State of California
**AIR RESOURCES BOARD**

# CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 2004 AND SUBSEQUENT MODEL HEAVY-DUTY DIESEL 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 diesel engines for sale in California, in addition to containing the exhaust emissions standards and test procedures for these diesel engines.[1] The section numbering conventions for this document are set forth in subparagraph 4 on page 6. 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. Warranty requirements (sections 2036, et seq., title 13, CCR);

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

5. HD OBD (sections 1971, et seq., title 13, CCR, as applicable);

6. "California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels through 2014," (incorporated by reference in section 2317, title 13, CCR); and

7. "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 diesel 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 DIESEL ENGINES AND VEHICLES

The following provisions of Subparts A, I, N, S, and T, Part 86, of Subparts A through I, Part 1036, of Subparts A through L, Part 1065, and of Subparts A and E, Part 1068, Title 40, Code of Federal Regulations, as adopted or amended by the U.S. Environmental Protection Agency on the date set forth next to the applicable section listed below, and only to the extent they pertain to the testing and compliance of exhaust emissions from heavy-duty diesel engines and vehicles, are adopted and incorporated herein by this reference as the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," except as altered or replaced by the provisions set forth below.

## PART 86 – CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES

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

**§86.1 Incorporation by reference.** October 25, 2016.

### Subpart A - General Provisions for Heavy-Duty Engines and 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 Subparagraph (b) *Optional Applicability.* [No change.]

1.3 Subparagraphs (c) and (d) Reserved

1.4 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 (including all vehicles and engines imported under the provisions of 40 CFR §§85.1505 and 85.1509 of this chapter) 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 §86.092-14(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.

1.5 Subparagraph (f) *Optional procedures for determining exhaust opacity.* [No change.]

2. **§86.005-1** October 6, 2000

2.1 Subparagraph (a) [No change.]

2.2 Subparagraph (b) *Optional Applicability.* [No change.]

2.3 Subparagraph (c) [n/a; Otto-cycle]

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 (including all vehicles and engines imported under the provisions of 40 CFR §§85.1505 and 85.1509 of this chapter) 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 §86.092-14(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.

2.6 Subparagraph (f) *Optional procedures for determining exhaust opacity.* [No change.]

3. **§86.016-1** October 25, 2016.

3.1 Subparagraph (a) *Applicability.* 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) *Relationship to subpart S of this part.* [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 (including all vehicles and engines imported under the provisions of 40 CFR §§85.1505 and 85.1509) 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) *Optional procedures for determining exhaust opacity.* [No change.]

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

3.8 Subparagraph (h). *Turbine engines.* [No change.]

**B. California provisions.**

1. These regulations shall be applicable to all heavy-duty diesel methanol-fueled, ethanol-fueled, natural-gas-fueled and liquefied-petroleum gas-fueled dedicated, dual-fuel and multi-fuel engines (and vehicles) including those engines derived from existing diesel engines. For any engine that is not a distinctly diesel 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 Otto-

cycle engine regulations, in consideration of the relative similarity of the engine's torque-speed characteristics and vehicle applications with those of diesel and Otto-cycle engines. Reference to dual fuel vehicles or engines shall also mean bi-fuel vehicles or engines. References to methanol shall also mean ethanol. For guidance on classifying 2021 and subsequent model heavy heavy-duty Otto-cycle engines, used in vehicles which normally exceed 33,000 pounds GVWR, based on primary intended service class, see 40 CFR §1036.140.

2. References in the federal regulations to light-duty vehicles and light-duty trucks do not apply. References to heavy-duty Otto-cycle engines or vehicles do not apply.

3. Any reference to vehicle or engine sales or vehicle or engine production volume throughout the United States shall mean vehicle or engine sales or vehicle or engine volume in California. References to small volume manufacturers shall mean 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, non-conformance penalties, evaporative emission, high-altitude vehicles and testing, alternative useful life, 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 title 13, CCR §1976. All heavy-duty methanol- and gaseous-fueled vehicles shall comply with the evaporative requirements in title 13, CCR, §1976.

2. Definitions. [§86.xxx-2]

**A. Federal Provisions.**

1. **§86.004-2** October 25, 2016. [All federal definitions apply, except as otherwise noted below. Definitions specific to other requirements are contained in separate documents.]

2. **§86.010-2** April 30, 2010. [All federal definitions apply, except as otherwise noted below. Definitions specific to other requirements are contained in separate documents.]

3. **§86.012-2** September 15, 2011. [All federal definitions apply, except as otherwise noted below. Definitions specific to other requirements are contained in separate documents.]

3.1 Amend paragraph as follows: The definitions of 40 CFR §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.

"**ARB**" means Air Resources Board or 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**" shall also mean Air Resources Board or Executive Officer of the Air Resources Board

**"EPA Enforcement Officer"** means the Executive Officer or his or her delegate.

**"Measurement allowance"** means accuracy margin.

**"Medium-duty engine"** means a heavy-duty engine that is used to propel a medium-duty vehicle.

**"Medium-duty vehicle"** means 2004 through 2006 model year heavy-duty low-emission vehicle, ultra-low-emission vehicle, super-ultra-low-emission vehicle or zero-emission vehicle certified to the standards in title 13, CCR, section 1960.1(h)(2) having a manufacturer's gross vehicle weight rating of 14,000 pounds or less; and any 2004 and subsequent model heavy-duty low-emission, ultra-low-emission, super-ultra-low-emission or zero-emission vehicle certified to the standards in title 13, CCR section 1956.8(h), having a manufacturer's gross vehicle weight rating between 8,501 and 14,000 pounds.

**"NTE standard"** means NTE emission limit.

"**Optional Low NOx Engine**" means a 2015 or subsequent model heavy-duty diesel 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 period**" [For guidance see title 13, CCR, §2036].

3. Abbreviations. [§86.xxx-3]

**A. Federal Provisions.**

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

**B. California Provisions.**

"CCR" means "California Code of Regulations
"LEV" means low-emission vehicle
"MDV" means medium-duty vehicle
"OBD" means on-board diagnostics
"ULEV" means ultra-low-emission vehicle
"SULEV" means super-ultra-low-emission vehicle

4. Section numbering; construction. [§86.084-4]. October 25, 2016. [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 general notation §86.xxx-# 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 "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] October 25, 2016.

Amend the paragraph as follows: If a manufacturer's request for a hearing is approved, ARB will follow the hearing procedures specified in accordance with title 17, CCR, §60055.1, et seq., with respect to such issue.

7. Maintenance of records; submittal of information; right of entry. [§86.000-7] April 27, 2018. [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] [n/a]

11. Emission standards for diesel heavy-duty engines and vehicles. [§86.xxx-11]

**A. Federal provisions.**

1. **§86.004-11 Emission standards for 2004 and later model year diesel heavy-duty engines and vehicles.** April 28, 2014.

1.1 Amend subparagraph (a) as follows:

1.1.1 Amend subparagraph (a)(1) Exhaust emissions from new 2004 through 2006 model year diesel HDEs, other than diesel-fueled, dual fuel and bi-fuel urban buses, shall not exceed the following:

1.1.2 Subparagraphs (a)(1)(i) through (a)(iii)(C) [No change.]

1.1.3 Amend subparagraph (a)(2) as follows: The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over the operating schedule set forth in paragraph (f)(2) of appendix I to this part, and measured and calculated in accordance with the procedures set forth in subpart N of this part as amended in part II of these test procedures, except as noted in §86.098-28(c)(2) or superseding sections.

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

1.3. Subparagraph (c). [No change.]

1.4 Amend subparagraph (d) as follows: Every manufacturer of new motor vehicle engines subject to the standards prescribed in title 13, CCR, §1956.8 (a), §1956.8 (h), and this section shall, prior to taking any of the actions prohibited by California Health & Safety Code section 43211 or as specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with applicable procedures in subpart I or N as amended by these test procedures to ascertain that such test engines meet the requirements of paragraphs (a), (b), (c), and (d) of this section.

1.5 Subparagraph (e). [No change.]

2. **§86.007-11 Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles.** October 25, 2016.

2.1 Add the following sentence to the introductory paragraph: Except as otherwise noted, references in this subsection to heavy-duty engines or HDEs

shall include medium-duty engines as defined in Section I.2.B of these test procedures.

2.2 Subparagraphs (a) through (a)(1)(ii)(A). [No change.]

2.2.1 Amend subparagraph (a)(1)(ii)(B) as follows: Nonmethane-hydrocarbon (NMHC) for engines fueled with natural gas or liquefied petroleum gas: 0.14 grams per brake horsepower-hour (0.052 grams per megajoule).

2.2.2 Subparagraph (a)(1)(ii)(C) through (a)(iv). [No change.]

2.2.3 Amend subparagraph (a)(2) as follows: The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over the operating schedule set forth in paragraph (f)(2) of appendix I to this part, and measured and calculated in accordance with the procedures set forth in subpart N of this part as amended in part II of these test procedures, except as noted in 40 CFR §86.007-23(c)(2) or superseding sections.

2.2.4 Delete subparagraph (a)(3). [For guidance see 40 CFR, Subpart N, §86.1360-2007 of these test procedures].

2.2.5 Delete subparagraph (a)(4)(i) through (a)(4)(vi). [For guidance see 40 CFR, Subpart N, §86.1370-2007 of these test procedures]

2.3 Subparagraphs (b)(1)(i) through (b)(1)(iii). [No change.]

2.3.1 Delete subparagraph (b)(1)(iv). [For guidance see 40 CFR, Subpart N, §86.1370-2007 of these test procedures]

2.3.2 Subparagraphs (b)(2)(i). [No change.]

2.3.3 Delete subparagraph (b)(2)(ii). [For guidance see 40 CFR, Subpart N, §86.1370-2007 of these test procedures]

2.3.4 Subparagraph (b)(3) and (b)(4). [No change.]

2.4 Subparagraph (c). [No change.]

2.5 Amend subparagraph (d) as follows: Every manufacturer of new motor vehicle engines subject to the standards prescribed in title 13, CCR, §1956.8 (a), §1956.8 (h), and this section shall, prior to taking any of the actions prohibited by California Health & Safety Code section 43211 or as specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with applicable procedures in subpart I or N as amended in part II of these test procedures to ascertain that such test engines meet the requirements of paragraphs (a), (b), (c), and (d) of this section.

2.6 Subparagraphs (e) through (j). [No change.]

**B. California provisions.**

1. **Urban Bus Standards**.

1.1 The exhaust emissions from new 2004 through 2006 model year heavy-duty engines (other than diesel-fueled, dual-fuel and bi-fuel heavy-duty engines) used in urban buses shall not exceed the standards set forth in 40 CFR §86.004-11(a)(1), above.

1.2 The exhaust emissions, as measured under transient operating conditions, from 2004 through 2006 model year diesel-fueled, dual-fuel and bi-fuel heavy-duty engines used in urban buses shall not exceed:

| **2004 – 2006 Heavy-Duty Diesel-Fuel, Dual Fuel, and Bi-Fuel Urban Bus Engine Exhaust Emission Standards* (grams per brake horsepower-hour or g/bhp-hr)** | | | | |
|---|---|---|---|---|
| **NOx**[1] | **NMHC or NMHCE** | **CO**[3] | **PM**[2] | **HCHO**[4] |
| 0.5 (0.2 g/megajoule) | 0.05 (0.02 g/megajoule) | 5.0 (1.9 g/megajoule); [7.0 (2.6 g/megajoule)] | 0.01 (0.004 g/megajoule) | 0.01 (0.004 g/megajoule) |

[1] Oxides of Nitrogen (NOx). This standard is for certification testing and selective enforcement audit testing. As an option, manufacturers may choose to meet the NOx standard with a base engine that is certified to the standards in §86.004-11(a)(1), (October 6, 2000), equipped with an aftertreatment system that reduces NOx to 0.5 g/bhp-hr and PM to 0.01 g/bhp-hr. The NMHC, CO, and formaldehyde standards above shall still apply. Manufacturers shall be responsible for full certification, durability, testing, and warranty and other requirements for the base engine. For the aftertreatment system, manufacturers shall not be subject to the certification durability requirements, or in-use recall and enforcement provisions, but are subject to warranty provisions for functionality.

[2] Particulates. This standard is for certification testing, selective enforcement audit testing, and in-use testing. As an option, manufacturers may choose to meet the PM standard with an aftertreatment system that reduces PM to 0.01 g/bhp-hr. Manufacturers shall be responsible for full certification, durability, testing, and warranty and other requirements for the base engine. For the aftertreatment system, manufacturers shall not be subject to the certification durability requirements, or in-use recall and enforcement provisions, but are subject to warranty provisions for functionality.

[3] Carbon monoxide. The 5.0 g/bhp-hr (1.9 grams per megajoule) standard is for certification testing and selective enforcement audit testing, and the 7.0 g/bhp-hr (2.6 grams per megajoule) standard is for in-use testing.

[4] Formaldehyde. This standard is for certification testing. selective enforcement audit testing and in-use testing.

1.3 The exhaust emissions from new 2007 and subsequent model year heavy-duty engines used in urban buses shall not exceed the following standards:

| **2007 and Subsequent Heavy-Duty Diesel Urban Bus Engine Exhaust Emission Standards* (grams per brake-horsepower-hour or g/bhp-hr)** | | | | |
|---|---|---|---|---|
| **NOx** | **NMHC or NMHCE** | **CO** | **PM** | **HCHO** |
| 0.20 (0.075 g/megajoule) | 0.05 (0.02 g/megajoule) | 5.0 (1.9 g/megajoule) | 0.01 (0.004 g/megajoule) | 0.01 (0.004 g/megajoule) |

2. **Optional HDE and Urban Bus Standards.** A manufacturer may elect to certify 2004 through 2006 model year heavy-duty diesel engines greater than 14,000 pounds gross vehicle weight rating and heavy-duty engines used in urban buses [excluding diesel-fuel, dual-fuel and bi-fuel heavy-duty diesel engines used in urban bus engines] to the following standards, as measured under transient operating conditions. Engines certified to these standards are not eligible to participate in NOx, NOx plus NMHC, or particulate ABT programs.

| **OPTIONAL STANDARDS<br>Heavy-Duty Diesel Engines >14,000 lbs. GVW<br>(excluding diesel-fueled, dual fuel, and bi-fuel Urban Buses)<br>(grams per brake-horsepower-hour or g/bhp-hr)** | | | |
|---|---|---|---|
| **Model Year** | **NOx plus NMHC (or NMHCE)*** | **CO** | **PM** |
| 2004–2006* | 0.3 to 1.8, inclusive; (in 0.3 g/bhp-hr increments) | 15.5 | 0.01; 0.02; or 0.03 |

***** NOx plus NMHC are measured as the arithmetic sum of the NOx plus NMHC exhaust component certification values.

3. **Formaldehyde Standards**. Formaldehyde exhaust emissions from new 2004 through 2006 model methanol-fueled diesel engines, shall not exceed 0.05 g/bhp-hr.

4. **Requirements for Dual- and Bi-Fuel Engines**. For the 2004 through 2006 model years, an engine family whose design allows engine operation in either of two distinct alternative fueling modes, where each fueling mode is characterized by use of one fuel or a combination of two fuels and significantly different emission levels under each mode, may certify to a different NOx plus NMHC (depending on model year) standard for each fueling mode, provided it meets the following requirements:

(1) The NOx plus NMHC certification standard used for certification under the higher emitting fueling mode must be the standard contained in paragraph 11.A.1 above as appropriate.

(2) The NOx plus NMHC certification standard used for certification under the lower emitting fueling mode must be one of the reduced-emission standards contained in paragraph 11.B.2 above, as appropriate.

(3) The engine family is not used to participate in any manufacturer's averaging, banking or trading program.

(4) The engine family meets all other applicable emission standards in each fueling mode.

(5) The higher emitting fueling mode must be intended only for fail-safe vehicle operation in the case of a malfunction or inadvertent fuel depletion which precludes normal operation in the lower emitting fueling mode. Evidence of such design intent would be a significantly reduced horsepower versus engine speed

curve when operating in the higher emitting fueling mode as compared to the curve while operating in the lower emitting fueling mode.

(6) All applicable exhaust emission testing, data submission, and certification application requirements must be met separately for each of the two fueling modes of operation, but should be submitted for ARB approval in a single package.

