

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: The proposed amendments to this document are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions compared to the test procedures as last amended October 21, 2014. Existing intervening text that is not amended is indicated by “\* \* \* \*”.

NOTE: This document is incorporated by reference in section 1956.8(~~db~~), 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.<sup>1</sup> 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,” ~~as last amended December 6, 2012~~ (incorporated by reference in section 1976, title 13, CCR);
2. Warranty requirements (sections 2035, et seq., title 13, CCR);
3. OBD II (section 1968, et seq., title 13, CCR, as applicable);
4. “California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels through 2014,” ~~as last amended March 22, 2012~~ (incorporated by reference in section 2317, title 13, CCR); and
5. “California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years,” ~~as adopted March 22, 2012~~ (incorporated by reference in (section 2317, title 13, CCR).

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<sup>1</sup> 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,” ~~as last amended December 6, 2012~~ (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,” ~~as last amended April 18, 2013~~ (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**

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**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 rReference materials. ~~September 15, 2014~~ February 19,  
2015.**

- ~~1 Delete subparagraph (a).~~
- ~~2 Amend subparagraph (b) as follows:~~
  - ~~2.1 Delete subparagraphs (b)(1) through (b)(5).~~
  - ~~2.2 Subparagraph (b)(6) [No change.]~~

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

- 1. General Applicability. [§86.xxx-1]
  - A. Federal Provisions.**
    - 1. **§86.001-1** October 6, 2000.

\* \* \* \*

1.4 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 §86.0928-14.

\* \* \* \*

2. **§86.005-1** October 6, 2000

\* \* \* \*

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 §86.0928-14.

\* \* \* \*

3. **§86.016-1** ~~September 15, 2011.~~ April 28, 2014

3.1 Subparagraph (a) *Applicability.* ~~[No change.]~~ 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) ~~Optional Applicability~~Relationship to subpart S of this part. [n/a; Otto-cycle]No change.]

3.3 Subparagraph (c) through (c)(1). [No change.] 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 Delete subparagraph (c)(2) and replace with the following: On-board diagnostic requirements according to the provisions of title 13, CCR, sections 1968.2 and 1968.5 or title 13, CCR, sections 1971.1 and 1971.5, as applicable.

3.5 Delete subparagraph (c)(3) and replace with the following: Evaporative emission standards according to the provisions of title 13, CCR, section 1976.

3.6 Delete subparagraph (c)(4) and replace with the following: Refueling emission standards according to the provisions of title 13, CCR, section 1978.

3.7 Subparagraph (d) ~~Non-petroleum fueled vehicles. [No change.]~~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.

3.8 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.

3.9 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.**

\* \* \* \*

4. Regulations concerning U.S. EPA hearings, U.S. EPA inspections, specific language on the Certificate of Conformity, non-conformance penalties, selective enforcement audit, 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," ~~adopted August 5, 1999, as last amended March 22, 2012,~~ 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.

\* \* \* \*

7. Maintenance of records; submittal of information; right of entry. [§86.000-7] ~~October 22, 1996~~April 28, 2014. [No change.]

\* \* \* \*

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.** ~~October 6, 2000~~April 28, 2014.

\* \* \* \*

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 §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 §86.001-1 (e), as modified in Section I.1.A, above.]

1. **§86.094-14** ~~January 3, 1996~~April 28, 2014. Amend as follows:

\* \* \* \*

17. On-board diagnostics for engines used in applications less than or equal to 14,000 pounds GVWR. [~~§86.099-17; §86.005-17; §86.007-17~~]; [Delete and 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 and 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.]

\* \* \* \*

20. Incomplete vehicles, classification. [§86.085-20] ~~January 12, 1983~~ April 28, 2014.  
[No change.]

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

**A. Federal provisions.**

1. **§86.004-21** ~~October 6, 2000~~ April 28, 2014. Amend as follows:

\* \* \* \*

2. **§86.007-21** ~~August 30, 2006~~ April 28, 2014. Amend as follows:

\* \* \* \*

**B. California provisions**

\* \* \* \*

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

\* \* \* \*

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 for 2004 2017 and Subsequent 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, section 1961.2(d), 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. [~~§86.001-22~~ April 6, 1994April 30, 2010. [No change.]

