty cycles. September 15, 2011.
1065.516 Sample system decontamination and preconditioning. April 28, 2014.
1065.518 Engine preconditioning. April 28, 2014.
1065.520 Pre-test verification procedures and pre-test collection. April 28, 2014.
1065.525 Engine starting, restarting, and shutdown. September 15, 2011.
1065.526 Repeating void modes or test intervals. April 28, 2014.

- 1065.530 Emission test sequence. April 28, 2014.
- 1065.545 Verification of proportional flow control for batch sampling. April 28, 2014.
- 1065.546 Verification of minimum dilution ratio for PM batch sampling. April 28, 2014.
- 1065.550 Gas analyzer range verification and drift verification. April 28, 2014.
- 1065.590 PM sampling media (e.g., filters) preconditioning and tare weighing. June 30, 2008.
- 1065.595 PM sample post-conditioning and total weighing. June 30, 2008.

Subpart G – Calculations and Data Requirements.

- 1065.601 Overview. April 28, 2014.
- 1065.602 Statistics. April 28, 2014.
- 1065.610 Duty cycle generation. February 19, 2015.
- 1065.630 Local acceleration of gravity. April 28, 2014.
- 1065.640 Flow meter calibration calculations. April 28, 2014.
- 1065.642 SSV, CFV, and PDP molar flow rate calculations. April 28, 2014.
- 1065.644 Vacuum-decay leak rate. April 28, 2014.
- 1065.645 Amount of water in an ideal gas. April 28, 2014.
- 1065.650 Emission calculations. February 19, 2015.
- 1065.655 Chemical balances of fuel, intake air, and exhaust. April 28, 2014.
- 1065.659 Removed water correction. April 28, 2014.
- 1065.660 THC, NMHC, and CH₄ determination. September 15, 2011.
- 1065.665 THCE and NMHCE determination. April 28, 2014.
- 1065.667 Dilution air background emission correction. September 15, 2011.
- 1065.670 NO_x intake-air humidity and temperature corrections. September 15, 2011.
- 1065.672 Drift correction. April 30, 2010.
- 1065.675 CLD quench verification calculations. September 15, 2011.
- 1065.690 Buoyancy correction for PM sample media. April 28, 2014.
- 1065.695 Data requirements. April 28, 2014.

Subpart H – Engine Fluids, Test Fuels, Analytical Gases and Other Calibration Standards.

- 1065.701 General requirements for test fuels. April 28, 2014.

A. Federal provisions.

1. Subparagraph (a). [No change.]
2. Amend subparagraph (b) as follows: *Fuels meeting alternative specifications*. We may allow you to use a different test fuel if you show us and we find that using it does not affect your ability to comply with all applicable emission standards using commercially available fuels.
3. Subparagraphs (c) through (f). [No change.]

B. California provisions.

Identification of New Clean Fuels to be Used in Certification Testing.

Any person may petition the state board to establish by regulation certification testing specifications for a new clean fuel for which specifications for the new clean fuel are not specifically set forth in 40 CFR Part 1065, subpart H as amended herein. Prior to adopting such specifications, the state board shall consider the relative cost-effectiveness of use of the fuel in reducing emissions compared to the use of other fuels. Whenever the state board adopts specifications for a new clean fuel for certification testing, it shall also establish by regulation specifications for the fuel as it is sold commercially to the public.

(a) If the proposed new clean fuel may be used to fuel existing motor vehicles, the state board shall not establish certification specifications for the fuel unless the petitioner has demonstrated that:

(1) Use of the new clean fuel in such existing motor vehicles would not increase emissions of NMHC, NO_x, and CO, and the potential risk associated with toxic air contaminants, as determined pursuant to the procedures set forth in the "California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels through 2014" or the "California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years," as applicable. In the case of fuel-flexible vehicles or dual-fuel vehicles that were not certified on the new clean fuel but are capable of being operated on it, exhaust and evaporative emissions from the use of the new clean fuel shall not increase compared to exhaust and evaporative emissions from the use of gasoline that complies with Title 13, Division 3, Chapter 5, Article 1, California Code of Regulations.