5. **Standards for Medium-Duty Engines.**

5.1 **Requirements Specific to Heavy-Duty Engines Used in Medium-Duty Vehicles 8,501 to 10,000 pounds GVW.** For the 2004 through 2019 model years, a manufacturer of heavy-duty engines used in medium-duty vehicles 8,501 to 10,000 pounds GVW may choose to comply with the following standards as an alternative to the primary emission standards and test procedures specified in title 13, CCR, §1961 or §1961.2, as applicable. A manufacturer that chooses to comply with these optional heavy-duty standards and test procedures shall specify, in the application for certification, an in-use compliance test procedure, as provided in title 13, CCR, §2139(c). For the 2020 and subsequent model years, a manufacturer of heavy-duty engines used in medium-duty vehicles 8,501 to 10,000 pounds GVW must comply with the primary emission standards and test procedures specified in title 13, CCR, §1961.2.

5.2 **Requirements Specific to Heavy-Duty Engines Used in Medium-Duty Vehicles 10,001 to 14,000 pounds GVW.** For the 2004 and subsequent model years, a manufacturer of heavy-duty engines used in medium-duty vehicles 10,001 to 14,000 pounds GVW may choose to comply with the following standards as an alternative to the primary emission standards and test procedures specified in title 13, CCR, §1961 or §1961.2, as applicable. A manufacturer that chooses to comply with these optional heavy-duty standards and test procedures shall specify, in the application for certification, an in-use compliance test procedure, as provided in title 13, CCR, §2139(c).

5.3 **Exhaust Emission Standards for Medium-Duty Engines.** The exhaust emissions from new 2004 through 2019 model heavy-duty diesel engines used in ultra-low emission and super-ultra-low emission medium-duty diesel vehicles 8,501 to 10,000 pounds GVW and 2004 and subsequent model heavy-duty diesel engines used in ultra-low emission and super-ultra-low emission medium-duty diesel vehicles 10,001 to 14,000 pounds GVW shall not exceed:

| Exhaust Emission Standards for 2004 through 2006 Model Medium-Duty ULEVs and SULEVs | | | | |
|---|---|---|---|---|
| Vehicle Emission Category | NOx + NMHC | CO | PM | HCHO |
| ULEV[1] Option A | 2.5 (with a 0.5 cap on NMHC) | 14.4 | 0.10 | 0.050 |
| ULEV[1]; Option B | 2.4 | 14.4 | 0.10 | 0.050 |

| Exhaust Emission Standards for 2007 through 2019 Model Medium-Duty ULEVs and SULEVs 8,501-10,000 lbs. GVW and 2007 and Subsequent Model Medium-Duty ULEVs and SULEVs 10,001-14,000 lbs. GVW | | | | | |
|---|---|---|---|---|---|
| Vehicle Emission Category | NOx | NMHC or NMHCE | CO | PM | HCHO |
| ULEV[1] | 0.20 | 0.14 | 15.5 | 0.01 | 0.050 |
| SULEV[1] | 0.10 | 0.07 | 7.7 | 0.005 | 0.025 |

[1] Emissions averaging may be used to meet these standards using the requirements for participation averaging, banking and trading programs, as set forth in Section I.15 of these test procedures.

5.4 **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 diesel vehicles meet the most stringent LEV III standards to which any vehicle within that test group certifies.

6. **Heavy-Duty Diesel Engine Idling Requirements**.

6.1 **Engine Shutdown System.** The requirements in this subsection apply to engine manufacturers and original equipment manufacturers, as applicable, that are responsible for the design and control of engine and/or vehicle idle controls.

6.1.1 **Requirements.** Except as provided in subsections 11.B.6.2 and 3, all new 2008 and subsequent model year heavy-duty diesel engines shall be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to “neutral” or “park,” and the parking brake is engaged. If the parking brake is not engaged, then the engine shutdown system shall shut down the engine after 900 seconds of continuous idling operation once the vehicle is stopped and the transmission is set to “neutral” or “park.” The engine shutdown system must be tamper-resistant and non-

programmable. A warning signal, such as a light or sound indicator inside the vehicle cabin, may be used to alert the driver 30 seconds prior to engine shutdown. The engine shutdown system must be capable of allowing the driver to reset the engine shutdown system timer by momentarily changing the position of the accelerator, brake, or clutch pedal, or other mechanism within 30 seconds prior to engine shutdown. Once reset, the engine shutdown system shall restart the engine shutdown sequence described in this paragraph above, and shall continue to do so until the engine shuts down or the vehicle is driven.

6.1.2 **Engine Shutdown System Override**. The engine shutdown system may be overridden, to allow the engine to run continuously at idle, only under the following conditions:

(1) If the engine is operating in power take-off (PTO) mode. The PTO system shall have a switch or a setting that can be switched "on" to override the engine shutdown system and will reset to the "off" position when the vehicle's engine is turned off or when the PTO equipment is turned off. Subject to advance Executive Officer approval, other methods for detecting or activating PTO operation may be allowed; or,

(2) if the vehicle's engine coolant temperature is below 60°F. The engine shutdown system shall automatically be activated once the coolant temperature reaches 60°F or above. The engine coolant temperature shall be measured with the engine's existing engine coolant temperature sensor used for engine protection, if so equipped. Other methods of measuring engine coolant temperature may be allowed, subject to advance Executive Officer approval.

(3) if an exhaust emission control device is regenerating, and keeping the engine running is necessary to prevent aftertreatment or engine damage, the engine shutdown system may be overridden for the duration necessary to complete the regeneration process up to a maximum of 30 minutes. Determination of what constitutes the need for regeneration will be based on data provided by the manufacturer at time of certification. Regeneration events that may require longer than 30 minutes of engine idling to complete shall require advance Executive Officer approval. At the end of the regeneration process, the engine shutdown system shall automatically be enabled to restart the engine shutdown sequence described in subparagraph 11.B.6.1.1. above. A vehicle that uses a regeneration strategy under engine idling operating conditions shall be equipped with a dashboard indicator light that, when illuminated, indicates that the exhaust emission control device is regenerating. Other methods of indicating that the exhaust emission control device is regenerating may be used with advance Executive Officer approval.

(4) if servicing or maintenance of the engine requires extended idling operation. The engine's electronic control module may be set to

temporarily deactivate the engine shutdown system for up to a maximum of 60 minutes. The deactivation of the engine shutdown system shall only be performed with the use of a diagnostic scan tool. At the end of the set deactivation period, the engine's electronic control module shall reset to restart the engine shutdown system sequence described in subparagraph 11.B.6.1.1 above.

6.2 **Exempt Vehicles**. Heavy-duty diesel engines to be used in buses as defined in California Vehicle Code §§ 233, 612 and 642, school buses as defined in California Vehicle Code § 545, recreational vehicles as defined in Health and Safety Code 18010, medium duty vehicles as defined in § 1900(b)(13) of title 13, California Code of Regulations (CCR), military tactical vehicles as defined in §1905 of title 13, CCR, authorized emergency vehicles as defined in California Vehicle Code § 165, armored cars, as defined in California Vehicle Code § 115, and workover rigs, as defined in § 2449 of title 13, CCR are exempted from these requirements.

6.3 **Optional NOx Idling Emission Standard**. In lieu of the engine shutdown system requirements specified in subsection 11.B.6.1 above, an engine manufacturer may elect to certify its new 2008 and subsequent model year heavy-duty diesel engines to an optional NOx idling emission standard of 30 grams per hour. Compliance with this optional standard will be determined based on testing conducted pursuant to the supplemental NOx idling test cycle and procedures specified in section 86.1360-2007.B.4 below. The manufacturer may request an alternative test procedure if the technology used cannot be demonstrated using the procedures in section 86.1360-2007.B.4, subject to advance approval of the Executive Officer. Manufacturers certifying to the optional NOx idling standard must not increase emissions of CO, PM, or NMHC, determined by comparing results from the supplemental NOx idling test cycle and procedures specified in section 86.1360-2007.B.4 below, to emission results from the idle mode of the supplemental steady state test cycle or emission results from idle portions of the transient test cycle for heavy duty diesel engines, respectively specified in sections 86-1360-2007 and 86.1327-98, below. With advance Executive Officer approval, a manufacturer may use other methods of ensuring that emissions of CO, PM, and NMHC are not adversely affected in meeting the optional NOx requirement. Also, manufacturers shall state in their application for certification that meeting the optional NOx idling requirement will not adversely affect the associated emissions of CO, PM and NMHC. An engine manufacturer certifying its engine to the optional NOx idling emission standard must also produce a vehicle label, as defined in subsection 35.B.4, below.

6.4 **Optional Alternatives to Main Engine Idling.** All new 2008 and subsequent model year heavy duty diesel engines may also be equipped with idling emission reduction devices that comply with the compliance requirements specified in title 13, CCR section 2485(c)(3).

7. **Optional Low NOx Emission Standards for Heavy Duty Engines for 2015 and Subsequent Model Year.** Manufacturers may elect to certify heavy duty engines to the following optional low NOx emission standards in lieu of the primary NOx emissions standard of 0.20 g/bhp-hr.

| **Optional Low NOx Exhaust Emission Standards for 2015 and Subsequent Model Year (grams per brake-horsepower-hour or g/bhp-hr)** | | | | |
|---|---|---|---|---|
| | NOx | NMHC or NMHCE | CO | PM |
| Optional Low NOx 0.10 | 0.10 | 0.14 | 15.5 | 0.01 |
| Optional Low NOx 0.05 | 0.05 | 0.14 | 15.5 | 0.01 |
| Optional Low NOx 0.02 | 0.02 | 0.14 | 15.5 | 0.01 |

12. Alternative certification procedures. [§86.080-12] April 17, 1980. [No change.]

13. Alternative durability program. [§86.xxx-13] April 17, 1980. [n/a; light-duty only.]

14. Small-volume manufacturers certification procedures. [§86.xxx-14] April 6, 1994.

**A. Federal provisions**. [A small volume manufacturer shall mean a California small volume manufacturer as defined in 40 CFR §86.001-1 (e), as modified above. Any reference to 10,000 units shall mean 4,500 units in California based on the average number of units sold for the three previous consecutive model years defined in 40 CFR §86.001-1 (e), as modified in Section I.1.A, above.]

1. **§86.094-14** October 25, 2016. Amend as follows:

1.1 Subparagraphs (a) through (c)(1) [No change.]

1.2 Amend subparagraph (c)(2) as follows: Delete the last sentence, "However, the manufacturer is not required to submit the information to the Administrator unless the Administrator requests it."

1.3 Subparagraphs (c)(3) through (c)(3)(ii) [No change.]

1.4 Amend subparagraph (c)(3)(ii)(A) as follows: Manufacturers with aggregated sales of less than 301 motor vehicles and motor vehicles engines per year may use assigned deterioration factors that the Executive Officer 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 Subparagraphs (c)(3)(ii)(B) through (c)(7)(i) [No change.]

1.6 Add the following sentence to subparagraph (c)(7)(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.

1.7 Subparagraph (c)(8) [No change.]

2. **§86.096-14** March 24, 1993. [No change; pertains to evaporative requirements.]

3. **§86.098-14** April 6, 1994. [No change; pertains to evaporative requirements.]

15. NOx plus NMHC and particulate averaging, trading, and banking for heavy-duty engines [§86.xxx-15].

**A. Federal provisions**.

1. **§86.004-15** February 6, 2000. Amend as follows:

1.1 Add the following sentence to subparagraph (a)(1): Except as otherwise noted, references in this subsection to engines, heavy-duty engines, or HDEs shall include medium-duty engines.

1.2 Subparagraphs (a)(2) through (b)(1)(ii)(A) [No change.]

1.3 Subparagraph (b)(1)(ii)(B). Add the following sentence: In the case of medium-duty engines the FEL is subject to the same upper limit as required for heavy-duty engines.

1.4 Subparagraphs (b)(1)(iii) through (b)(1)(iv)(B). [No change.]

1.5 Subparagraph (b)(1)(iv)(C). Add the following sentence: Credits generated before the year 2004 to be used to certify engines in the combined light heavy-duty and medium-duty averaging set, as described in paragraphs (d)(2)(i) and (e)(2), in the year 2004 and later, must have been generated through the sale of engines in California.

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

1.7 Subparagraph (b)(2)(ii) Amend as follows: (ii) The source of the credits to be used to comply with the emission standard if the FEL exceeds the standard, or where credits will be applied if the FEL is less than the emission standard. In cases where credits are being obtained, each engine family involved must state specifically the source (manufacturer/engine family) of the credits being used, including the year of generation of the credits being used and whether the credits were generated from engines sold in California or from 49-state engines. In cases where credits are being generated/supplied, each engine family involved must state specifically the designated use (manufacturer/engine family or reserved) of the credits involved. All such reports shall include all credits involved in averaging, trading or banking.

1.8 Subparagraphs (b)(3) through (c)(1)(ii). [No change.]

1.9 Subparagraph (c)(1)(iii). Add the following sentence: For medium-duty engines certified in the 2004 and 2005 model years, an additional

adjustment to the Std value described in this subparagraph (c)(1)(iii), allowing for certification using Federal certification fuel may be made on an individual engine family basis as determined by the ARB Executive Officer upon application by the engine manufacturer.

1.10 Subparagraphs (c)(2) through (d)(1). [No change.]

1.11 Subparagraph (d)(2). Amend as follows: For NOx plus NMHC credits from diesel-cycle heavy-duty engines:

(i) Heavy heavy-duty engines and medium heavy-duty engines, as defined in §86.004-2, each constitute an averaging set. Light heavy-duty engines, as defined in §86.004-2, for use in vehicles of more than 14,000 pounds gross vehicle weight rating and medium-duty engines, combined constitute an averaging set. Averaging and trading among all diesel-cycle engine families within the same averaging set is allowed.

(ii) Engines intended for use in urban buses constitute a separate averaging set from all other heavy-duty engines. Averaging and trading between diesel cycle bus engine families within the same averaging set is allowed.

1.12 Subparagraphs (e) and (e)(1). [No change.]

1.13 Subparagraph (e)(2) Amend as follows: (e)(2)

(i) For heavy-duty engines, exclusive of urban bus engines, heavy heavy-duty engines and medium heavy-duty engines, as defined in §86.004-2, each constitute an averaging set. Light heavy-duty engines, as defined in §86.004-2, for use in vehicles of more than 14,000 pounds gross vehicle weight rating and medium-duty engines, combined constitute an averaging set. Averaging and trading between diesel-cycle engine families within the same averaging set is allowed.

1.14 Subparagraphs (e)(3) through (f)(3)(ii). [No change.]

1.15 Subparagraph (f)(3)(iii) Add the following sentences: Banked credits generated before the 2004 model year to be applied toward the certification of engines in the combined light heavy-duty and medium-duty averaging set, as described in paragraphs (d)(2)(i) and (e)(2) above, must have been generated through the sale of eligible engines within California. Credits generated before the 2004 model year from engines sold outside of California may not be used to certify light heavy-duty or medium-duty engines for sale in California. Manufacturers subject to the consent decree shall bank and use credits as allowed in their respective consent decrees.[2]

1.16 Subparagraphs (g) through (i). [No change.]

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[2] Seven of the largest heavy-duty diesel engine manufacturers will be implementing measures to reduce emissions beginning October 1, 2002, to meet the requirements of the Heavy-Duty Diesel Engines Settlement Agreements reached with the ARB. The Heavy-Duty Diesel Engine Settlements were agreements reached in response to lawsuits brought by the United States Environmental Protection Agency and violations alleged by the ARB pertaining to excess in-use emissions caused by the use of defeat devices and unacceptable algorithms. Navistar signed its Settlement Agreement on October 22, 1998. Cummins, Detroit Diesel Corporation, Caterpillar, Volvo, Mack and Renault signed their Settlement Agreements on December 15, 1998.

1.17 Subparagraph (j) Credit apportionment. Delete; replace with: At the manufacturer's option, marketable emission reduction credits for NOx plus NMHC, for use in emission reduction credit programs other than ABT, may be generated based upon engine certification to the optional reduced-emission NOx plus NMHC certification standards of section I.11.B.2 of these test procedures except that medium-duty engines certified under title 13, CCR, §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating may not be used as the basis for generating marketable emission reduction credits. Use of any marketable emission reduction credits generated must meet the requirements of the individual emission reduction credit program where the credits will be applied.