23. Required data. [§86.xxx-23]

**A. Federal provisions.**

1. **§86.098-23.** ~~April 30, 2010~~April 28, 2014.

\* \* \* \*

2. **§86.001-23.** ~~October 21, 1997~~April 28, 2014. [No change, except that the amendments indicated for §86.098-23 above still apply.]

3. **§86.007-23.** ~~June 17, 2013~~April 28, 2014. [No change, except that the amendments indicated for §86.098-23 above still apply.]

\* \* \* \*

25. Maintenance. [§86.xxx-25]

**A. Federal provisions.**

1. **§86.004-25.** ~~October 21, 1997~~August 8, 2014.

\* \* \* \*

26. Mileage and service accumulation; emission measurements. [§86.004-26] ~~July 13, 2005~~April 28, 2014.

\* \* \* \*

28. Compliance with emission standards. [§86.xxx-28] January 18, 2001.

**A. Federal provisions.**

1. **§86.004-28.** ~~August 30, 2006~~April 28, 2014. Amend as follows:

\* \* \* \*

29. Testing by the Administrator. [§86.091-29]. ~~March 24, 1993~~April 28, 2014. [No change.]

30. Certification. [§86.xxx-30]

**A. Federal provisions**

1. ~~§86.004-30~~. ~~October 6, 2000~~April 28, 2014. Amend as follows:

\* \* \* \*

2. ~~§86.007-30~~. ~~February 24, 2009~~April 28, 2014. Amend as follows:

\* \* \* \*

35. Labeling. [§86.xxx-35].

**A. Federal Provisions.**

\* \* \* \*

2. ~~§86.007-35~~. ~~August 30, 2006~~February 19, 2015.

2.1 Subparagraphs (a) through (i). [No change except that the amendments set forth in §86.001-35 apply.]

\* \* \* \*

37. Production vehicles and engines. [§86.085-37] ~~June 6, 1997~~April 28, 2014. [No change.]

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

**A. Federal provisions**

1. ~~§86.004-38~~ ~~June 27, 2003~~April 28, 2014.

\* \* \* \*

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

~~2. §86.007-38~~ ~~June 29, 2004~~.

~~2.1~~ Subparagraphs (a) through (h). [No change, except as amended in ~~§86.004-38~~, above.]

~~2.2~~ Amend subparagraph (i) as follows: 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 low sulfur diesel fuel (that is, diesel fuel meeting ARB specifications for highway diesel fuel, including a 15 ppm sulfur cap)."

~~32. §86.010-38~~ April 30, 2010April 28, 2014.

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

32.2 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.

32.3 Subparagraph (h). [No change.]

32.4 Amend subparagraph (i) as follows: Through model year 2013, For 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).”

32.5 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.

\* \* \* \*

**Subpart N - Emission Regulations for New Otto-Cycle and Diesel Heavy-Duty Engines; Gaseous and Particulate Exhaust Test Procedures for Heavy-duty Engines**

\* \* \* \*

~~86.1305-2004~~ Introduction; structure of subpart. ~~October 6, 2000.~~

~~86.1305-2010~~ Introduction; structure of subpart. ~~September 15, 2011~~August 8, 2014.