(2) Use of the new clean fuel in such existing motor vehicles would not result in increased deterioration of the vehicle and would not void the warranties of any such vehicles.

(b) Whenever the state board designates a new clean fuel pursuant to this section, the state board shall also establish by regulation required specifications for the new clean fuel sold commercially in California.

1065.703 Distillate diesel fuel. April 28, 2014. [n/a]

1065.705 Residual fuel. April 28, 2014.

1065.710 Gasoline. February 19, 2015.

1. Subparagraph (a). [No change.]

2. Delete subparagraph (b) and replace with the following:

(b)(1) **Certification Gasoline Fuel Specifications for the 2004 through 2019 Model Years.**

For 2004 through 2019 model engines certifying in accordance with these test procedures, gasoline having the specifications listed below may be used in exhaust and evaporative emission testing as an option to the specifications in §1065.710(c). If a manufacturer elects to utilize this option, both exhaust and evaporative emission testing shall be conducted by the manufacturer with gasoline having the specifications listed

below, and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications listed below. For the 2015 through 2019 model years, gasoline having the specifications listed in the following section (b)(2) or gasoline having the specifications in §1065.710(b), may be used in exhaust and evaporative emission testing as an option to the specifications in §1065.710(c) and this section (b)(1). If a manufacturer elects to certify a 2015 through 2019 model year engine using gasoline having the specifications listed in the following section (b)(2) or gasoline having the specifications in §1065.710(b), both exhaust and evaporative emission testing shall be conducted by the manufacturer with gasoline having the specifications listed in the following section (b)(2) or gasoline having the specifications in §1065.710(b), respectively, and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications listed in the following section (b)(2) or gasoline having the specifications in §1065.710(b), respectively.

California Certification Gasoline Specifications for the 2004 through 2019 Model Years		
Fuel Property^(a)	Limit	Test Method^(b)
Octane (R+M)/2	91 (min)	D 2699-88, D 2700-88
Sensitivity	7.5 (min)	D 2699-88, D 2700-88
Lead	0-0.01g/gal (max); no lead added	§2253.4(c), title 13 CCR
Distillation Range:		§2263, title 13 CCR ^(c)
10% point	130-150 °F	
50% point ^(d)	200-210 °F	
90% point ^(e)	290-300 °F	
EP, maximum	390 °F	
Residue	2.0 vol. % (max)	
Sulfur	30-40 ppm by wt.	§2263, title 13 CCR
Phosphorous	0.005 g/gal (max)	§2253.4(c), title 13 CCR
RVP	6.7-7.0 psi	§2263, title 13 CCR
Olefins	4.0-6.0 vol. %	§2263, title 13 CCR
Total Aromatic Hydrocarbons	22-25 vol. %	§2263, title 13 CCR
Benzene	0.8-1.0 vol. % ^(f)	§2263, title 13 CCR
Multi-substituted Alkyl Aromatic Hydrocarbons	12-14 vol. % ^(g)	
MTBE	10.8-11.2 vol. %	§2263, title 13 CCR
Additives	Sufficient to meet requirements of §2257, title 13 CCR	

Copper Corrosion	No. 1	D 130-88
Gum, washed	3.0 mg/100 mL (max)	D 381-86
Oxidation Stability	1000 minutes (min)	D 525-88
Specific Gravity	Report ^(h)	
Heat of Combustion	Report ^(h)	
Carbon	Report wt. % ^(h)	
Hydrogen	Report wt. % ^(h)	

^(a) The gasoline must be blended from typical refinery feedstocks.

^(b) ASTM specification unless otherwise noted. A test method other than that specified may be used following a determination by the Executive Officer that the other method produces results equivalent to the results with the specified method.

^(c) Although §2263, title 13, CCR refers to the temperatures of the 50 and 90 percent points, this procedure can be extended to the 10 percent and end point temperatures, and to the determination of the residue content.

^(d) The range for interlaboratory testing is 195-215° F.