(1) For those engine sales used to generate ABT credits, the manufacturer shall report engine sales in the category "ABT-only credits." For those engine sales certified to generate marketable emission reduction credits for NOx, the manufacturer shall report engine sales in the category "non-manufacturer-owned credits."

(i) For engine sales reported as "ABT-only credits," the credits generated must be used solely in the ABT program described in this section.

(ii) The engine manufacturer may declare a portion of engine sales "non-manufacturer-owned credits" and any marketable NOx credits generated based upon such sales would belong to the engine purchaser. For ABT, the manufacturer may not generate any credits for the engine sales reported as "non-manufacturer-owned credits."

(2) Only manufacturer-owned credits resulting from engine sales reported as "ABT-only credits" shall be used in the averaging, trading, and banking provisions described in this section.

(3) Credits shall not be double-counted. Credits used in the ABT program may not be provided to an engine purchaser for use in another program.

(4) Manufacturers shall determine and state the number of engines sold as "ABT-only credits" and "non-manufacturer-owned credits" in the end-of-model year reports required under §86.001-23.

1.18 Subparagraphs (k) and (l). [No change.]

2. **§86.007-15**. January 18, 2001. Amend as follows:

2.1 Introductory paragraph; subparagraphs (a) through (m)(9). [No change.]

2.2 Amend subparagraph (m)(9)(i) through (iv) as follows:

(i) Manufacturers certifying a split diesel engine family to both the pre-2007 (phased-out) and post-2007 (phased-in) emission standards with equally sized subfamilies may exclude the engines within that split family from end-of-year NOx (or NOx+NMHC) ABT calculations, provided that neither subfamily generates credits for use by other engine families, or uses banked

credits, or uses averaging credits from other engine families. All of the engines in that split family must be excluded from the phase-in calculations of Sec. 86.007-11(g)(1) (both from the number of engines complying with the standards being phased-in and from the total number of U.S.-directed production engines.)

(ii) [n/a; Otto-cycle]

(iii) [No change.]

(iv) Notwithstanding the provisions of paragraph (m)(9)(iii) of this section, for split families, the NOx FEL shall be used to determine applicability of the provisions of §86.1360-2007 B.1.2 and B.1.3. and Sec.1370-2007 A.1.4.1(iii) and A.1.4.1(iv), as modified by these test procedures.

2.3 Subparagraph (m)(10). [No change.]

**B. California provisions**

1. For medium-duty diesel-cycle engines certified under title 13, CCR §1956.8(h):

(a) Credits may be generated by an alternative mechanism proposed by the engine manufacturer and approved by the Executive Officer of the ARB. The alternative credit-generating mechanism shall not include any attribute expressly prohibited under the federal ABT program, such as cross-class or cross-fuel trading.

(b) Manufacturers must annually submit a proposed plan for generating credits to the Executive Officer of the ARB and have it approved prior to sale of engines of that model year in California.

2. A manufacturer may not include an engine family certified to the optional NOx emissions standards in the ABT programs for NOx but may include it for particulates.

16. Prohibition of defeat devices. [§86.004-16] July 13, 2005. [No change.]

17. On-board diagnostics for engines used in applications less than or equal to 14,000 pounds GVWR. [§86.007-17]
[Delete replace with: All heavy-duty diesel cycle engines used in vehicles up to 14,000 pounds GVW must have an on-board diagnostic system as required in title 13, CCR §1968 et seq, as applicable.]

18. On-board diagnostics for engines used in applications greater than 14,000 pounds GVWR. [§86.010-18]
[Delete replace with: All heavy-duty diesel cycle engines used in vehicles greater than 14,000 pounds GVWR must have an on-board diagnostic system as required in title 13, CCR §1971.1 et seq, as applicable.]

19. §86.xxx-19. [Reserved.]

20. Incomplete vehicles, classification. [§86.085-20] April 28, 2014. [No change.]

21. Application for certification. [§86.xxx-21]

**A. Federal provisions.**

1. **§86.004-21** April 28, 2014. Amend as follows:

1.1 Subparagraphs (a) through (l). [No change.]

1.2 Delete subparagraph (m).

1.2 Subparagraph (n). [No change.]

2. **§86.007-21** April 28, 2014. Amend as follows:

2.1 Subparagraphs (a) through (l). [No change.]

2.2 Delete subparagraph (m).

2.3 Subparagraph (n). [No change.]

2.4 Amend subparagraph (o) as follows: For 2005 and subsequent model year diesel heavy-duty engines, the manufacturer must provide the following additional information pertaining to the supplemental steady-state test conducted under § 86.1360-2007:

2.4.1 Subparagraph (o)(1). [No change.]

2.4.2 Amend subparagraph (o)(2) as follows: For engines subject to the MAEL (see §86.1360-2007B.1), brake specific gaseous emission data for each of the 12 non-idle test points (identified under §86.1360-2007(b)(1)) and the 3 selected test points (identified under §86.1360-2007(b)(2));

2.4.3 Amend subparagraph (o)(3) as follows: For engines subject to the MAEL (see §86.1360-2007B.1), concentrations and mass flow rates of all regulated gaseous emissions plus carbon dioxide;

2.4.4 Subparagraph (o)(4) and (o)(5). [No change.]

2.4.5 Amend subparagraph (o)(6) as follows: For engines subject to the MAEL (see §86.1360-2007B.1), a statement that the engines will comply with the weighted average emissions cap and interpolated values comply with the emission testing caps specified in §86.1360-2007B.1 for the useful life of the engine. The manufacturer also must maintain records at the manufacturer's facility which contain a detailed description of all test data, engineering analyses, and other information which provides the basis for this statement, where such information exists. The manufacturer must provide such information to the Executive Officer upon request.

2.4.6 Subparagraph (o)(7). [Reserve.]

2.5 Amend subparagraph (p) as follows:

2.5.1. (1) The manufacturer must provide a statement in the application for certification that the diesel heavy-duty engine for which certification is being requested will comply with the applicable Not-To-Exceed Limits specified in §86.1370-2007A.1.4 when operated under all conditions which may reasonably be expected to be encountered in normal vehicle operation and use. The manufacturer also must maintain records at the manufacturer's facility which

contain all test data, engineering analyses, and other information which provides the basis for this statement, where such information exists. The manufacturer must provide such information to the Executive Officer upon request.

2.5.2. Subparagraph (p)(2). [No change.]

2.5.3. Amend subparagraph (p)(3) as follows: For each engine model and/or horsepower rating within an engine family for which a manufacturer is applying for a NTE deficiency(ies) under the provisions of §86.1370-2007B.3, the manufacturer's application for an NTE deficiency(ies) must include a complete description of the deficiency, including but not limited to: the specific description of the deficiency; what pollutant the deficiency is being applied for, all engineering efforts the manufacturer has made to overcome the deficiency, what specific operating conditions the deficiency is being requested for (i.e., temperature ranges, humidity ranges, altitude ranges, etc.), a full description of the auxiliary emission control device(s) which will be used to maintain emissions to the lowest practical level; and what the lowest practical emission level will be.

2.6 Subparagraph (q). [No change.]

**B. California provisions**

1. For 2004 and subsequent model year medium-duty ultra-low-emission and super-ultra-low emission vehicles and engines not powered exclusively by diesel fuel, the manufacturer shall submit projected California sales and fuel economy data two years prior to certification.

2. **Heavy-Duty Diesel Engine Idling Requirements**.

2.1 For 2008 and subsequent model year heavy-duty diesel engines, the manufacturer must provide a statement in the application for certification that the heavy-duty diesel engine for which certification is being requested will comply with the automatic engine shutdown requirements to control idle emissions as specified in subsection 11.B.6.1. If the heavy-duty diesel engine for which certification is being requested is explicitly designed for exempt vehicles, per the provisions in 11.B.6.2, then the manufacturer must also provide a statement in its application for certification so stating.

2.2 A manufacturer that elects to certify engines to the optional NOx idling emission standard, specified in subsection 11.B.6.3, must provide in the application for certification information pertaining to the NOx idling emission certification test conducted under 86.1360-2007.B.4, below, including emissions data for total particulate matter, non-methane hydrocarbons or total hydrocarbons, oxides of nitrogen, carbon monoxide, and carbon dioxide in grams per hour, the test load in brake-horsepower, and engine test speeds in revolutions per minute for both mode 1 and mode 2 testing. With advance Executive Officer approval, a manufacturer may use an alternative procedure to show compliance with the optional NOx idling emission standard. Regardless of the procedure used, the manufacturer shall also provide the appropriate labels to be affixed to the vehicle on which the engine is going to be installed as required

in subsection 35.B.4, below. The manufacturer must maintain records at the manufacturer's facility that contain all test data, engineering analyses, and other information which provide the basis for the compliance statement, where such information exists. The manufacturer must provide such information to the Executive Officer within 30 days upon request.

2.3 If the heavy-duty diesel engine for which certification is being requested incorporates any of the alternative idle emission control strategies contained in title 13, CCR, section 2485(c)(3), then the manufacturer must provide in its application for certification a description of the alternative strategy or technology including the type, brand name, model identification number, and where applicable emissions data and power rating. In addition, the manufacturer must also provide the appropriate labels to be affixed to the outside of the vehicle as required in subsections 35.B.4. If the alternative technology is a fuel-fired heater, then the manufacturer must provide with the application for certification the information required under subsection H.4.4, Part I of the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated by reference in title 13, CCR, section 1961, or the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures 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 title 13, CCR, section 1961.2, as applicable.

22. Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification 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. **§86.098-23**. April 28, 2014.

1.1 Subparagraphs (a) through (b)(1)(i) [No change.]

1.2 Add the following sentence to subparagraph (b)(1)(ii): 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.

1.3 Subparagraphs (b)(2) through (h)(2) [No change.]

1.4 Amend subparagraph (h)(3) as follows:

(h)(3)(i) These reports shall be submitted within 90 days of the end of the model year to: Chief, Emissions Compliance, Automotive Regulations and Science Division, California Air Resources Board, 9480 Telstar Avenue, Ste. #4, El Monte, California 91731.

1.5 Subparagraphs (h)(3)(ii) through (m) [No change.]

2. **§86.001-23.** April 28, 2014. [No change, except that the amendments indicated for §86.098-23 above still apply.]

3. **§86.007-23.** April 28, 2014. [No change, except that the amendments indicated for §86.098-23 above still apply.]

24. Test vehicles and engines. [§86.xxx-24]

**A. Federal provisions.**

1. **§86.001-24**. October 22, 1996. [No change except that the reference in subparagraph (e)(2) to 10,000 light-duty vehicles, light-duty trucks, heavy-duty vehicles and heavy-duty engines shall mean 4,500 units based on the average number of vehicles or engines sold for the three previous consecutive model years for which a manufacturer seeks certification in California.]

25. Maintenance. [§86.xxx-25]

**A. Federal provisions.**

1. **§86.004-25**. October 25, 2016.

1.1 Paragraph (a) through subparagraph (b)(3)(v)(H). [No change.]

1.2 Add the following title (plus spacing) to the beginning of subparagraph (b)(4):

(4) Minimum Maintenance Intervals for Diesel-Cycle Heavy-Duty Engines:

1.3 Delete and replace subparagraph (b)(4)(i) as follows:

(i) For 2021 and earlier model-year diesel-cycle heavy-duty engine families, and for 2022 and subsequent model-year diesel-cycle heavy-duty engine families that are certified for use in vehicles with a GVWR less than or equal to 14,000 pounds, that are certified for use in hybrid vehicles exclusively, that are certified for use in dual fuel vehicles, or that are not certified on only diesel fuel, the adjustment, cleaning, repair, or replacement of the items listed in paragraphs (b)(4)(i) (A)-(D) of this section shall initially not occur before 50,000 miles (or 1,500 hours) of use and thereafter not more frequently than at intervals of 50,000-miles (or 1,500-hours).

For 2022 and subsequent model-year diesel-cycle heavy-duty engine families that are certified for use in vehicles with a GVWR greater than 14,000 pounds

on only diesel fuel, including engine families that have concurrent applications in both dedicated diesel-fueled vehicles are hybrid vehicles:

- *Adjustment or cleaning frequency.* The frequency of manufacturer scheduled adjustment or cleaning for the items listed in paragraphs (b)(4)(i) (A)-(D) shall be limited by the same minimum maintenance intervals as for 2021 or earlier model-year diesel-cycle heavy-duty engine families as stated in this paragraph (b)(4)(i).

- *Repair or replacement frequency*. The frequency of manufacturer scheduled repair or replacement for the emission-related components and systems listed in paragraph (b)(4)(vi) shall be limited by the minimum maintenance intervals stated therein. These maintenance intervals do not apply to parts identified in 1037.120 for heavy-duty vehicles certified to the GHG emission standards of section 95663, title 17, CCR. The maintenance provisions for the GHG-related parts in 1037.120 for heavy-duty vehicles certified to the GHG emission standards of section 95663, title 17, CCR, are specified in 1037.125 of that same section.

(A) Exhaust gas recirculation system related filters and coolers.
(B) Crankcase ventilation valves and filters.
(C) Fuel injector tips (cleaning only).
(D) DEF filters.

1.4 Subparagraph (b)(4)(ii). [No change.]

1.5 Delete and replace subparagraph (b)(4)(iii) as follows:

(iii) For 2021 and earlier model-year diesel-cycle heavy-duty engine families, and for 2022 and subsequent model-year diesel-cycle heavy-duty engine families that are certified for use in vehicles with a GVWR less than or equal to 14,000 pounds, that are certified for use in hybrid vehicles exclusively, that are certified for use in dual fuel vehicles, or that are not certified on only diesel fuel, the adjustment, cleaning, repair, or replacement of the items listed in paragraphs (b)(4)(iii) (A)-(G) of this section shall initially not occur before 100,000 miles (or 3,000 hours) of use and thereafter not more frequently than at intervals of at least 100,000-miles (or 3,000-hours) for light heavy-duty diesel engines, or, thereafter at intervals of at least 150,000 miles (or 4,500 hours) for medium and heavy heavy-duty diesel engine families.

For 2022 and subsequent model-year diesel-cycle heavy-duty engines that are certified for use in vehicles with a GVWR greater than 14,000 pounds on only diesel fuel, including engine families that have concurrent applications in both dedicated diesel-fueled vehicles and hybrid vehicles:

- *Adjustment or cleaning frequency.* The frequency of manufacturer scheduled adjustment or cleaning for the items listed in paragraphs (b)(4)(iii) (A)-(G) shall be limited by the same minimum maintenance intervals as for 2021 or

earlier model-year diesel-cycle heavy-duty engine families as stated in this paragraph (b)(4)(iii).

- *Repair or replacement frequency.* The frequency of manufacturer scheduled repair or replacement for the emission-related components and systems listed in paragraph (b)(4)(vi) shall be limited by the minimum maintenance intervals stated therein. These maintenance intervals do not apply to parts identified in 1037.120 for heavy-duty vehicles certified to the GHG emission standards of section 95663, title 17, CCR. The maintenance provisions for the GHG-related parts in 1037.120 for heavy-duty vehicles certified to the GHG emission standards of section 95663, title 17, CCR, are specified in 1037.125 of that same section.

(A) Fuel injectors.
(B) Turbocharger.
(C) Electronic engine control unit and its associated sensors and actuators.
(D) Particulate trap or trap oxidizer systems including related components (adjustment and cleaning only for filter element, scheduled replacement of the filter element is not allowed during the useful life).
(E) Exhaust gas recirculation system (including all related control valves, and tubing) except as otherwise provided in paragraph (b)(4)(i)(A) of this section.
(F) Catalytic converter (adjustment and cleaning only for catalyst beds, scheduled replacement of the bed is not allowed during the useful life).
(G) Any other add-on emissions-related component (i.e., a component whose sole or primary purpose is to reduce emissions or whose failure will significantly degrade emissions control and whose function is not integral to the design and performance of the engine.)