~~86.1306-96~~ Equipment required and specifications; overview. ~~September 21, 1994.~~

~~86.1306-2007~~ Equipment required and specifications; overview. ~~January 18, 2001.~~

~~86.1308-84~~ Dynamometer and engine equipment specifications. ~~December 10, 1987.~~

~~86.1309-90~~ Exhaust gas sampling system; Otto-cycle and non-petroleum fueled engines. ~~January 18, 2001.~~

~~Amend subparagraph (a)(3) as follows: For methanol-fueled engines, the sample lines for the methanol and formaldehyde samples are heated to 235° ± 15°F (113° ± 8°C).~~

- ~~86.1310-90 Exhaust gas sampling and analytical system; diesel engines. September 5, 1997.~~
- ~~86.1310-2007 Exhaust gas sampling and analytical system for gaseous emissions from heavy duty diesel fueled engines and particulate emissions from all engines. January 18, 2001 [No change.]~~
- ~~86.1311-94 Exhaust gas analytical system, CVS bag sample. October 21, 1997.~~
- ~~86.1312-88 Weighing chamber and microgram balance specifications. September 5, 1997.~~
- ~~86.1312-2007 Filter stabilization and microbalance workstation environmental conditions, microbalance specifications, and particulate matter filter handling and weighing procedures. January 18, 2001.~~
- ~~86.1313-94 Fuel specifications. September 5, 1997.~~

Amend as follows:

- ~~1. Subparagraph (a) Gasoline fuel [n/a]~~
- ~~2. Subparagraph (b) Petroleum diesel test fuel. [For guidance see §86.1313-98.]~~
3. Subparagraph (c) Methanol fuel. Amend ~~§94(c)~~ as follows:  
Delete subparagraphs (c)(1) and (c)(2); replace with:
  - 3.1 (1) **Exhaust 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                   |
|---|-------------------------|
| <b>M-100 Fuel Methanol</b>                                      |                         |
| Methanol  | 98.0 ± 0.5 vol. percent |
| <b>Ethanol</b>  | 1.0 vol. Percent (max.) |
| Petroleum fuel meeting the specifications of 40 CFR §86.1313-98 | 1.0 ± 0.1 vol. percent  |
| <b>E-100 Fuel Ethanol</b>                                       |                         |
| Ethanol   | 98.0 ± 0.5 vol. percent |

|   |                         |
|---|-------------------------|
| <b>Methanol</b>   | 1.0 vol. Percent (max.) |
| Petroleum fuel meeting the specifications of 40 CFR §86.1313-98 | 1.0 ± 0.1 vol. percent  |

3.2—(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).

3.3—(3) [No change.]

3.4—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.

4. Subparagraph (d) Mixtures of petroleum and methanol fuels for flexible fuel vehicles. Amend 86.1313-94(d) as follows: Delete subparagraphs (d)(1) and (d)(2); replace with:

4.1—(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:

| Specification  | Limit   |
|--|---|
| <b>M-85 Fuel Methanol</b>  |   |
| —Petroleum fuel meeting the specifications of 40 CFR §86.1313-98 | 13-16 vol. percent  |
| —Reid vapor pressure   | 8.0-8.5 psi, using common blending components from the gasoline stream. |
| <b>E-85 Fuel Ethanol</b>   |   |
| —Petroleum fuel meeting the specifications of 40 CFR             | 15-21 vol. percent  |

|                      |   |
|----------------------|---|
| §86.1313-98          |   |
| —Reid vapor pressure | 8.0-8.5 psi, using common blending components from the gasoline stream. |

4.2—(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 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 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 86.001-26 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.

4.3—(3) [No change.]

4.4—**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 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 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.

4.5—**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.

5. Subparagraph (e) Natural gas fuel. Amend ~~§86.1313-98(e)~~ as follows: Delete subparagraphs (e)(1), (e)(2) and (e)(3); Replace with:

5.1—(1) **Exhaust emission test fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use natural gas, fuel used for exhaust and evaporative emission testing shall meet the specifications listed in section

2292.5, title 13, CCR, (Specifications for Compressed Natural Gas) as modified by the following:

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

5.2—(2) **Mileage accumulation fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use natural gas, fuel used for service accumulation shall meet the specifications listed in section 2292.5, title 13, CCR, (Specifications for Compressed Natural Gas).

5.3—(3) Delete.

5.4—(4) [No change.]