^(e) The range for interlaboratory testing is 285-305° F.

^(f) The range for interlaboratory testing is 0.7-1.1 percent by volume

^(g) "Detailed Hydrocarbon Analysis of Petroleum Hydrocarbon Distillates, Reformates, and Gasoline by Single Column High Efficiency (Capillary) Column Gas Chromatography," by Neil Johansen, 1992, Boulder, CO.

^(h) The fuel producer should report this fuel property to the fuel purchaser. Any generally accepted test method may be used and shall be identified in the report.

(b)(2) Certification Gasoline Fuel Specifications for the 2020 and Subsequent Model Years.

For 2020 and subsequent model engines, gasoline having the specifications listed below may be used in exhaust and evaporative emission testing as an option to the specifications in CFR §1065.710(b). If a manufacturer elects to utilize this option, both exhaust and evaporative emission testing shall be conducted by the manufacturer with gasoline having the specifications listed below, and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications listed below. If a manufacturer elects to utilize gasoline having the specifications in CFR §1065.710(b), both exhaust and evaporative emission testing shall be conducted by the manufacturer with gasoline having the specifications in CFR §1065.710(b), and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications in CFR §1065.710(b).

California Certification Gasoline Specifications for the 2020 and Subsequent Model Years		
Fuel Property^(a)	Limit	Test Method^(b)
Octane (R+M)/2 ⁽ⁱ⁾	87-88.4; 91 (min)	D 2699-88, D 2700-88
Sensitivity	7.5 (min)	D 2699-88, D 2700-88
Lead	0-0.01g/gal (max); no lead added	§2253.4(c), title 13 CCR
Distillation Range:		§2263, title 13 CCR ^(c)
10% point	130-150 °F	
50% point ^(d)	205-215 °F	
90% point ^(e)	310-320 °F	
EP, maximum	390 °F	
Residue	2.0 vol. % (max)	
Sulfur	8-11 ppm by wt.	§2263, title 13 CCR
Phosphorous	0.005 g/gal (max)	§2253.4(c), title 13 CCR
RVP	6.9-7.2 psi	§2263, title 13 CCR
Olefins	4.0-6.0 vol. %	§2263, title 13 CCR
Total Aromatic Hydrocarbons	19.5-22.5 vol. %	§2263, title 13 CCR
Benzene	0.6-0.8 vol. % ^(f)	§2263, title 13 CCR
Multi-substituted Alkyl Aromatic Hydrocarbons	13-15 vol. % ^(g)	
MTBE	0.05 vol. %	§2263, title 13 CCR
Ethanol	9.2-10.0 vol. %	§2263, title 13 CCR
Total Oxygen	3.3-3.7 wt. %	§2263, title 13 CCR
Additives	Sufficient to meet requirements of §2257, title 13 CCR	
Copper Corrosion	No. 1	D 130-88
Gum, washed	3.0 mg/100 mL (max)	D 381-86
Oxidation Stability	1000 minutes (min)	D 525-88
Specific Gravity	Report ^(h)	
Heat of Combustion	Report ^(h)	
Carbon	Report wt. % ^(h)	
Hydrogen	Report wt. % ^(h)	

- (a) The gasoline must be blended from typical refinery feedstocks.
- (b) ASTM specification unless otherwise noted. A test method other than that specified may be used following a determination by the Executive Officer that the other method produces results equivalent to the results with the specified method.
- (c) Although §2263, title 13, CCR refers to the temperatures of the 50 and 90 percent points, this procedure can be extended to the 10 percent and end point temperatures, and to the determination of the residue content.
- (d) The range for interlaboratory testing is 195-215° F.
- (e) The range for interlaboratory testing is 285-305° F.
- (f) The range for interlaboratory testing is 0.7-1.1 percent by volume.
- (g) "Detailed Hydrocarbon Analysis of Petroleum Hydrocarbon Distillates, Reformates, and Gasoline by Single Column High Efficiency (Capillary) Column Gas Chromatography," by Neil Johansen, 1992, Boulder, CO.
- (h) The fuel producer should report this fuel property to the fuel purchaser. Any generally accepted test method may be used and shall be identified in the report.
- (i) For vehicles/engines that require the use of premium gasoline as part of their warranty, the Octane ((R+M)/2) shall be a 91 minimum. All other certification gasoline specifications, as shown in this table, must be met. For all other vehicles/engines, the Octane ((R+M)/2) shall be 87-88.4.