1.6 Subparagraphs (b)(4)(iv) through (b)(4)(v). [No change.]

1.7 Add new subparagraph (b)(4)(vi) as follows:

(vi) For 2022 and subsequent model-year diesel-cycle heavy-duty engine families certified on only diesel fuel for use in vehicles with a GVWR greater than 14,000 pounds, repair and replacement for the criteria pollutant emission-related components and systems listed below shall not occur before the mileage intervals specified in the following table, and thereafter not more frequently than at least those same intervals. Manufacturers may not schedule maintenance based on any other metric (e.g., hours of operation, calendar years, months, etc.) except as specifically provided in the table below:

| Component or System | Minimum Repair / Replacement Interval | | |
|---|---|---|---|
| | **Light Heavy-Duty Diesel Engine** 14,000 lbs. < GVWR ≤ 19,500 lbs. | **Medium Heavy-Duty Diesel Engine** 19,500 lbs. < GVWR ≤ 33,000 lbs. | **Heavy Heavy-Duty Diesel Engine** GVWR > 33,000 lbs. |
| Exhaust Gas Recirculation (EGR) System (valves & cooler - not including hoses) | Not Replaceable[1,2] | Not Replaceable[1,2] | Not Replaceable[1,2] |
| Exhaust Gas Recirculation (EGR) System (other than valves & cooler) | 110,000 miles, or 3 years | 185,000 miles | 435,000 miles |
| Crankcase Ventilation System | 50,000 miles | 60,000 miles, or 2,000 hours, or 1 year | 60,000 miles, or 2,000 hours, or 1 year |
| Diesel Exhaust Fluid (DEF) Filter | 110,000 miles, or 2 years | 125,000 miles, or 3,000 hours, or 10 years | 125,000 miles, or 3,000 hours |
| Fuel Injectors | 110,000 miles | 185,000 miles | 435,000 miles |
| Turbochargers | Not Replaceable[1,2] | Not Replaceable[1,2] | Not Replaceable[1,2] |
| Electronic Control Unit, Sensors, and Actuators | 100,000 miles, or 3,000 hours | 150,000 miles, or 4,500 hours | 150,000 miles, or 4,500 hours, or 5 years |
| Diesel Particulate Filter System (element only) | Not Replaceable[1] | Not Replaceable[1] | Not Replaceable[1] |
| Diesel Particulate Filter System (other than element) | 110,000 miles | 185,000 miles, or 3 years | 435,000 miles, or 3 years |
| Catalytic Converter (bed only) | Not Replaceable[1] | Not Replaceable[1] | Not Replaceable[1] |
| Catalytic Converter (other than catalyst bed) | 110,000 miles | 185,000 miles | 435,000 miles |
| Any other add-on or new technology emission-related component or system whose primary purpose is to reduce emissions or whose failure will significantly degrade emissions control | 110,000 miles, or 3,300 hours[3] | 185,000 miles, or 5,550 hours[3] | 435,000 miles, or 13,050 hours[3] |

1. For components or systems designated in the table as "Not Replaceable," manufacturers shall not schedule any repair / replacement maintenance intervals throughout the applicable useful life of the heavy-duty diesel engine, defined in § 86.004-2 of the California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles, last amended April 18, 2019, except as noted in (b)(7)(i) of this section.
2. Sensors and actuators are included only if they are integral to these assemblies and cannot be repaired without removing or replacing the assembly. Otherwise sensors and actuators are subject to the maintenance intervals specified in the table for Electronic Control Units, Sensors, and Actuators.
3. Manufacturers may request more frequent repair / replacement maintenance intervals for add-on or new technology emission-related components provided that the manufacturer demonstrates to the Executive Officer's satisfaction that such intervals are technologically necessary and appropriate.

1.8 Subparagraphs (b)(5) through (b)(6)(ii)(F). [No change.]

1.9 Add the following phrase to the last sentence of subparagraph (b)(6)(iii): … or California Vehicle Code §27156, et seq.

1.10 Subparagraphs (b)(7)(i) and (b)(7)(ii). [No change.]

1.11 Add the following sentence to subparagraph (b)(7)(iii): The Executive Officer may also provide the manufacturer a hearing in accordance with title 17, CCR, §60055.1, et seq., with respect to such issue.

1.12 Paragraphs (c) through (h). [No change.]

1.13 Delete and replace paragraph (i) as follows:

(i) Notwithstanding the provisions of paragraphs (b)(4) and (6) of this section, manufacturers may schedule replacement or repair of particulate trap elements (or trap oxidizer elements), catalytic converter beds (including NOx adsorber, diesel oxidation catalyst, and selective catalyst reduction beds), turbochargers, and exhaust gas recirculation systems provided that the manufacturer demonstrates to the Executive Officer's satisfaction that the repair or replacement will be performed according to the schedule and the manufacturer pays for the repair or replacement.

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] January 18, 2001.

**A. Federal provisions.**

1. **§86.004-28**. October 25, 2016. Amend as follows:

1.1 Subparagraphs (a) through (c)(4)(i) [No change.]

1.2 Amend subparagraph (c)(4)(ii) as follows: [No change, except that diesel-cycle smoke testing shall only apply to petroleum-fueled diesel-cycle engines.]

1.3. Subparagraph (c)(4)(iii)(A) [n/a; Otto-cycle engines.]

1.4 Subparagraph (c)(4)(iii)(B): [No change, except that the exhaust emission results for formaldehyde exhaust emission results for methanol-fueled engines and vehicles, ultra-low emission vehicles and super-ultra-low emission vehicles shall also be adjusted by the appropriate deterioration factor (through addition or multiplication as the case may be.]

1.5 Amend subparagraph (c)(4)(iii)(B)(*3*) as follows: For petroleum-fueled diesel cycle HDEs only: [No change to remainder of paragraph.]

1.6 Subparagraphs (c)(iv) through (i). [No change.]

**B. California provisions.**

1. **Deterioration factor for exhaust emissions.**

1.1 **Additive deterioration factor.** Except as specified in paragraph B.1.2 of this section, use an additive deterioration factor for exhaust emissions.

An additive deterioration factor for a pollutant is the difference between exhaust emissions at the end of the useful life and exhaust emissions at the low-hour test point. In these cases, adjust the official emission results for each tested engine at the selected test point by adding the factor to the measured emissions. If the factor is less than zero, use zero. Additive deterioration factors must be specified to one more decimal place than the applicable standard.

1.2 **Multiplicative deterioration factor.** Use a multiplicative deterioration factor if good engineering judgment calls for the deterioration factor for a pollutant to be the ratio of exhaust emissions at the end of the useful life to exhaust emissions at the low-hour test point. For example, if you use aftertreatment technology that controls emissions of a pollutant proportionally to engine-out emissions, it is often appropriate to use a multiplicative deterioration factor. Adjust the official emission results for each tested engine at the selected test point by multiplying the measured emissions by the deterioration factor. If the factor is less than one, use one. A multiplicative deterioration factor may not be appropriate in cases where testing variability is significantly greater than engine-to-engine variability. Multiplicative deterioration factors must be specified to one more significant figure than the applicable standard.

29. Testing by the Administrator. [§86.091-29]. April 28, 2014. [No change.]

30. Certification. [§86.xxx-30]

**A. Federal provisions**

1. **§86.004-30**. April 28, 2014. Amend as follows:

1.1 Subparagraphs (a) through (a)(2). [No change.]

1.2 Add the following sentence to subparagraph (a)(3)(i). For heavy-duty engines certified under the provisions of section I.11.B.4 of these test procedures two certificates will be issued, one for each fueling mode. [No change to remainder of paragraph.]

1.3 Subparagraphs (a)(3)(ii) through (b)(2). [No change.]

1.4 Subparagraph (b)(3). Add the following sentence: If, after a review of the request and supporting data, the Executive Officer finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with title 17, CCR, §60040, et seq., with respect to such issue.

1.5 Subparagraph (b)(4). [No change.]

1.6 Subparagraph (b)(4)(i). Add the following phrase at the beginning of the paragraph: Request a hearing under title 17, CCR, §60040, et seq.; or…

1.7 Subparagraph (b)(4)(ii) through (b)(5). No change.

1.8 Subparagraph (b)(5)(i). Add the following phrase at the beginning of the paragraph: Request a hearing under title 17, CCR, §60040, et seq.; or…

1.9. Subparagraph (b)(5)(ii) through (c)(5). [No change.]

1.10 Subparagraph (c)(5)(i). Add the following phrase at the beginning of the paragraph: Be made only after the manufacturer concerned has been

offered an opportunity for a hearing conducted in accordance with title 17, CCR, §60040, et seq. hereof; and …

1.11 Subparagraph (c)(5)(ii). [No change.]

1.12 Subparagraph (c)(6). Add the following sentence: The manufacturer may request in the form and manner specified in paragraph (b)(3) of this section that any determination made by the Executive Officer under paragraph (c)(1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with title 17, CCR, §60040, et seq. If the Executive Officer finds, after a review of the request and supporting data, that the request raises a substantial factual issue, he will grant the request with respect to such issue.

1.13 Subparagraphs (d) through (e). [No change.]

1.14 Delete subparagraph (f) and replace with the following: All medium-duty diesel cycle engines used in vehicles up to 14,000 pounds GVW must have an on-board diagnostic system as required in title 13, CCR §1968 et seq, as applicable.

2. **§86.007-30**. October 25, 2016. Amend as follows:

1.1 Subparagraphs (a) through (a)(2). [No change.]

1.2 Add the following sentence to subparagraph (a)(3)(i). For heavy-duty engines certified under the provisions of section I.11.B.4 of these test procedures two certificates will be issued, one for each fueling mode. [No change to remainder of paragraph.]

1.3 Subparagraphs (a)(3)(ii) through (b)(2). [No change.]

1.4 Subparagraph (b)(3). Add the following sentence: If, after a review of the request and supporting data, the Executive Officer finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with title 17, CCR, §60040, et seq., with respect to such issue.

1.5 Subparagraph (b)(4). [No change.]

1.6 Subparagraph (b)(4)(i). Add the following phrase at the beginning of the paragraph: Request a hearing under title 17, CCR, §60040, et seq.; or…

1.7 Subparagraph (b)(4)(ii) through (b)(5). [No change.]

1.8 Subparagraph (b)(5)(i). Add the following phrase at the beginning of the paragraph: Request a hearing under title 17, CCR, §60040, et seq.; or…

1.9. Subparagraph (b)(5)(ii) through (c)(5). [No change.]

1.10 Subparagraph (c)(5)(i). Add the following phrase at the beginning of the paragraph: Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with title 17, CCR, §60040, et seq. hereof; and …

1.11 Subparagraph (c)(5)(ii). [No change.]

1.12 Subparagraph (c)(6). Add the following sentence: The manufacturer may request in the form and manner specified in paragraph (b)(3) of this section that any determination made by the Executive Officer under paragraph (c)(1) of this section to withhold or deny certification be reviewed in a

hearing conducted in accordance with title 17, CCR, §60040, et seq. If the Executive Officer finds, after a review of the request and supporting data, that the request raises a substantial factual issue, he will grant the request with respect to such issue.

1.13 Subparagraphs (d) through (e). [No change.]

1.14 Delete subparagraph (f) and replace with the following: All medium-duty diesel cycle engines used in vehicles up to 14,000 pounds GVW must have an on-board diagnostic system as required in title 13, CCR §1968 et seq, as applicable.

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. **86.095-35** October 25, 2016.

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:

1.3.1 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 diesel engines.” It may also state that the engine conforms to any applicable federal or Canadian emission standards for new heavy-duty diesel engines.

1.3.2 For 2004 through 2006 model year heavy heavy-duty diesel-fueled, dual-fuel, and bi-fuel engines to be used in urban buses that are certified to the optional reduced emission standards and are sold to any transit agency exempted under paragraphs (c)(8) and (d)(7), title 13, CCR, §1956.2 from the requirements of paragraphs (c)(5) and (d)(4), title 13, CCR §1956.2.

“This engine conforms to California regulations applicable to XXXX model year new urban bus or heavy-duty diesel engines

and is certified to a NOx plus NMHC optional reduced-emission standards of XXX g/bhp-hr (for optional reduced-emission standards specify between 0.3 and 1.8, inclusive, at 0.3 b/bhp-hr increments, and a particulate matter standards of 0.01 g/bhp-hr)."

1.3.3 For all other 2004 through 2006 model year heavy-duty diesel cycle engines, including those used in urban buses, that are certified to the optional reduced-emission standards, the label shall contain the following statement:

"This engine conforms to California regulations applicable to XXXX model year new (specify urban bus or heavy-duty diesel) engines and is certified to a NOx plus NMHC optional reduced-emission standards of XXX g/bhp-hr (for optional reduced-emission standards specify between 0.3 and 1.8, inclusive, at 0.3 b/bhp-hr increments, and a particulate matter standard of 0.03 g/bhp-hr, 0.02 g/bhp-hr, or 0.01 g/bhp-hr)."

1.4 Subparagraphs (a)(3)(iii)(I) through (i). [No change.]

**B. California provisions**.

1. For 2004 and later model year heavy-duty diesel engines certified under the requirements of title 13, CCR, §1956.8(a)(3), the statement of compliance requirements of this subsection shall be repeated for each of the two fueling modes of operation. Appended to the statement for the lower emitting fueling mode of operation shall be the following sentence:

"This certification is valid only while operating on ___ (indicate the fuel or fuel combination under which this mode of operation was certified) fuel. Operation using any other fueling mode will result in significant increases in exhaust emissions and significantly reduce engine performance."

2. Manufacturers may elect to use a supplemental label in addition to the original label if there is not sufficient space to include all the required information. The supplemental label must conform to all specifications as the original label. In the case that a supplemental label is used, the original label shall be numbered "1 of 2" and the supplemental label shall be numbered "2 of 2."

3. Statements shall not be used on labels placed on engines that, in fact, do not comply with all applicable California regulations.

4. **Vehicle Labels for Heavy-Duty Diesel Engine Idling Requirements.** For each 2008 and subsequent model year heavy-duty diesel engine certified to the optional NOx idling emission standard pursuant to paragraph 11.B.6.3 or equipped with a certified/verified auxiliary power system (APS) pursuant to title 13, CCR,

section 2485(c)(3)(A), a single label shall be produced and affixed, as applicable, on each vehicle equipped with such heavy-duty diesel engine.

4.1 The labeling requirements for engine manufacturers, aftermarket APS manufacturers and installers, and original equipment manufacturers are as follows:

4.1.1 Engine manufacturers. The engine manufacturer that has certified an engine to the optional NOx idling emission standard pursuant to paragraph 11.B.6.3, or certified/verified an APS pursuant to title 13, CCR, section 2485(c)(3)(A), shall produce the appropriate label for each new engine or APS pursuant to paragraph 35.B.4.2, below. The label shall be affixed on the outside of the vehicle pursuant to paragraph 35.B.4.3 by the original equipment manufacturer.

4.1.2 Aftermarket APS manufacturers and installers. An aftermarket APS manufacturer that has certified/verified an APS pursuant to title 13, CCR, section 2485(c)(3)(A), shall produce the appropriate label for each APS system pursuant to paragraph 35.B.4.2, below. The label shall be affixed on the outside of the vehicle pursuant to paragraph 35.B.4.3 by the party that is responsible for installing the APS on the vehicle.

4.1.3 Original equipment manufacturer. An original equipment manufacturer that has certified an engine to the optional NOx idling emission standard pursuant to paragraph 11.B.6.3, or certified/verified an APS pursuant to title 13, CCR, section 2485(c)(3)(A), shall produce and affix the appropriate label on the outside of the vehicle pursuant to paragraphs 35.B.4.2 or 35.B.4.3, whichever is applicable.

4.2 **Label Format.** Figure 1 shows a facsimile of the label format for an engine certified to the optional NOx idling emission standard pursuant to paragraph 11.B.6.3. Figure 2 shows a facsimile of the label format for an engine in a certified/verified APS pursuant to title 13, CCR, section 2485(c)(3)(A). The engine manufacturer, APS manufacturer or original equipment manufacturer, whichever is applicable, that produces and affixes the label on the vehicle must ensure that the label has the following characteristics:


Figure 1


Figure 2

4.2.1 Oval shape.

4.2.2 Dimensions of no less than 6 inches wide by 4 inches high.

4.2.3 The color of the outer and inner ellipses shall be dark blue and the stars in red. The background of the label shall be light blue in color. The size of the stars shall be equal to the size of the characters as specified in paragraph 35.B.4.2.4 below.