6. Amend 86.1313-94(f) as follows: Delete subparagraphs (f)(1) and (f)(2); Replace with:

6.1 (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 section 2292.6, title 13, CCR, (Specifications for Liquefied Petroleum Gas) as modified by the following:

| Specification  | Limit                     |
|--|---------------------------|
| <b>Liquefied Petroleum Gas Certification Test Fuel</b> |                           |
| —Propane   | 93.5 ± 1.0 volume percent |
| —Propene   | 3.8 ± 0.5 volume percent  |
| —Butane and heavier components                         | 1.9 ± 0.3 volume percent  |

6.2—(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 section 2292.6, title 13, CCR, (Specifications for Liquefied Petroleum Gas).~~

~~6.3 (3) [No change.]~~

~~7. §86.1313-94(g) [No change.]~~

~~8. Add the following California only requirement: 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 paragraph \_\_\_\_\_ of this title 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, 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," as adopted September 17, 1993. 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, emissions during operation with the new clean fuel shall not increase compared to emissions during vehicle operation on gasoline.~~

~~(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.~~

86.1313-98 Fuel specifications. February 18, 2000.

1. Subparagraph (a) [n/a]

2. Amend subparagraph (b) Diesel test fuel as follows:

2.1 Subparagraph (b)(1) [No change.]

2.2 Add the following language to subparagraph (b)(2): For 2004 through 2005 model year medium-duty diesel-fueled engines, the petroleum fuel used in exhaust emissions testing may meet the specifications listed below, or substantially equivalent specifications approved by the Executive Officer, as an option to the specifications in Table N90-2. Where a manufacturer elects pursuant to this subparagraph to conduct exhaust emission testing using the specifications in Table N98-2, or the specifications listed below, the Executive Officer shall conduct exhaust emission testing with the diesel fuel meeting the specifications elected by the manufacturer. The manufacturer shall submit evidence to the Executive Officer demonstrating to the Executive Officer's satisfaction that the test fuel will be the predominant in-use fuel. Such evidence could include such things as copies of signed contracts from customers indicating the intent to purchase and use the test fuel as the primary fuel for use in the engines or other evidence acceptable to the Executive Officer.

| <u>Fuel Property</u>                           | <u>Limit</u> | <u>Test Method<sup>a</sup></u> |
|--|--------------|--------------------------------|
| 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, wt. %                            | 0.01-0.05    | 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                       |

<sup>a</sup> 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.

2.3—(3) Add the following language to subparagraph (b)(3): For 2004 and 2005 model year medium-duty diesel-fueled engines, diesel fuel representative of commercial diesel fuel which will be generally available through retail outlets shall be used in service accumulation.

3. Subparagraphs (c), (d) and (e). [For guidance see §86.1313-94, above.]

~~86.1313-04 Fuel specifications. January 18, 2001. [n/a]~~

~~86.1313-2007 Fuel specifications. January 18, 2001.~~

~~1. Subparagraph (a) [n/a]~~

~~2. Subparagraph (b) heading and (b)(1) [No change]~~

~~3. Reletter subparagraph §86.1313-2007(b)(2) as (b)(2)(A) and add the following:~~

~~(b)(2)(B) Diesel fuel having the specifications listed below may be used in exhaust emission testing as an option to the specifications in Table N07-2. If a manufacturer elects to use this option, the Executive Officer shall conduct exhaust emission testing with diesel fuel having the specifications listed below.~~

| <u>Fuel Property</u>                           | <u>Limit</u> | <u>Test Method<sup>a</sup></u> |
|--|--------------|--------------------------------|
| 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                       |

<sup>a</sup>—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.