1065.715 Natural gas. April 28, 2014.

1. Delete subparagraph (a) and replace with the following:
 - (a)(1) **Exhaust emission test fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use natural gas, fuel used for exhaust and evaporative emission testing shall meet the specifications listed in section 2292.5, title 13, CCR, (Specifications for Compressed Natural Gas) as modified by the following:

Compressed Natural Gas Certification Test Fuel	
Specification	Limit
Methane	90.0 ± 1.0 mole percent
Ethane	4.0 ± 0.5 mole percent
C ₃ and higher hydrocarbon content	2.0 ± 0.3 mole percent
Oxygen	0.5 mole percent maximum
Inert gases (CO ₂ + N ₂)	3.5 ± 0.5 vol. percent

- (a)(2) **Mileage accumulation fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use natural gas, fuel used for service accumulation shall meet the specifications listed in section 2292.5, title 13, CCR (Specifications for Compressed Natural Gas).
2. Subparagraphs (b) through (d). [No change.]

1065.720 Liquefied petroleum gas. April 28, 2014.

1. Delete subparagraph (a) and replace with the following:
 - (a)(1) **Evaporative and exhaust emission test fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use liquefied petroleum gas, fuel used

for exhaust and evaporative emission testing shall meet the specifications listed in title 13, CCR, section 2292.6 (Specifications for Liquefied Petroleum Gas) as modified by the following:

Liquefied Petroleum Gas Certification Test Fuel	
Specification	Limit
Propane	93.5 ± 1.0 volume percent
Propene	3.8 ± 0.5 volume percent
Butane and heavier components	1.9 ± 0.3 volume percent

(a)(2) Mileage accumulation fuel. For dedicated, dual-fueled or hybrid electric vehicles which use liquefied petroleum gas, fuel used for service accumulation shall meet the specifications listed in title 13, CCR, section 2292.6 (Specifications for Liquefied Petroleum Gas).

(a)(3) The specification range of the fuels to be used in this section (a) shall be measured in accordance with ASTM D2163-91 and reported in accordance with §86.094-21.

2. Subparagraphs (b) through (d). [No change.]

1065.725 High-level ethanol-gasoline blends. April 28, 2014.

A. Federal provisions. [No change.]

B. California provisions.

1. California Alcohol Certification Fuel Specifications.

1.1 **Emission test fuel.** For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel alcohol engines, methanol or ethanol fuel used for exhaust and evaporative emission testing shall meet the specifications set forth in section 2292.1, title 13, CCR, (Specifications for M-100 Fuel Methanol) or section 2292.3 (Specification for E-100 Fuel Ethanol) as modified by the following:

Specification	Limit
M-100 Fuel Methanol	
Methanol	98.0 ± 0.5 vol. percent
Ethanol	1.0 vol. percent max.
Petroleum fuel meeting the specifications of §1065.710 as modified in subparagraph 2(b)(1).	1.0 ± 0.1 vol. percent

E-100 Fuel Ethanol	
Ethanol	98.0 ± 0.5 vol. percent
Methanol	1.0 vol. percent max.
Petroleum fuel meeting the specifications of §1065.710 as modified in subparagraph 2(b)(1).	1.0 ± 0.1 vol. percent

1.2 **Mileage accumulation fuel.** For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel alcohol engines, methanol or ethanol fuel used for service accumulation shall meet the applicable specifications set forth in section 2292.1, title 13, CCR, (Specifications for M-100 Fuel Methanol) or section 2292.3 (Specification for E-100 Fuel Ethanol).