4.2.4 A vehicle equipped with an engine that is certified pursuant to paragraph 11.B.6.3 shall have a label with the word “CERTIFIED,” and below it the phrase “CLEAN IDLE,” as shown in Figure 1. A vehicle equipped with an APS certified/verified pursuant to title 13, CCR, section 2485(c)(3)(A) shall have a label with the word “VERIFIED,” and below it the phrase “CLEAN APS,” as shown in Figure 2. The label information shall be written in the English language with sans serif font, black in color, and in upper case letters. The size of the font shall be at least 7/16 inch (or 32 points) and the spacing of the fonts must be such that the longest phrase (for example, “CLEAN IDLE”) extends from the left edge to the right edge of the inner edge of the inner ellipse, without touching the edges. The label information shall be centrally aligned, both vertically and horizontally.

4.2.5 A hologram as shown in Figure 3 shall be embedded within the proposed label. The hologram must cover the entire label. The hologram shall have the phrase “Clean Skies” repeatedly written from edge to edge of the label boundaries and each phrase shall be separated by a circular bullet. The position of the circular bullet in each line shall be exactly above the space between the words “Clean” and “Skies” of the line below. The color of the font shall be orange. The font size“ shall be less than or equal to a quarter of the font size of the phrase “CLEAN IDLE” or “CLEAN APS” as specified in subsection 35.B.4.2.4, above. The hologram shall have the map of the State

of California, in orange color, overlaid over the text and positioned in the center of the label as shown in Figure 3, below.

4.3 Label Location and Attachment Requirements

4.3.1 The appropriate label shall be permanently affixed to the exterior on the driver's side of the hood, in an area within one foot by one foot from the top and front edges of the hood. If such an attachment is not feasible, the label may be attached at a different location subject to advance approval by the Executive Officer.

4.3.2 Each label must be affixed in such a manner that it can not be removed without destroying or defacing the label. The label must not be affixed to any vehicle component that can easily be detached from the vehicle.

4.3.3 The label and any adhesives used must be designed to withstand, for a period of 10 years, typical environmental conditions. Typical environmental conditions include, but are not limited to, exposure to extreme heat or cold, moisture, engine fuels, lubricants and coolants.

4.4 The party that certifies/verifies the engine pursuant to paragraph 11.B.6.3 or the APS pursuant to title 13, CCR, section 2485(c)(3)(A) shall be the ultimate party responsible for ensuring that the labels are correctly produced. Samples of labels produced pursuant to this subsection must be submitted to the Executive Officer with the applicable certification or verification application.

4.5 Labels on vehicles may also be applied by original equipment manufacturers, distributors, or dealers. However, the party that certified the engine or the APS and produced the labels remains the ultimate party responsible for ensuring that the labels are correctly administered. If the labels are administered by the original equipment manufacturer, dealer, or distributor, the producer of the label shall include its name and a serial number on the label. The location of the producer's name and serial number on the label shall be written in the lower part of the label, in the space vertically centered between the label wording and the inner ellipses, and the font must contrast the label

background. The serial numbers of the labels administered must be recorded by the original equipment manufacturer, distributor, or dealer and reported to the party responsible for producing the labels. This information shall be maintained by the party responsible for producing the labels for a period of 10 years, and shall be made available to the Executive Officer upon request.

4.6 A heavy-duty diesel engine that has been certified pursuant to subsection 11.B.6.3 shall not be modified or altered unless said modification or alteration has been approved by the Executive Officer pursuant to title 13 CCR sections 2220 through 2225.

4.7 An idling emission reduction device or system that has been certified/verified pursuant to title 13, CCR, section 2485(c)(3)(A) shall not be modified or altered unless said modification or alteration has been approved by the Executive Officer pursuant to title 13 CCR sections 2470 through 2476.

5. For 2015 and subsequent model year heavy-duty and medium-duty diesel cycle engines certified to the Optional Low NOx Engine emission standards in subparagraph A.11.B.7., the label shall contain the following statement: "This engine conforms to California regulations applicable to XXXX model year heavy-duty diesel 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] October 25, 2016. [No change.]

38. Maintenance instructions. [§86.xxx-38]

**A. Federal provisions**

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.

2.1 Subparagraphs (a) through (f). [No change.]

2.2 Subparagraph (g). Delete; replace with: Manufacturers of heavy-duty diesel engines used in vehicles weighing 14,000 pounds GVW and less must comply with the motor vehicle service information requirements set forth in title 13, CCR §1969.

2.3 Subparagraph (h). [No change.]

2.4 Amend subparagraph (i) as follows: Through model year 2013, for each new diesel-fueled engine subject to the standards prescribed in title 13, CCR §1956.8(a), §1956.8(h), and Sec. 86.007-11, as applicable, the manufacturer shall furnish or cause to be furnished to the ultimate purchaser a statement that "This engine must be operated only with ultra low sulfur diesel fuel (that is, diesel fuel meeting ARB specifications for highway diesel fuel, including a 15 ppm sulfur cap)."

2.5 Subparagraph (j). Delete; replace with: Manufacturers of heavy-duty diesel engines used in vehicles over 14,000 pounds GVW must comply with the motor vehicle service information requirements set forth in title 13, CCR §1969.

39. Submission of maintenance instructions. [§86.079-39] September 8, 1977. [No change.]

40. Heavy-duty engine rebuilding practices. [§86.xxx-40]

**A. Federal Provisions.**

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 California Vehicle Code section 27156, et seq.

1.2 Subparagraphs (a) through (e). [No change.]

## II. TEST PROCEDURES

### Subpart I - Emission Regulations for New Diesel-Fueled Heavy-Duty Engines; Smoke Exhaust Test Procedure

86.884-1 General Applicability. September 21, 1994.

The provisions of this subpart are applicable to new petroleum-fueled diesel heavy-duty engines beginning with the 1984 model year.

The provisions of this subpart are not applicable to new heavy-duty diesel gaseous-fuel engines and those gaseous-fuel engines derived from diesel engines, except dual-fuel and multi-fuel engines which use petroleum fuel.

86.884-2 Definitions. November 16, 1983.
86.884-3 Abbreviations. November 16, 1983.
86.884-4 Section numbering. September 21, 1994.
86.884-5 Test Procedures. April 11, 1989.
86.884-6 Fuel specifications. April 11, 1989.
86.884-7 Dynamometer operation cycle for smoke emission tests. September 5, 1997.
86.884-8 Dynamometer and engine equipment. July 13, 2005.
86.884-9 Smoke measurement system. September 5, 1997.
86.884-10 Information. July 13, 2005.
86.884-11 Instrument checks. December 10, 1984.
86.884-12 Test run. July 13, 2005.
86.884-13 Data analysis. September 5, 1997.
86.884-14 Calculations. January 15, 2004.

## Subpart N - Exhaust Test Procedures for Heavy-duty Engines

86.1301 Scope; applicability. October 25, 2016.
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.

86.1360 Supplemental emission test; test cycle and procedures. April 28, 2014.

### A. Federal provisions

1. Introductory paragraph. [No change.]

2. Amend subparagraph (a) as follows: Applicability. This section applies to 2005 and subsequent model year heavy duty diesel engines.

3. Amend subparagraph (b) as follows:

3.1 Amend subparagraph (b)(1) as follows: The ramped-modal procedures described in §86.1362 apply to 2007 and subsequent model year heavy duty diesel engines. See B.1. of this section for the procedures applicable to 2005 and 2006 model year engines.

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

4. Subparagraph (c). [No change.]

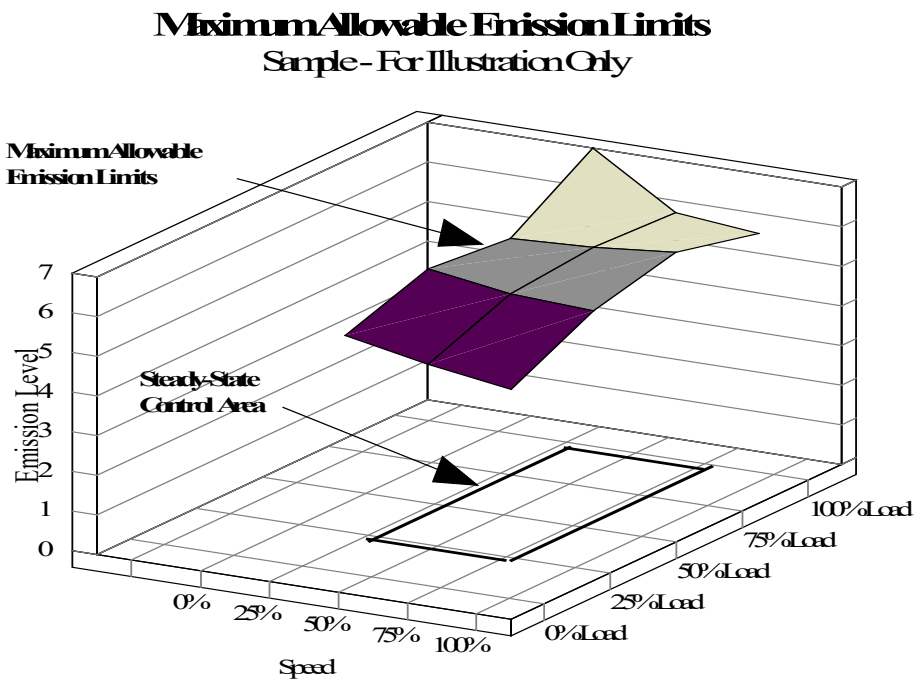
5. Subparagraph (d). Determining the control area. [No change.]

6. Subparagraph (e). [Reserve.]

7. Amend subparagraph (f) as follows: Maximum allowable emission limits.

(1) For gaseous emissions, the 12 non-idle test point results and the four-point linear interpolation procedure specified in paragraph (g) of this section for intermediate conditions, shall define Maximum Allowable Emission Limits for purposes of paragraph B.1 of this section except as modified under paragraph (f)(3) of this section. [No change to remainder of paragraph.]

**Figure 1**




(2) If the weighted average emissions, calculated according to paragraph (e)(6) of this section, for any gaseous pollutant is equal to or lower than required by paragraph B.1 of this section, each of the 13 test values for that pollutant shall first be multiplied by the ratio of the applicable emission standard (under paragraph B.1 of this section) to the weighted average emissions value, and then by 1.10 for interpolation allowance, before determining the Maximum Allowable Emission Limits under paragraph (g)(2) of this section.

(3) [No change.]

8. Subparagraph (g) Calculating intermediate test points. [No change.]

**B. California provisions**

1. **Emission testing caps and procedures for the 2005 and 2006 model years**.

1.1 Testing to determine whether an engine meets the applicable emission limits when measured over the supplemental emission test is performed according to section 86.1363-2007. The weighted average exhaust emissions, as determined according to 86.1363-2007(g), for each regulated pollutant shall not exceed 1.0 times the applicable emission standards specified in Part I.11 of these test procedures or FELs specified in §86.007-11(a)(1).

1.2 For engines not having a NOx FEL less than 1.5 g/bhp-hr, gaseous exhaust emissions shall not exceed the steady-state interpolated values determined by the Maximum Allowable Emission Limits (for the corresponding speed and load), as determined under subparagraph (g) of this section, when the engine is operated in the steady-state control area defined under subparagraph (d) of this section, during steady-state engine operation.

1.3 For engines with a NOx FEL less than 1.5 g/bhp-hr, the Maximum Allowable Emission Limit requirements, as determined under Sec. 86.1360-2007(f), do not apply.

1.4 The emission caps specified in this section shall be rounded to the same number of significant figures as the applicable standards in Part I.11 of these test procedures using ASTM E29-93a.

2. **In-Use Compliance for 2005 and subsequent model year engines.** The procedures for in-use voluntary and influenced recall for heavy-duty diesel engines under this section are described in title 13, CCR §§2111 through 2140, except as modified by this paragraph for 2005 and 2006 model year engines. In evaluating the scope of the affected population for the purposes of this section, there shall be a rebuttable presumption that the affected population is the engine family to which the tested engines belong. No engine may be used to establish the existence of an emissions exceedance if the engine or vehicle in which it was installed was subject to abuse or improper maintenance or operation, or if the engine was improperly installed, and such acts or omissions caused the exceedance.

2.1 For the purposes of this section, an exceedance of the emission testing caps occurs when the average emissions of the test vehicles or engines, pursuant to title 13, CCR §2139, for any pollutant exceed the emission threshold. For the purposes of this section, emission threshold is defined as:

(i) for a test using vehicle test equipment (e.g., an over-the-road mobile monitoring device such as “ROVER”, or a chassis dynamometer), the applicable maximum NOx emissions limit plus the greater of 0.5 g/bhp-hr or one standard deviation of the data set established pursuant to paragraph B.2.2 of this section; or

(ii) for a test using an engine dynamometer, the applicable maximum NOx emissions limit plus 0.5 g/bhp-hr.

2.2 Where an engine dynamometer or vehicle test shows an apparent exceedance of the emissions threshold, the party conducting the original test shall repeat such test under the same conditions at least nine times. The mean of the tests shall be used for the averaging of the test vehicle emissions in determining compliance.

2.3 If the average emissions of the test vehicles exceed the emissions threshold, the Executive Officer shall notify the manufacturer in writing of the test results. The manufacturer has the option to submit an influenced recall plan in accordance with title 13, CCR §§ 2113 through 2121 within 45 days or to proceed with performing the engineering analysis and/or conducting further

testing in accordance with paragraphs B.2.4 and/or B.2.5 of this section. Upon the completion of testing conducted in paragraph(s) B.2.4 and/or B.2.5 if the test results indicate that the average emissions of the test vehicles exceeds the emissions threshold, the Executive Officer shall notify the manufacturer in writing of the test results and upon receipt of the notification, the manufacturer shall have 45 days to submit an influenced recall plan in accordance with title 13, CCR §§ 2113 through 2121.

2.4 If the testing conducted under paragraph B.2.1 and title 13, CCR § 2139 was performed using vehicle test equipment, then the engine manufacturer may elect to conduct additional tests of that engine using an engine dynamometer, provided that all environmental and engine operating conditions present during vehicle testing under paragraph B.2.1 and title 13, CCR § 2139 can be reproduced or corrected consistent with paragraph B.2.6 of this section. If the engine manufacturer elects to conduct such additional engine dynamometer tests, it shall provide ARB with at least three business days notice prior to commencement of such testing. If based on such additional tests the engine exceeds the emission threshold, the engine manufacturer may conduct further testing in accordance with paragraph B.2.5 of this section and/or perform an engineering analysis to determine the percentage of the affected population that exceeds the emissions threshold and the emission levels of the exceeding engines. However, the manufacturer may not determine the percentage of the affected population or the emission levels solely on the basis of an engineering analysis unless it demonstrates to the Executive Officer's satisfaction that such analysis alone is sufficient under the circumstances.

2.5 Within 60 days of receiving notice of an exceedance under paragraph B.2.3 of this section, the manufacturer may commence testing of not less than ten additional in-service engines. The manufacturer may conduct these tests using vehicle testing equipment, or using an engine dynamometer, at the manufacturer's option.

2.6 The testing of additional engines under paragraphs B.2.4 and B.2.5 of this section shall be conducted under conditions that are no less stringent than the initial test in terms of those parameters that may affect the result, and, at the manufacturer's option, may be limited to those emission limits and conditions for which apparent exceedances have been identified. Such parameters typically, but not necessarily, include relevant ambient conditions, operating conditions, service history, and age of the vehicle. Prior to conducting any testing, the manufacturer shall submit a test plan to ARB for its review and approval. Within 30 days following ARB's proposed modifications, the manufacturer shall incorporate the proposed modifications and implement the test plan as approved. Special conditioning of test engines shall not be permitted. Where the manufacturer elects to conduct the additional testing utilizing an engine dynamometer, it shall reproduce relevant engine operating and environmental conditions associated with the initial exceedance, provided, however, that correction factors may be used to reproduce temperature, humidity or altitude

conditions that cannot be simulated in the laboratory. Regardless of the testing equipment utilized, the test results shall be adjusted to reflect documented test systems error and/or variability in accordance with good engineering practices.