~~4. Subparagraph (b)(3) [No change]~~

- ~~86.1314-94 Analytical gases. June 30, 1995.~~
- ~~86.1316-94 Calibration; frequency and overview. September 5, 1997.~~
- ~~86.1318-84 Engine dynamometer system calibrations. December 10, 1984.~~
- ~~86.1319-90 CVS calibration. January 18, 2001.~~
- ~~86.1320-90 Gas meter or flow instrumentation calibration; particulate, methanol, and formaldehyde measurement. April 11, 1989.~~
- ~~86.1321-94 Hydrocarbon analyzer calibration. July 13, 2005.~~
- ~~86.1322-84 Carbon monoxide analyzer calibration. September 5, 1997.~~
- ~~86.1323-84 Oxides of nitrogen analyzer calibration. September 5, 1997.~~
- ~~86.1323-2007 Oxides of nitrogen analyzer calibration. January 18, 2001.~~
- ~~86.1324-84 Carbon dioxide analyzer calibration. September 5, 1997.~~
- ~~86.1325-94 Methane analyzer calibration. September 5, 1997.~~
- ~~86.1326-90 Calibration of other equipment. April 11, 1989.~~
- ~~86.1327-98 Engine dynamometer test procedures; overview. September 5, 1997.~~
- ~~86.1330-90 Test sequence, general requirements. January 18, 2001.~~
- ~~86.1332-90 Engine mapping procedures. September 21, 1994.~~
- ~~86.1333-90 Transient test cycle generation. February 18, 2000.~~

~~86.1333-2010 Transient test cycle generation. June 30, 2008~~April 28, 2014.

- ~~86.1334-84 Pre-test engine and dynamometer preparation. January 18, 2001.~~
- ~~86.1335-90 Optional forced cool-down procedure. September 5, 1997.~~
- ~~86.1336-84 Engine starting and restarting. September 21, 1994.~~
- ~~86.1337-96 Engine dynamometer test run. September 5, 1997.~~
- ~~86.1337-2007 Engine dynamometer test run. January 18, 2001.~~
- ~~86.1338-84 Emission measurement accuracy. September 5, 1997.~~
- ~~86.1338-2007 Emission measurement accuracy. January 18, 2001.~~
- ~~86.1339-90 Particulate filter handling and weighing. January 18, 2001.~~
- ~~86.1340-94 Exhaust sample analysis. June 30, 1995.~~
- ~~86.1341-98 Test cycle validation criteria. September 5, 1997.~~
- ~~86.1342-94 Calculations; exhaust emissions. September 5, 1997.~~

~~\* \* \* \* \*~~

~~Amend subparagraph (d) Meaning of symbols as follows:~~

~~\* \* \* \* \*~~

~~Delete subparagraph (d)(1)(ii)(D) and replace with: If gaseous fuels are being used, 18.64 g/ft<sup>3</sup> for natural gas and 17.28 g/ft<sup>3</sup> for liquefied petroleum gas, assuming an average carbon to hydrogen ratio of 1:3.803 for natural gas and 1:2.656 for liquefied petroleum gas, at 68°F and 760 mm Hg pressure. The~~

~~Executive Officer may approve other density values deemed appropriate by a manufacturer when gaseous fuels are being used.~~

~~Amend subparagraph (d)(3)(v)(B) as follows:  $CO_e = [1 - (0.01 + 0.005HCR)CO_{2e} - 0.00323R]CO_{em}$  for methanol fuel, where HCR is hydrogen to carbon ratio as measured for the fuel used. For natural gas and liquefied petroleum gas, HCR is assumed to be 2.656 and 3.802, respectively.~~

~~Amend subparagraph (d)(8)(iii) as follows: For petroleum-fueled, gaseous-fueled, and methanol-fueled diesel engines:  $K_H = 1/[1 - 0.0026(H - 75)]$  (or for SI units,  $= 1/[1 - 0.0182(H - 10.71)]$ ).~~

~~86.1343-88 Calculations; particulate exhaust emissions (including diesel gaseous fuel, dual fuel and multi-fuel engines). September 5, 1997.~~

~~86.1344-94 Required information. October 21, 1997.~~

~~86.1360-2007 Supplemental emission test; test cycle and procedures. June 30, 2008  
April 28, 2014.~~

**A. Federal provisions**

\* \* \* \*

3. Amend subparagraph (b) as follows:

3.1 Amend subparagraph (b)(1) as follows: The ramped-modal procedures described in §86.1362-2007 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.