1.3 Fuel additives and ignition improvers intended for use in alcohol test fuels shall be subject to the approval of the Executive Officer. In order for such approval to be granted, a manufacturer must demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

2 California Certification Fuel Specifications – Mixtures of Petroleum and Alcohol Fuels for Flexible Fuel Vehicles.

2.1 **Exhaust emission test fuel for emission-data and durability-data vehicles.** For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel alcohol engines, methanol or ethanol fuel used for exhaust emission testing shall meet the applicable specifications set forth in section 2292.2, title 13, CCR, (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) as modified by the following. E-85 that meets the specifications in §1065.725 may be used in exhaust and evaporative emission testing as an option to the E-85 Fuel Ethanol specifications in this subparagraph. If a manufacturer elects to utilize E-85 Fuel Ethanol having the specifications listed below, the Executive Officer shall conduct exhaust emission testing with E-85 Fuel Ethanol having the specifications listed below. If a manufacturer elects to utilize E-85 Fuel Ethanol having the specifications set forth in 40 CFR §1065.725, the Executive Officer shall conduct exhaust emission testing with E-85 Fuel Ethanol having the specifications set forth in 40 CFR §1065.725.

Specification	Limit
M-85 Fuel Methanol	
Petroleum fuel meeting the specifications of §1065.710 as modified in subparagraph 2(b)(1).	13-16 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.
E-85 Fuel Ethanol	
Petroleum fuel meeting the specifications of §1065.710 as modified in subparagraph 2(b)(1).	15-21 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.

2.2 Mileage accumulation fuel. For flexible fuel Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles that use Otto-cycle or diesel alcohol engines, petroleum fuel shall meet the applicable specifications in §1065.710, as modified in §1065.710 subparagraph 2, above, and methanol or ethanol fuel shall meet the applicable specifications set forth in section 2292.2, title 13, CCR, (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specification for E-85 Fuel Ethanol). Mileage accumulation procedures shall be subject to the requirements set forth in 40 CFR §86.004-26 and §86.1831-01(a) and (b) and are subject to the prior approval of the Executive Officer. A manufacturer shall consider expected customer fuel usage as well as emissions deterioration when developing its durability demonstration.

2.3 Evaporative emission test fuel for emission-data and durability-data vehicles. For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel alcohol engines, a blend of methanol or ethanol fuel used for evaporative emission testing shall meet the applicable specifications set forth in section 2292.2, title 13, CCR, (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) and gasoline meeting the specifications of §1065.710, as modified in §1065.710 subparagraph 2, above, such that the final blend is composed of either 35 volume percent methanol (± 1.0 volume percent of total blend) for methanol-fueled vehicles or 10 volume percent ethanol (± 1.0 volume percent of total blend) for ethanol-fueled vehicles. Alternative alcohol-gasoline blends may be used in place of M35 or E10 if demonstrated to result in equivalent or higher evaporative emissions, subject to prior approval of the Executive Officer.

2.4 Additive requirements. Fuel additives and ignition improvers intended for use in alcohol test fuels shall be subject to the approval of the Executive Officer. In order for such approval to be granted, a manufacturer must

demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

- 1065.740 Lubricants. July 13, 2005.
- 1065.745 Coolants. July 13, 2005.
- 1065.750 Analytical gases. April 28, 2014.
- 1065.790 Mass standards. September 15, 2011.

Subpart I –Testing with Oxygenated Fuels.

- 1065.801 Applicability. July 13, 2005.
- 1065.805 Sampling system. April 28, 2014.
- 1065.845 Response factor determination. April 28, 2014.
- 1065.850 Calculations. April 28, 2014.

Subpart K – Definitions and Other Reference Information.

- 1065.1001 Definitions. April 28, 2014.
 - 1. Amend the definition of “Designated Compliance Officer” as follows:
Designated Compliance Officer means the Executive Officer of the Air Resources Board or a designee of the Executive Officer.
- 1065.1005 Symbols, abbreviations, acronyms, and units of measure. April 28, 2014.
- 1065.1010 Reference materials. April 28, 2014.