3. **Exemptions**.

3.1 The requirements set forth in this section do not apply to "ultra-small volume manufacturers" for model years 2005 and 2006. For the purposes of this section, an "ultra-small volume manufacturer" means any manufacturer with California sales less than or equal to 300 new passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles, and heavy-duty engines per model year based on the average number of vehicles and engines sold by the manufacturer in the previous three consecutive model years.

3.2 The requirements set forth in this section do not apply to "urban buses", as defined in title 13, CCR §1956.2, for model years 2005 and 2006.

4. **Determination of NOx Idling Emissions.** The requirements set forth in this subparagraph apply to 2008 and subsequent model year heavy-duty diesel engines certifying to the optional NOx idling emission standard specified in subsection 11.B.6.3, above. To determine whether an engine meets the optional NOx idling emission standard, emissions shall be measured by testing the engine on an engine dynamometer as described below.

4.1 **Test Cycle**. The following 2 mode duty cycle shall be performed on a dynamometer on the test engine:

| Mode | Engine Speed (rpm) | Time in mode (seconds) | Engine Load |
|---|---|---|---|
| 1 | Manufacturer Recommended Curb idle | 1800 | See subparagraph 4.1.1 below |
| 2 | 1100 | 1800 | See subparagraph 4.1.2 below |

4.1.1 For mode 1, the dynamometer load or torque applied shall be based on the vehicle power requirements during curb idle operation. The engine manufacturer shall determine the curb idle speed and the appropriate test load for the test engine. The load shall include curb idle power requirements needed for operating engine accessories, such as the engine cooling fan, alternator, coolant pump, air compressor, engine oil and fuel pumps and any other engine accessory operated during curb idle of the engine. The load for mode 1 may not include power requirements for operating the air conditioning compressor or for operating on-board

accessories, such as a microwave, refrigerator, television, computer, etc., that the vehicle operator may use during rest periods.

4.1.2 For mode 2, the dynamometer load or torque applied shall be based on the vehicle power requirements during idle speed operations of 1100 revolutions per minute (rpm). The engine manufacturer shall determine the appropriate test load for the test engine. The load shall include high engine idle speed power requirements needed for operating engine accessories, such as the engine cooling fan, alternator, coolant pump, air compressor, engine oil and fuel pumps, air conditioning compressor set at maximum capacity, and any other engine accessory operated during the idle operation of the engine. The total test load shall be equal to the test load so determined plus an additional load of 2 kilowatts to take into account the power needs for operating on-board accessories such as a television, refrigerator, microwave, computer, etc.

4.2 **Test Requirements.**

4.2.1 **Pre-conditioning**. Prior to measuring emissions, bring the engine to a warm condition as follows:

(a) If the idling test follows directly after testing over the Federal Test Procedure or the supplemental emission tests, consider the engine warm. Bring down the engine to the manufacturer recommended curb idle speed, apply the appropriate load as determined in subparagraph 4.1.1, and start measuring emissions after 10 minutes and only after achieving temperature stability. Temperature stability may be determined as the point at which the engine coolant temperature is within 2% of its mean value for at least 2 minutes.

(b) If the engine is cold, warm-up the engine by operating it at any speed above peak-torque speed and between 65 to 85% of maximum mapped power until the engine coolant's temperature is within 2% of its mean value for at least 2 minutes or until the engine thermostat controls engine temperature.

4.2.2 **Test Sequence**. Following engine warm-up as described in subparagraph 4.2.1, the test shall be performed first for mode 1. Bring down the engine to the curb idle speed, apply the appropriate load as determined in subparagraph 4.1.1, and start measuring emissions after 10 minutes and only after achieving temperature stability. Temperature stability may be determined as the point at which the engine coolant temperature is within 2% of its mean value for at least 2 minutes. Upon completion of mode 1 testing, the engine speed shall be ramped up to 1100 rpm. Once the engine starts operating at 1100 rpm, apply the appropriate load as determined in subparagraph 4.1.2, and start measuring emissions after 10 minutes and only after achieving temperature stability. Temperature stability may be determined as the point at which the engine coolant temperature is within 2% of its mean value for at least 2 minutes. The engine shall be operated for the prescribed time in each mode. The specified test speed shall be held to

within ±50 rpm and the specified torque shall be held to within ±2 percent of the maximum torque at the test speed.

4.2.3 **Calculations.** For each test mode, calculate the modal average mass emissions level for each regulated pollutant, in grams per hour, the modal average power, in brake horsepower and the modal average speed, in rpm. For compliance, the calculated average NOx emissions of each mode shall not exceed the optional NOx idling emission standard of 30 grams per hour specified in subsection 11.B.6.3 above.

86.1362 Steady-state testing with a ramped-modal cycle. October 25, 2016.

86.1363-2007 Steady-state testing with a discrete-mode cycle. June 30, 2008. (Deleted on April 28, 2014, by U.S. EPA, but this section remains unchanged in these test procedure since they were applicable to 2004 through 2009 model year heavy-duty engines.)

86.1370 Not-To-Exceed test procedures. October 25, 2016.

**A. Federal provisions.**

1. Amend subparagraph (a) as follows: General. The purpose of this test procedure is to measure in-use emissions of 2005 and subsequent model year heavy-duty diesel engines while operating within a broad range of speed and load points (the Not-To-Exceed Control Area) and under conditions which can reasonably be expected to be encountered in normal vehicle operation and use. Emission results from this test procedure are to be compared to the Not-To-Exceed Limits specified in paragraph (d)(1) of this section. The Not-To-Exceed Limits specified in paragraph (d)(1) of this section do not apply for engine starting conditions. Tests conducted using the procedures specified in this subpart are considered valid Not-to-Exceed tests (Note: duty cycles and limits on ambient conditions do not apply for Not-To-Exceed tests).

2. Amend subparagraph (b) as follows:

2.1 Introductory paragraph, subparagraphs (b)(1) through (b)(4): [No change.]

2.2 Amend subparagraph (b)(5) as follows: For particulate matter only from 2005 and 2006 model year engines, speed and load points determined by one of the following methods, whichever is applicable, shall be excluded from the Not-To-Exceed Control Area. B and C engine speeds shall be determined according to the provisions of § 86.1360-2007(c): [No change to remainder of paragraph.]

2.3 Amend subparagraphs (b)(6) and (b)(7) as follows: [No change except that these requirements apply for 2007 and subsequent model year engines.]

3. Subparagraph (c) [No change.]

4. Amend subparagraph (d) as follows: Not-to-exceed control area caps.

4.1 Amend subparagraph (d)(1) as follows: Add the following introductory sentence to subparagraph (d)(1): When operated within the Not-To-Exceed Control Area defined in paragraph (b) of this section, diesel engine emissions shall not exceed the applicable Not-To-Exceed Limits specified below when averaged over any time period greater than or equal to 30 seconds, except where a longer minimum averaging period is required by paragraph (d)(2) of this section.

(i)The emission caps specified in this section shall be rounded to the same number of significant figures as the applicable standards in Part I.11 of these test procedures using ASTM E29-93a.

(ii) For 2005 and 2006 model year engines, when operated within the Not-To-Exceed Control Area defined in paragraph (b) of this section, diesel engine brake-specific exhaust emissions in grams/bhp-hr (as determined under paragraphs (b) and (c) of this section), for each regulated pollutant, shall not exceed 1.25 times the applicable emission standards specified in Part I.11 of these test procedures during engine and vehicle operation specified in paragraph (e)(1) of this section, except as noted in paragraph (e)(2) of this section, when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

(iii) For 2007 and subsequent model year engines having a NOx FEL less than 1.50 g/bhp-hr, the brake-specific exhaust NMHC or NOx emissions in g/bhp-hr, as determined under Sec. 86.1370-2007 pertaining to the NTE test procedures, shall not exceed 1.5 times the applicable NMHC or NOx emission standards or FELs specified in Part I.11 of these test procedures, during engine and vehicle operation specified in subdivisions (b), (e), (f), and B.1 of this section when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

(iv) For 2007 and subsequent model year engines not having a NOx FEL less than 1.50 g/bhp-hr, the brake-specific NOx and NMHC exhaust emissions in g/bhp-hr, as determined under Sec. 86.1370-2007 pertaining to the not-to-exceed test procedures, shall not exceed 1.25 times the applicable emission standards or FELs specified in Part I.11 of these test procedures during engine and vehicle operation specified in paragraphs (b), (e), (f), and (g) of this section when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

(v) For 2007 and subsequent model year engines, the brake-specific exhaust PM emissions in g/bhp-hr, as determined under Sec. 86.1370-2007 pertaining to the not-to-exceed test procedures, shall not exceed 1.5 times the applicable PM emission standards or FEL (for FELs above the standard

only) specified in Part I.11 of these test procedures, during engine and vehicle operation specified in paragraphs (b), (e), (f), and B.1 of this section when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

4.2 Subparagraph (d)(2) [No change.]

4.3 Add the following subparagraph (d)(3): For 2005 and subsequent model year heavy-duty engines, operation within the Not-to-Exceed control area (defined in paragraph (b) of this section) must also comply with the following:

(i) A filter smoke number of 1.0 under steady-state operation, or the following alternate opacity limits:

(A) A 30 second transient test average opacity limit of 4% for a 5 inch path; and

(B) A 10 second steady state test average opacity limit of 4% for a 5 inch path.

(ii) The limits set forth in paragraph (d)(3)(i) of this section refer to exhaust smoke emissions generated under the conditions set forth in paragraphs (b) and (e) of this section and calculated in accordance with the procedures set forth in §86.1372-2007.

5. Amend subparagraph (e) as follows: Ambient corrections.

5.1 Introductory paragraph: [No change.]

5.2 Subparagraph (e)(1) For engines operating within the ambient conditions specified in paragraph B.1.1 of this section. [No change to remainder of paragraph.]

5.3 Amend subparagraph (e)(2) as follows: For engines operating within the ambient conditions specified in paragraph B.1.2 of this section; [No change to remainder of section.]

6. Amend subparagraph (f) as follows: NTE cold temperature operating exclusion. 2007 and subsequent model year engines equipped with exhaust gas recirculation (EGR) whose operation within the NTE control area specified in §86.1370(b) when operating during cold temperature conditions as specified in paragraph (f)(1) of this section are not subject to the NTE emission limits during the specified cold temperature operation conditions. [No change to remainder of section.]

7. Subparagraph (g) through (j). [No change.]

**B. California provisions.**

1. Ambient operating regions. For each engine family, the not-to-exceed emission limits must apply during one of the following two ambient operating regions;

1.1 The not-to-exceed emission limits apply for all altitudes less than or

equal to 5,500 feet above sea-level, during all ambient conditions (temperature and humidity). Temperature and humidity ranges for which correction factors are allowed are specified in paragraph (e) of this section; or

1.2 The not-to-exceed emission limits apply at all altitudes less than or equal to 5,500 feet above sea-level, for temperatures less than or equal to the temperature determined by the following equation at the specified altitude;

$$T = -0.00254 \times A + 100$$

Where:

T = ambient air temperature in degrees Fahrenheit

A = altitude in feet above sea-level (A is negative for altitudes below sea-level)

Temperature and humidity ranges for which correction factors are allowed are specified in section (e).

2. In-Use Compliance. The procedures for in-use voluntary and influenced recall for heavy-duty diesel engines under this section are described in title 13, CCR §§ 2111 through 2140, except as modified by this paragraph for 2005 and 2006 model year engines. In evaluating the scope of the affected population for the purposes of this section, there shall be a rebuttable presumption that the affected population is the engine family to which the tested engines belong. No engine may be used to establish the existence of an emissions exceedance if the engine or vehicle in which it was installed was subject to abuse or improper maintenance or operation, or if the engine was improperly installed, and such acts or omissions caused the exceedance.

2.1 For the purposes of this section, an exceedance of the emission testing caps occurs when the average emissions of the test vehicles or engines, pursuant to title 13, CCR § 2139, for any pollutant exceed the emission threshold. For the purposes of this section, emission threshold is defined as:

(i) for a test using vehicle test equipment (e.g., an over-the-road mobile monitoring device such as “ROVER”, or a chassis dynamometer), the applicable maximum NOx emissions limit plus the greater of 0.5 g/bhp-hr or one standard deviation of the data set established pursuant to paragraph B.2(2) of this section; or

(ii) for a test using an engine dynamometer, the applicable maximum NOx emissions limit plus 0.5 g/bph-hr.

2.2 Where an engine dynamometer or vehicle test shows an apparent exceedance of the emissions threshold, the party conducting the original test shall repeat such test under the same conditions at least nine times. The mean of the tests shall be used for the averaging of the test vehicle emissions in determining compliance.

2.3 If the average emissions of the test vehicles exceed the emissions threshold, the Executive Officer shall notify the manufacturer in writing of the test results. The manufacturer has the option to submit an influenced recall plan in accordance with title 13, CCR §§ 2113 through 2121 within 45 days or to

proceed with performing the engineering analysis and/or conducting further testing in accordance with paragraphs B.2.4 and/or B.2.5 of this section. Upon the completion of testing conducted in paragraph(s) B.2.2 and/or B.2.5, if the test results indicate that the average emissions of the test vehicles exceeds the emissions threshold, the Executive Officer shall notify the manufacturer in writing of the test results and upon receipt of the notification, the manufacturer shall have 45 days to submit an influenced recall plan in accordance with title 13, CCR §§ 2113 through 2121.

2.4 If the testing conducted under paragraph B.2.1 and title 13, CCR § 2139 was performed using vehicle test equipment, then the engine manufacturer may elect to conduct additional tests of that engine using an engine dynamometer, provided that all environmental and engine operating conditions present during vehicle testing under paragraph B.2.1 and title 13, CCR § 2139 can be reproduced or corrected consistent with paragraph B.2.6 of this section. If the engine manufacturer elects to conduct such additional engine dynamometer tests, it shall provide ARB with at least three business days notice prior to commencement of such testing. If based on such additional tests the engine exceeds the emission threshold, the engine manufacturer may conduct further testing in accordance with paragraph B.2.5 of this section and/or perform an engineering analysis to determine the percentage of the affected population that exceeds the emissions threshold and the emission levels of the exceeding engines. However, the manufacturer may not determine the percentage of the affected population or the emission levels solely on the basis of an engineering analysis unless it demonstrates to the Executive Officer's satisfaction that such analysis alone is sufficient under the circumstances.

2.5 Within 60 days of receiving notice of an exceedance under paragraph B.2.3 of this section, the manufacturer may commence testing of not less than ten additional in-service engines. The manufacturer may conduct these tests using vehicle testing equipment, or using an engine dynamometer, at the manufacturer's option.

2.6 The testing of additional engines under paragraphs B.2.4 and B.2.5 of this section shall be conducted under conditions that are no less stringent than the initial test in terms of those parameters that may affect the result, and, at the manufacturer's option, may be limited to those emission limits and conditions for which apparent exceedances have been identified. Such parameters typically, but not necessarily, include relevant ambient conditions, operating conditions, service history, and age of the vehicle. Prior to conducting any testing, the manufacturer shall submit a test plan to ARB for its review and approval. Within 30 days following ARB's proposed modifications, if any, the manufacturer shall incorporate the proposed modifications and implement the test plan as approved. Special conditioning of test engines shall not be permitted. Where the manufacturer elects to conduct the additional testing utilizing an engine dynamometer, it shall reproduce relevant engine operating and environmental conditions associated with the initial exceedance, provided, however, that

correction factors may be used to reproduce temperature, humidity or altitude conditions that cannot be simulated in the laboratory. Regardless of the testing equipment utilized, the test results shall be adjusted to reflect documented test systems error and/or variability in accordance with good engineering practices.

3. Deficiencies for NTE requirements.

3.1 For model years 2005 through 2009, upon application by the manufacturer, the Executive Officer may accept a HDDE as compliant with the NTE requirements even though specific requirements are not fully met. Such compliances without meeting specific requirements, or deficiencies, will be granted only if compliance would be infeasible or unreasonable considering such factors as, but not limited to: technical feasibility of the given hardware and lead time and production cycles including phase-in or phase-out of engines or vehicle designs and programmed upgrades of computers. Deficiencies will be approved on a engine model and/or horsepower rating basis within an engine family, and each approval is applicable for a single model year. A manufacturer's application must include a description of the auxiliary emission control device(s) which will be used to maintain emissions to the lowest practical level, considering the deficiency being requested, if applicable. An application for a deficiency must be made during the certification process; no deficiency will be granted to retroactively cover engines already certified.