\* \* \* \*

**B. California provisions**

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

\* \* \* \*

~~86.1362-2007 Steady-state testing with a ramped-modal cycle. June 30, 2008  
April 28, 2014.~~

~~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.)~~

~~86.1370-2007 Not-To-Exceed test procedures. November 8, 2010  
April 28, 2014.~~

**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 ~~§1904~~ 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).

\* \* \* \*

8. Subparagraph (h). Emergency vehicle AECDs. [No change.]

\* \* \* \*

~~86.1372-2007~~ Measuring smoke emissions within the NTE zone. ~~October 6, 2000~~  
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.]

~~86.1375-2007~~ Equipment Specifications for Field Testing. ~~June 14, 2005.~~ [No change.]

~~86.1380-2004~~ Load response test. ~~October 6, 2000.~~ [Delete]

**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 amended ~~December 6, 2012,~~ 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,” ~~as amended December 6, 2012,~~ 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,” ~~as amended December 6, 2012,~~ 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.

\* \* \* \*

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

\* \* \* \*

**Subpart B – Emission Standards and Related Requirements**

\* \* \* \*

1036.115 Other requirements. ~~September 15, 2011~~April 28, 2014.

\* \* \* \*

**PART 1065 – ENGINE-TESTING PROCEDURES.**

**Subpart A – Applicability and General Provisions**

1065.1 Applicability. ~~September 15, 2011~~April 28, 2014.

\* \* \* \*

1065.2 Submitting information to EPA under this part. ~~April 30, 2010~~April 28, 2014.

\* \* \* \*

1065.10 Other procedures. ~~April 30, 2010~~February 19, 2015.

1065.12 Approval of alternate procedures. ~~June 30, 2008~~April 28, 2014.

1065.15 Overview of procedures for laboratory and field testing. ~~September 15, 2011~~April 28, 2014.

1065.20 Units of measure and overview of calculations. ~~September 15, 2011~~April 28, 2014.

1065.25 Recordkeeping. ~~July 13, 2005~~April 28, 2014.

### **Subpart B – Equipment Specifications**

\* \* \* \*

1065.130 Engine exhaust. ~~June 30, 2008~~April 28, 2014.

1065.140 Dilution for gaseous and PM constituents. ~~September 15, 2011~~April 28, 2014.

1065.145 Gaseous and PM probes, transfer lines, and sampling system components. ~~April 30, 2010~~April 28, 2014.

\* \* \* \*

1065.170 Batch sampling for gaseous and PM constituents. ~~September 15, 2011~~April 28, 2014.

\* \* \* \*

### **Subpart C – Measurement Instruments**

1065.201 Overview and general provisions. ~~April 30, 2010~~April 28, 2014.

1065.202 Data updating, recording, and control. ~~July 13, 2005~~April 28, 2014.

1065.205 Performance specifications for measurement instruments. ~~September 15, 2011~~April 28, 2014.

### **Measurement of Engine Parameters and Ambient Conditions**

1065.210 Work input and output sensors. ~~June 30, 2008~~April 28, 2014.

\* \* \* \*

## Flow-Related Measurements

\* \* \* \*

- 1065.225 Intake-air flow meter. ~~September 15, 2011~~ April 28, 2014.  
1065.230 Raw exhaust flow meter. ~~July 13, 2005~~ April 28, 2014.  
1065.240 Dilution air and diluted exhaust flow meters. ~~April 30, 2010~~ April 28, 2014.

\* \* \* \*

## CO and CO<sub>2</sub> Measurements

- 1065.250 Nondispersive infra-red analyzer. ~~September 15, 2011~~ April 28, 2014.

## Hydrocarbon Measurements

- 1065.260 Flame ionization detector. ~~September 15, 2011~~ April 28, 2014.