3.2 Unmet requirements should not be carried over from the previous model year except where unreasonable hardware or software modifications would be necessary to correct the deficiency, and the manufacturer has demonstrated an acceptable level of effort toward compliance as determined by the Executive Officer. The NTE deficiency should only be seen as an allowance for minor deviations from the NTE requirements. The NTE deficiency provisions allow a manufacturer to apply for relief from the NTE emission requirements under limited conditions. ARB expects that manufacturers should have the necessary functioning emission control hardware in place to comply with the NTE.

3.3 For model years 2010 through 2013, the Executive Officer may allow up to three deficiencies per engine family. The provisions of §86.007-11 (a)(4)(iv)(A) and §86.007-11 (B) apply for deficiencies allowed by §86.007-11 (a)(4)(iv)(C). In determining whether to allow the additional deficiencies, the Executive Officer may consider any relevant factors, including the factors identified in §86.007-11 (a)(4)(iv)(A). If additional deficiencies are approved, the Executive Officer may set any additional conditions that he/she determines to be appropriate.

4. Exemptions.

4.1 The requirements set forth in this section do not apply to "ultra-small volume manufacturers" for model years 2005 and 2006. For the purposes of this section, an "ultra-small volume manufacturer" means any manufacturer

with California sales less than or equal to 300 new passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles, and heavy-duty engines per model year based on the average number of vehicles and engines sold by the manufacturer in the previous three consecutive model years.

4.2 The requirements set forth in this section do not apply to “urban buses”, as defined in title 13, CCR, § 1956.2, for model years 2005 and 2006.

5. Submission of NTE deficiencies and limited testing region information. Manufacturers are not required to provide engine information exclusively related to in-use testing as part of initial certification. However, upon request from ARB, the manufacturers must provide the information which clearly identifies parameters defining all NTE deficiencies described under subparagraph B.3. of this section and parameters defining all NTE limited testing regions described under 86.1370-07(b)(6) and (7) that are requested. When requested, deficiencies and limited testing regions must be reported for all engine families and power ratings in English with sufficient detail for us to determine if a particular deficiency or limited testing region will be encountered in the emission test data from the portable emission-sampling equipment and field-testing procedures referenced in 86.1375. Such information is to be provided within 60 days of the request from ARB.

86.1372 Measuring smoke emissions within the NTE zone. April 28, 2014.

This section contains the measurement techniques to be used for determining compliance with the filter smoke limit or opacity limits in §86.1370-2007 (d)(3)(i). [No change to remainder of section.]

**Subpart S – General Compliance Provisions for Control of Air Pollution From New and In-Use Light-Duty Vehicles, Light-Duty Trucks, and Complete Otto-Cycle Heavy-Duty Vehicles.**

86.1863-07 Optional chassis certification for diesel vehicles. September 15, 2011.

1. Amend subparagraph (a) as follows: For the 2004 through 2014 model years, a manufacturer may optionally certify heavy-duty diesel vehicles weighing 14,000 pounds GVWR or less to the emission standards specified in title 13, CCR, §1961. Such vehicles must meet all applicable requirements of the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as incorporated by reference in title 13, CCR, §1961(d). For the 2015 through 2019 model years, a manufacturer may optionally certify heavy-duty diesel vehicles weighing 8,500 to 10,000 pounds GVWR or less to the emission standards specified in title 13, CCR, §1961 or §1961.2, as applicable. Such vehicles must meet all applicable requirements of the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated by reference in section 1961.2, title 13, CCR. For the 2015 and subsequent model years, a manufacturer may optionally certify heavy-duty diesel vehicles weighing 10,001 to 14,000 pounds GVWR or less to the emission standards specified in title 13, CCR, §1961.2. Such vehicles must meet all applicable requirements of the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated by reference in section 1961.2, title 13, CCR. For the 2020 and subsequent model years, heavy-duty diesel 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.

2. Amend subparagraph (b) as follows: Diesel vehicles optionally certified under this section are subject to the OBD requirements of title 13, CCR, §1968.2.

3. Subparagraphs (c) to (g). [No change.]

4. Subparagraphs (h) and (i). [No change.]

**Subpart T - Manufacturer-Run In-Use Testing Program for Heavy-Duty Diesel Engines.**

86.1901 What testing requirements apply to my engines that have gone into service? November 8, 2010.

86.1905 How does this program work? November 8, 2010.

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

2. Amend subparagraph (g) as follows: For any communication related to this subpart, contact the On-Road Heavy-Duty Diesel Section Manager, Mobile Source Control Division, Air Resources Board, 9528 Telstar Avenue, El Monte, CA 91731.

86.1908 How must I select and screen my in-use engines? June 14, 2005.

1. Amend subparagraph (a) as follows:

1.1 Subparagraph (a)(1) through (a)(8). [No change.]

1.2 Amend subparagraph (a)(9) as follows: The vehicles have not exceeded the applicable useful life, in miles or years as defined in title 13, CCR, section 2112; you may otherwise not exclude engines from testing based on their age or mileage.

1.3 Subparagraph (a)(10). [No change.]

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

86.1910 How must I prepare and test my in-use engines? October 25, 2016.

86.1912 How do I determine whether an engine meets the vehicle-pass criteria? October 25, 2016.

86.1915 What are the requirements for Phase 1 and Phase 2 testing? June 14, 2005.

86.1917 How does in-use testing under this subpart relate to the emission-related warranty in Section 207(a)(1) of the Clean Air Act? June 14, 2005.

1. Amend subparagraph (a) as follows: An exceedance of the NTE found through the in-use testing program under this subpart is not by itself sufficient to show a breach of warranty under title 13, CCR, section 2036. [No change to remainder of paragraph.]

2. Amend subparagraph (b) as follows: To the extent that in-use NTE testing does not reveal such a material deficiency at the time of sale in the design or manufacture of an engine compared with the certified engine, or a defect in the materials and workmanship of a component or part, test results showing an exceedance of the NTE by itself would not show a breach of warranty under title 13, CCR, section 2036.

86.1920 What in-use testing information must I report to ARB? October 25, 2016.

1. Amend subparagraph (a) as follows: Send us electronic reports using an approved information format to Chief, Emission Research and Regulatory

Development Branch, Mobile Source Control Division, Air Resources Board, 9528 Telstar Avenue, El Monte, California, 91731. If you want to use a different format, send us a written request with justification.

2. Subparagraphs (b) to (c). [No change.]

3. Amend subparagraph (d) as follows: Send us an electronic notification at inuse@arb.ca.gov describing any voluntary vehicle/engine emission evaluation test you intend to conduct … [No change to remainder of paragraph.]

4. Amend subparagraph (e) as follows: Send us an electronic notification at inuse@arb.ca.gov within 15 days after your initial review of the test data for a selected engine family indicates that three engines in Phase 1 testing have failed to comply with the vehicle-pass criteria. [No change to remainder of paragraph.]

5. Subparagraphs (f) and (g). [No change.]

86.1925 What records must I keep? June 14, 2005.
86.1930 What special provisions apply from 2005 through 2009? November 8, 2010.

**Appendix I to Part 86 - Urban Dynamometer Schedules.**

(f)(2) EPA Engine Dynamometer Schedule for Heavy-Duty Diesel Engines. December 10, 1984.

**Appendix I to Subpart T – Sample Graphical Summary of NTE Emission Results**

## 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? October 25, 2016.

1. Amend subparagraph (a) as follows: Except as specified in 40 CFR §1036.5, the provisions of this part apply for engines that will be installed in heavy-duty vehicles (including glider vehicles) above 14,000 pounds GVWR for propulsion. These provisions also apply for engines that will be installed in 2019 and earlier model year incomplete heavy-duty vehicles from 8,501 to 10,000 pounds GVWR and in incomplete heavy-duty vehicles from 10,001 to 14,000 pounds GVWR, unless the engine is installed in a vehicle that is covered by an Executive Order under 40 CFR part 86, subpart S.

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

3. Delete subparagraph (c).

4. Subparagraph (d). [No change.]

1036.2 Who is responsible for compliance? October 25, 2016.

1036.5 Which engines are excluded from this part's requirements? October 25, 2016.

1036.10 How is this part organized? October 25, 2016.

1036.15 Do any other regulation parts apply to me? October 25, 2016.

1036.30 Submission of information. October 25, 2016.

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. October 25, 2016.

1036.108 Greenhouse gas emission standards. October 25, 2016.

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 2020 model years, a manufacturer may elect to demonstrate compliance with this section, 40 CFR §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 40 CFR §1036.730.

2. Subparagraphs (a) through (a)(1)(i). [No change.]

3. Add the following language to subparagraph (a)(1)(ii): As an option, 2017 through 2027 model year heavy-duty diesel engines, except in all cases engines used in medium-duty vehicles, may be certified to the Optional Low-$CO_2$ Emission Standards. The $CO_2$ emissions from engines certified to the Optional Low-$CO_2$ Emission Standards may not exceed the following standards:

| **Optional Low-$CO_2$ Emission Standards for 2017 through 2027 Model Year Heavy-Duty Diesel Engines (grams per horsepower-hour or g/hp-hr)** | | | | |
|---|---|---|---|---|
| *Light heavy-duty – vocational* | *Medium heavy-duty – vocational* | *Heavy heavy-duty – vocational* | *Medium heavy-duty – tractor* | *Heavy heavy-duty – tractor* |
| 490 | 474 | 446 | 409 | 387 |

Engines certified to the Optional Low-$CO_2$ Emission Standards must also comply with the applicable $CH_4$ and $N_2O$ emission standards set forth in subparagraphs (a)(2) and (a)(3), respectively. In addition, engines certified to these Optional Low-$CO_2$ Emission Standards and participating in the Innovative Technology Regulation set forth in §§2208 and 2208.1 of title 13, CCR are not eligible to participate in the averaging, banking, and trading program, or to generate credits for certification.

4. Subparagraphs (a)(2) through (f). [No change.]

1036.115 Other requirements. October 25, 2016.

1036.130 Installation instructions for vehicle manufacturers. October 25, 2016.

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. October 25, 2016.

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 and engine cycle. October 25, 2016.

1036.150 Interim provisions. October 25, 2016.

1. Amend subparagraph (a) as follows: *Credit provisions for 2013 model year compliance*. The provisions of this paragraph (a) apply to 2013 model year heavy-duty diesel engines that have generated early credits with U.S. Environmental Protection Agency. For each 2013 model year heavy-duty diesel engine that is certified to the greenhouse gas standards of 40 CFR Part 1036, an equal amount of credit as given by the U.S. Environmental Protection Agency will be granted in the California ABT Program. The manufacturer must notify ARB of its intent to use this provision before submitting its application and must submit to ARB all data that the manufacturer 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.

2. Subparagraphs (a)(1) through (p). [No change.]

**Subpart C – Certifying Engine Families**

1036.205 What must I include in my application? October 25, 2016.

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

2. Amend subparagraph (i) as follows: Unconditionally certify that all the engines in the engine family are built as described and comply with the requirements of this part, other referenced parts of the CFR, and title 13, CCR, section 1956.8. Note that 40 CFR §1036.235 specifies which engines to test to show that engines in the entire family comply with the requirements of this part.

3. Subparagraphs (j) through (n). [No change.]

1036.210 Preliminary approval before certification. October 25, 2016.

1036.225 Amending my application for certification. October 25, 2016.

1036.230 Selecting engine families. October 25, 2016.

1036.235 Testing requirements for certification. October 25, 2016.

1036.241 Demonstrating compliance with greenhouse gas emission standards. October 25, 2016.

1036.250 Reporting and recordkeeping for certification. October 25, 2016.

1036.255 What decisions may ARB make regarding my certificate of conformity? October 25, 2016.

**Subpart D – Testing Production Engines**

1036.301 Measurements related to GEM inputs in a selective enforcement audit. October 25, 2016.

**Subpart E – In-use Testing**

1036.401 In-use testing. October 25, 2016.

**Subpart F – Test Procedures**

1036.501 How do I run a valid emission test? October 25, 2016.
1036.505 Ramped-modal testing procedures. October 25, 2016.
1036.510 Engine data and information for vehicle certification. October 25, 2016.
1036.525 Hybrid engines. October 25, 2016.
1036.530 Calculating greenhouse gas emission rates. October 25, 2016.
1036.535 Determining steady-state engine fuel maps and fuel consumption at idle. October 25, 2016.
1036.540 Determining cycle-average engine fuel maps. October 25, 2016.

**Subpart G – Special Compliance Provisions**

1036.601 What compliance provisions apply? October 25, 2016.

1. Subparagraphs (a) through (a)(2). [No change.]
2. Amend subparagraph (a)(3) as follows: The warranty-related prohibitions in title 13, CCR, sections 2035, 2036, 2037, 2039, 2040, 2041, and 2042, apply to manufacturers of new heavy-duty highway engines in addition to the prohibitions described in 40 CFR 1068.101(b)(6).
3. Subparagraphs (a)(4) through (d). [No change.]

1036.605 GHG exemption for engines used in specialty vehicles. October 25, 2016.

1036.610 Off-cycle technology credits and adjustments for reducing greenhouse gas emissions. October 25, 2016.

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.
3. Subparagraph (e). [No change.]

1036.615 Engines with Rankine cycle waste heat recovery and hybrid powertrains. October 25, 2016.
1036.620 Alternate $CO_2$ standards based on model year 2011 compression-ignition engines. October 25, 2016.
1036.625 In-use compliance with family emission limits (FELs). October 25, 2016.
1036.630 Certification of engine GHG emissions for powertrain testing. October 25, 2016.

**Subpart H – Averaging, Banking, and Trading for Certification**

1036.701 General provisions. October 25, 2016.

1. Add the following language to subparagraph (a): Engines certified to the Optional Low-$CO_2$ Emission Standards pursuant to 40 CFR §1036.108, as amended September 15, 2011, which is hereby incorporated herein, as modified by these test procedures, and participating in the Innovative Technology Regulation set forth in §§2208 and 2208.1 of title 13, CCR may not generate credits or participate in the averaging, banking, and trading provisions of this subpart.

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

1036.705 Generating and calculating emission credits. October 25, 2016.
1036.710 Averaging. October 25, 2016.
1036.715 Banking. October 25, 2016.
1036.720 Trading. October 25, 2016.
1036.725 What must I include in my application for certification? October 25, 2016.
1036.730 ABT reports. October 25, 2016.
1036.735 Recordkeeping. October 25, 2016.
1036.740 Restrictions for using emission credits. October 25, 2016.
1036.745 End-of-year $CO_2$ credit deficits. October 25, 2016.
1036.750 What can happen if I do not comply with the provisions of this subpart? October 25, 2016.
1036.755 Information provided to the Department of Transportation. [n/a]

**Subpart I – Definitions and Other Reference Information**

1036.801 Definitions. October 25, 2016.

**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 through 2020 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 engines 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 or assembles 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. June 30, 2017.

**A. Federal Provisions.** [No change.]

**B. California Provisions.**

ARB means Air Resources Board.

1036.810 Incorporation by reference. October 25, 2016.

1036.815 Confidential information. October 25, 2016.

**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. October 25, 2016.

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 60055.43.

1036.825 Reporting and recordkeeping requirements. October 25, 2016.

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

2. Delete subparagraph (e).

Appendix I to Part 1036 – Default Engine Fuel Maps for 40 CFR §1036.540

## 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 ARB 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. October 25, 2016.

1065.12 Approval of alternate procedures. April 28, 2014.

1065.15 Overview of procedures for laboratory and field testing. October 25, 2016.

1. Subparagraphs (a) through (a)(2)(ii). [No change.]

2. Delete subparagraph (a)(2)(iii).

3. Subparagraphs (a)(2)(iv) through (f). [No change.]

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. October 25, 2016.
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. October 25, 2016.
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. October 25, 2016.
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. October 25, 2016.
1065.225 Intake-air flow meter. October 25, 2016.
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.
1065.247 Diesel exhaust fluid flow rate. October 25, 2016.
1065.248 Gas divider. July 13, 2005.

CO and $CO_2$ Measurements

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

Hydrocarbon Measurements

1065.260 Flame ionization detector. October 25, 2016.

1. Subparagraphs (a) through (e). [No change.]
2. Delete subparagraph (f).
3. Subparagraph (g). [No change.]

1065.265 Nonmethane cutter. September 15, 2011.
1065.266 Fourier transform infrared analyzer. October 25, 2016

1. Amend subparagraph (a) as follows: Application. For engines that run only on natural gas, you may use a Fourier transform infrared (FTIR) analyzer to measure nonmethane hydrocarbon (NMHC) for continuous sampling. You may use an FTIR analyzer with any gaseous-fueled engine, including dual-fuel engines, to measure $CH_4$, for either batch or continuous sampling (for subtraction from THC).
2. Subparagraph (b). [No change.]
3. Amend subparagraph (c) as follows: Hydrocarbon species for NMHC additive determination. To determine NMHC, measure ethane in addition to those same hydrocarbon species. Determine NMHC as described in 40 CFR §1065.660(b)(4).
4. Amend subparagraph (d) as follows: NMHC $CH_4$ determination from subtraction of $CH_4$ from THC. Determine $CH_4$ as described in 40 CFR §1065.660(d)(2). Determine NMHC from subtraction of $CH_4$ from THC as described in 40 CFR §1065.660(b)(3). Determine $CH_4$ as described in 40 CFR §1065.660(d)(2).
5. Subparagraph (e). [No change.]

1065.267 Gas chromatograph with a flame ionization detector. October 25, 2016.
1065.269 Photoacoustic analyzer for ethanol and methanol. April 28, 2014.

NOx Measurements

1065.270 Chemiluminescent detector. April 28, 2014.
1065.272 Nondispersive ultraviolet analyzer. April 28, 2014.
1065.275 $N_2O$ measurement devices. October 25, 2016.

$O_2$ Measurements

1065.280 Paramagnetic and magnetopneumatic $O_2$ detection analyzers. April 28, 2014.

Air-to Fuel Ratio Measurements

1065.284 Zirconia ($ZrO_2$) 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. October 25, 2016.
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. October 25, 2016.
1065.341 CVS, PFD, and batch sampler verification (propane check). October 25, 2016.
1065.342 Sample dryer verification. April 30, 2010.
1065.345 Vacuum-side leak verification. October 25, 2016.

CO and $CO_2$ Measurements

1065.350 $H_2O$ interference verification for $CO_2$ NDIR analyzers. April 28, 2014.
1065.355 $H_2O$ and $CO_2$ interference verification for CO NDIR analyzers. April 28, 2014.

Hydrocarbon Measurements

1065.360 FID optimization and verification. October 25, 2016.
1. Subparagraphs (a) through (a)(2). [No change.]
2. Delete subparagraph (a)(3).
3. Subparagraphs (b) through (d). [No change.]
4. Delete subparagraph (f).

1065.362 Non-stoichiometric raw exhaust FID $O_2$ interference verification. April 28, 2014.
1065.365 Nonmethane cutter penetration fractions. October 25, 2016.
1065.366 Interference verification for FTIR analyzers. October 25, 2016
1. Amend subparagraph (a) as follows: Scope and frequency. If you measure $CH_4$ or NMHC using an FTIR analyzer, verify the amount of interference after initial

analyzer installation and after major maintenance.

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

3. Amend subparagraph (c) as follows: System requirements. An FTIR analyzer must have combined interference that is within ±2% of the flow-weighted mean concentration of $CH_4$ or NMHC expected at the standard, though we strongly recommend a lower interference that is within ±1%.

4. Subparagraph (d). [No change.]

1065.369 $H_2O$, CO, and $CO_2$ interference verification for photoacoustic alcohol analyzers. April 28, 2014.

NOx Measurements

1065.370 CLD $CO_2$ and $H_2O$ quench verification. October 25, 2016.
1065.372 NDUV analyzer HC and $H_2O$ interference verification. September 15, 2011.
1065.375 Interference verification for $N_2O$ analyzers. October 25, 2016.
1065.376 Chiller $NO_2$ penetration. April 28, 2014.
1065.378 $NO_2$-to-NO converter conversion verification. September 15, 2011.

PM Measurements

1065.390 PM balance verifications and weighing process verification. October 25, 2016.
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. October 25, 2016.
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 data 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. October 25, 2016.
1065.550 Gas analyzer range verification, and drift verification. April 28, 2014.
1065.590 PM sampling media (e.g., filters) preconditioning and tare weighing. October 25, 2016.
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. October 25, 2016.
1065.610 Duty cycle generation. October 25, 2016.
1065.630 Local acceleration of gravity. April 28, 2014.
1065.640 Flow meter calibration calculations. October 25, 2016.
1065.642 SSV, CFV, and PDP molar flow rate calculations. October 25, 2016.
1065.644 Vacuum-decay leak rate. April 28, 2014.
1065.645 Amount of water in an ideal gas. October 25, 2016.
1065.650 Emission calculations. October 25, 2016.

1. Subparagraphs (a) through (c)(5). [No change.]
2. Delete subparagraph (c)(6).
3. Subparagraphs (d) through (h). [No change.]

1065.655 Chemical balances of fuel, intake air, and exhaust. October 25, 2016.
1065.659 Removed water correction. April 28, 2014.
1065.660 THC, NMHC, and $CH_4$ determination. October 25, 2016.

1. Subparagraphs (a) through (a)(2). [No change.]
2. Delete subparagraph (a)(3).
3. Subparagraphs (a)(4) through (b). [No change.]
4. Delete subparagraph (c).
5. Subparagraph (d). [No change.]
6. Delete subparagraph (e).

1065.665 THCE and NMHCE determination. October 25, 2016.
1065.667 Dilution air background emission correction. October 25, 2016.
1065.670 NOx intake-air humidity and temperature corrections. September 15, 2011.
1065.672 Drift correction. April 30, 2010.
1065.675 CLD quench verification calculations. October 25, 2016.

1065.680 Adjusting emission levels to account for infrequently regenerating aftertreatment devices. October 25, 2016
1065.690 Buoyancy correction for PM sample media. October 25, 2016.
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. Subparagraph (c). [No change.]

4. Amend subparagraph (d) as follows: *Fuel specifications*.

4.1 Subparagraph (1). [No change.]

4.2 Subparagraph (2). The fuel parameters specified in this subpart depend on measurement procedures that are incorporated by reference

5. Subparagraph (e). [No change.]

6. Subparagraph (f). [No change.]

**B. California provisions.**

1. **Methanol Fuel.**

1.1 Exhaust emission test fuel. For diesel alcohol vehicles and hybrid electric vehicles which use diesel alcohol engines, methanol or ethanol fuel used for exhaust and evaporative emission testing shall meet the specifications set forth in title 13, CCR, section 2292.1 (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 40 CFR §1065.703 | 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 40 CFR §1065.703 | 1.0 ± 0.1 vol. percent |

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

1.3 The specification range of the fuels to be used under this section 1 shall be reported in accordance with §86.094-21.

1.4 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. **Mixtures Of Petroleum and Alcohol Fuels for Flexible Fuel Vehicles.**

2.1 **Exhaust emission test fuel for emission-data and durability-data vehicles**. For diesel alcohol vehicles and hybrid electric vehicles which use diesel alcohol engines, methanol or ethanol fuel used for exhaust emission testing shall meet the applicable specifications set forth in title 13, CCR, section 2292.2 (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) as modified by the following:

| Specification | Limit |
|---|---|
| **M-85 Fuel Methanol** | |
| Petroleum fuel meeting the specifications of 40 CFR §1065.703 | 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 40 CFR §1065.703 | 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 diesel alcohol vehicles and hybrid electric vehicles that use diesel alcohol engines, petroleum fuel shall meet the applicable specifications in §86.1313-98(a) or (b), as modified by these test procedures, and methanol or ethanol fuel shall meet the applicable specifications set forth in title 13, CCR, section 2292.2 (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 §§ 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 emission deterioration when developing its durability demonstration.

2.3 **Evaporative emission test fuel for emission-data and durability data vehicles.** For diesel alcohol vehicles and hybrid electric vehicles, which use diesel alcohol engines, a blend of methanol or ethanol fuel used for evaporative emission testing shall meet the applicable specifications set forth in title 13, CCR, section 2292.2 (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) and gasoline meeting the specifications of 86.1313-94 (a)(1), as modified by these test procedures, 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 The specification range of the fuels to be used in this section 2 shall be reported in accordance with §86.094-21.

2.5 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.

3. **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 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, NOx, 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," which are incorporated by reference in title 13, CCR, §2317, 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.

1. Subparagraph (a) [No change.]

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

(b)(1) Use the ultra low sulfur grade test fuel as specified in Table 1 of §1065.703.

(b)(2) Diesel test fuel having the specifications listed below in the table may be used in exhaust emission testing as an option to the specifications in Table 1 of §1065.703. If a manufacturer elects to use this option, the Executive Officer shall conduct exhaust emission testing with diesel fuel having the specifications listed below.

| Diesel Fuel Specification | Limit | Test Method[a] |
|---|---|---|
| Natural Cetane Number | 47-55 | D613-86 |
| Distillation Range, °F | | Title 13 CCR, §2282(g)(3) |
| IBP | 340-420 | |
| 10% point | 400-490 | |
| 50% point | 470-560 | |
| 90% point | 550-610 | |
| EP | 580-660 | |
| API Gravity, degrees | 33-39 | D287-82 |
| Total Sulfur, ppm | 7-15 | Title 13 CCR, §2282(g)(3) |
| Nitrogen Content, ppmw | 100-500 | Title 13 CCR, §2282(g)(3) |
| Total Aromatic Hydrocarbons, vol.% | 8-12 | Title 13 CCR, §2282(g)(3) |
| Polycyclic Aromatic Hydrocarbons, wt.% (max.) | 1.4 | Title 13 CCR, §2282(g)(3) |
| Flashpoint, °F (max) | 130 | D 93-80 |
| Viscosity @ 40°C, centistokes | 2.0-4.1 | D 445-83 |

[a] ASTM specifications unless otherwise noted. A reference to a subsection of title 13, CCR, §2282 means the test method identified in that subsection for the particular property. 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 of the specified method.

3. Subparagraph (c) [No change.]

1065.705 Residual and intermediate residual fuel. April 28, 2014. [No change.]
1065.710 Gasoline. February 19, 2015. [n/a]
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 title 13, CCR, section 2292.5 (Specifications for Compressed Natural Gas) as modified by the following:

| Specification | Limit |
|---|---|
| **Compressed Natural Gas Certification Test Fuel** | |
| 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 title 13, CCR, section 2292.5 (Specifications for Compressed Natural Gas).

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

2. Subparargraphs (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:

| Specification | Limit |
|---|---|
| **Liquefied Petroleum Gas Certification Test Fuel** | |
| 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. Subparagraph (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.

1065.735 Diesel exhaust fluid. October 25, 2016.
1065.740 Lubricants. July 13, 2005.
1065.745 Coolants. July 13, 2005.
1065.750 Analytical gases. October 25, 2016.
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. June 30, 2014.
1065.850 Calculations. April 28, 2014.

**Subpart J – Field Testing and Portable Emission Measurement Systems**

1065.901 Applicability. June 30, 2008.
1065.905 General provisions. April 28, 2014.
1065.910 PEMS auxiliary equipment for field testing. April 30, 2010.
1065.915 PEMS instruments. April 28, 2014.
1065.920 PEMS calibrations and verifications. April 28, 2014.
1065.925 PEMS preparation for field testing. September 15, 2011.
1065.930 Engine starting, restarting, and shutdown. July 13, 2005.
1065.935 Emission test sequence for field testing. June 30, 2008.
1065.940 Emission calculations. November 8, 2010.

**Subpart K – Definitions and Other Reference Information**

1065.1001 Definitions. October 25, 2016.

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.

2. Amend the definition of “Hydrocarbon” as follows: *Hydrocarbon (HC)* means THC, THCE, NMHC, NMOG, or NMHCE, as applicable. Hydrocarbon generally means the hydrocarbon group on which the emission standards are based for each type of fuel and engine.

3. Delete the definition of “Nonmethane nonethane hydrocarbon (NMNEHC).”

1065.1005 Symbols, abbreviations, acronyms, and units of measure. October 25, 2016.

**A. Federal Provisions.** [No change.]

**B. California Provisions.**

ARB means Air Resources Board.

1065.1010 Incorporation by reference. October 25, 2016.

**Subpart L – Methods for Unregulated and Special Pollutants**

1065.1101 Applicability. April 28, 2014.

Semi-Volatile Organic Compounds

1065.1103 General provisions for SVOC measurement. April 28, 2014.
1065.1105 Sampling system design. October 25, 2016.
1065.1107 Sample media and sample system preparation; sample system assembly. October 25, 2016.
1065.1109 Post-test sampler disassembly and sample extraction. October 25, 2016.
1065.1111 Sample analysis. April 28, 2014.

## PART 1068 – GENERAL COMPLIANCE PROVISIONS FOR HIGHWAY, STATIONARY, AND NONROAD PROGRAMS

### Subpart A – Applicability and Miscellaneous Provisions

1068.1 Does this part apply to me? October 25, 2016.

1. Subparagraph (a) to (a)(1). [No change.]
2. Amend (a)(2) as follows: This part 1068 applies to heavy-duty motor vehicles and motor vehicle engines used in such vehicles, that are subject to the emission standards in title 13, CCR, section 1956.8.
3. Delete subparagraphs (a)(3) through (d).

1068.20 May ARB enter my facilities for inspections? October 25, 2016.

1. Delete subparagraph (a) and replace with: We may inspect your testing, manufacturing processes, storage facilities (including port facilities for imported engines and equipment or other relevant facilities), or records, as authorized by the California Health and Safety Code (Division 25.5 and Part 5, Division 26), to enforce the provisions of this chapter. Inspectors will have authorizing credentials and will usually limit inspections to normal operating hours.
2. Subparagraph (b). [No change.]
3. Delete subparagraph (c) and replace with: Any ARB Enforcement Officer must be furnished by those in charge of a facility being inspected with such reasonable assistance as may be necessary to discharge any function listed in this paragraph. Each applicant for or recipient of certification is required to cause those in charge of a facility operated for its benefit to furnish such reasonable assistance without charge to the ARB irrespective of whether or not the applicant controls the facility.
4. Delete subparagraph (d) and replace with: The duty to admit or cause to be admitted any ARB Enforcement Officer applies whether or not the applicant owns or controls the facility in question and applies both to domestic and foreign engine and vehicle manufacturers and facilities. The ARB will not attempt to make any inspections that it has been informed that local law forbids. However, if local law makes it impossible to insure the accuracy of data generated at a facility, no informed judgment that an engine or vehicle is certifiable or is covered by an Executive Order can properly be based on the data. It is the responsibility of the engine manufacturer or vehicle manufacturer to locate its testing and manufacturing facilities in jurisdictions where this situation will not arise.

1068.30 Definitions. October 25, 2016.

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

Date of manufacture: Delete and replace with:

*Date of manufacture* means one of the following:

(1) For engines, the date on which the crankshaft is installed in an engine block, with the following exception:

(i) Manufacturers may assign a date of manufacture at a point in the assembly process later than the date otherwise specified under this definition. For example, a manufacturer may use the build date printed on the label or stamped on the engine as the date of manufacture.

Engine: Delete

**B. California Provisions.**

"Administrator" means the Executive Officer of the Air Resources Board, or a designee of the Executive Officer.

"Certificate of Conformity" means an Executive Order certifying engines 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.

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

"Standard-setting part" means the articles of the California Code of Regulations that define emission standards for a particular engine.

"United States" in reference to vehicle or engine sales or vehicle or engine introduced into commerce means the vehicle or engine sales or vehicle or engine introduced into commerce in California.

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

1068.35 Symbols, acronyms, and abbreviations. October 8, 2008.

**A. Federal Provisions.** [No change.]

**B. California Provisions.**

ARB means Air Resources Board.

1068.45 General labeling provisions. October 25, 2016.

## Subpart E – Selective Enforcement Auditing