\* \* \* \*

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

## NO<sub>x</sub> Measurements

- 1065.270 Chemiluminescent detector. ~~September 15, 2011~~ April 28, 2014.  
1065.272 Nondispersive ultraviolet analyzer. ~~September 15, 2011~~ April 28, 2014.  
1065.275 N<sub>2</sub>O measurement devices. ~~June 17, 2013~~ April 28, 2014.

## O<sub>2</sub> Measurements

- 1065.280 Paramagnetic and magnetopneumatic O<sub>2</sub> detection analyzers.  
~~September 15, 2011~~ April 28, 2014.

## Air-to Fuel Ratio Measurements

- 1065.284 Zirconia (ZrO<sub>2</sub>) analyzer. ~~September 15, 2011~~ April 28, 2014.

PM Measurements

\* \* \* \*

1065.295 PM inertial balance for field-testing analysis. ~~September 15, 2011~~April 28, 2014.

**Subpart D – Calibrations and Verifications**

\* \* \* \*

1065.303 Summary of required calibration and verifications. ~~September 15, 2011~~April 28, 2014.

1065.305 Verifications for accuracy, repeatability, and noise. ~~April 30, 2010~~April 28, 2014.

1065.307 Linearity verification. ~~September 15, 2011~~April 28, 2014.

1065.308 Continuous gas analyzer system-response and updating-recording verification – for gas analyzers not continuously compensated for other gas species. ~~October 8, 2008~~April 28, 2014.

1065.309 Continuous gas analyzer ~~uniform~~ system-response and updating-recording verification – for gas analyzers continuously compensated for other gas species. ~~April 30, 2010~~April 28, 2014.

Measurement of Engine Parameters and Ambient Conditions

1065.310 Torque calibration. ~~June 30, 2008~~April 28, 2014.

1065.315 Pressure, temperature, and dewpoint calibration. ~~April 30, 2010~~April 28, 2014.

Flow-Related Measurements

\* \* \* \*

1065.341 CVS, PFD, and batch sampler verification (propane check). ~~September 15, 2011~~April 28, 2014.

\* \* \* \*

CO and CO<sub>2</sub> Measurements

1065.350 H<sub>2</sub>O interference verification for CO<sub>2</sub> NDIR analyzers. ~~September 15, 2011~~April 28, 2014.

1065.355 H<sub>2</sub>O and CO<sub>2</sub> interference verification for CO NDIR analyzers. ~~April 30, 2010~~April 28, 2014.

## Hydrocarbon Measurements

- 1065.360 FID optimization and verification. ~~September 15, 2011~~April 28, 2014.  
1065.362 Non-stoichiometric raw exhaust FID O2 interference verification. ~~June 30, 2008~~April 28, 2014.  
1065.365 Nonmethane cutter penetration fractions. ~~October 30, 2009~~April 28, 2014.  
1065.369 H<sub>2</sub>O, CO, and CO<sub>2</sub> interference verification for photoacoustic alcohol analyzers. April 28, 2014.

## NOx Measurements

- 1065.370 CLD CO<sub>2</sub> and H<sub>2</sub>O quench verification. ~~September 15, 2011~~April 28, 2014.  
1065.372 NDUV analyzer HC and H<sub>2</sub>O interference verification. September 15, 2011.  
1065.375 Interference verification for N<sub>2</sub>O analyzers. April 28, 2014.  
1065.376 Chiller NO<sub>2</sub> penetration. ~~June 30, 2008~~April 28, 2014.

\* \* \* \*

## Subpart E – Engine Selection, Preparation, and Maintenance

\* \* \* \*

- 1065.405 Test engine preparation and maintenance. ~~June 30, 2008~~April 28, 2014.  
1065.410 Maintenance limits for stabilized test engines. ~~June 30, 2008~~February 19, 2015.

\* \* \* \*

## Subpart F – Performing an Emission Test in the Laboratory

- 1065.501 Overview. ~~April 30, 2010~~April 28, 2014.  
1065.510 Engine mapping. ~~September 15, 2011~~April 28, 2014.  
1065.512 Duty cycle generation. ~~October 8, 2008~~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. ~~September 15, 2011~~April 28, 2014.  
1065.525 Engine starting, restarting, and shutdown. September 15, 2011.  
1065.526 Repeating void modes or test intervals. ~~November 8, 2010~~April 28, 2014.

- 1065.530 Emission test sequence. ~~September 15, 2011~~April 28, 2014.
- 1065.545 ~~Validation~~Verification of proportional flow control for batch sampling. ~~April 30, 2010~~April 28, 2014.
- 1065.546 ~~Validation~~Verification of minimum dilution ratio for PM batch sampling and drift correction. ~~September 15, 2011~~April 28, 2014.
- 1065.550 Gas analyzer range ~~validation~~verification, ~~and drift validation~~verification, and drift correction. ~~September 15, 2011~~April 28, 2014.
- 1065.590 PM sampling media (e.g., filters) preconditioning and tare weighing. June 30, 2008.

\* \* \* \*

**Subpart G – Calculations and Data Requirements**

- 1065.601 Overview. ~~April 30, 2010~~April 28, 2014.
- 1065.602 Statistics. ~~September 15, 2011~~April 28, 2014.
- 1065.610 Duty cycle generation. ~~June 17, 2013~~February 19, 2015.
- 1065.630 Local acceleration of 1980 international gravity formula. ~~July 13, 2005~~April 28, 2014.
- 1065.640 Flow meter calibration calculations. ~~September 15, 2011~~April 28, 2014.
- 1065.642 SSV, CFV, and PDP molar flow rate calculations. ~~September 15, 2011~~April 28, 2014.
- 1065.644 Vacuum-decay leak rate. April 28, 2014.
- 1065.645 Amount of water in an ideal gas. ~~September 15, 2011~~April 28, 2014.
- 1065.650 Emission calculations. ~~September 15, 2011~~February 19, 2015.
- 1065.655 Chemical balances of fuel, intake air, and exhaust. ~~September 15, 2011~~April 28, 2014.
- 1065.659 Removed water correction. ~~September 15, 2011~~April 28, 2014.
- 1065.660 THC, and NMHC, and CH<sub>4</sub> determination. September 15, 2011.
- 1065.665 THCE and NMHCE determination. ~~June 30, 2008~~April 28, 2014.

\* \* \* \*

- 1065.690 Buoyancy correction for PM sample media. ~~April 30, 2010~~April 28, 2014.
- 1065.695 Data requirements. ~~June 30, 2008~~April 28, 2014.

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

- 1065.701 General requirements for test fuels. ~~April 30, 2010~~April 28, 2014.

**A. Federal provisions.**

\* \* \* \*

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.

\* \* \* \*

**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                   |
|--|-------------------------|
| <b>M-100 Fuel Methanol</b>   |                         |
| Methanol   | 98.0 ± 0.5 vol. percent |
| Ethanol  | 1.0 vol. Percent (max.) |
| Petroleum fuel meeting the specifications of 40 CFR <del>§86.1313-98</del> <u>1065.703</u> | 1.0 ± 0.1 vol. percent  |
| <b>E-100 Fuel Ethanol</b>  |                         |
| Ethanol  | 98.0 ± 0.5 vol. percent |
| Methanol   | 1.0 vol. Percent (max.) |
| Petroleum fuel meeting the specifications of 40 CFR <del>§86.1313-98</del> <u>1065.703</u> | 1.0 ± 0.1 vol. percent  |

\* \* \* \*

**2. Mixtures Of Petroleum and Methanol 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   |
|--|---|
| <b>M-85 Fuel Methanol</b>  |   |
| Petroleum fuel meeting the specifications of 40 CFR <del>§86.1313-98</del> <u>1065.703</u> | 13-16 vol. percent  |
| Reid vapor pressure  | 8.0-8.5 psi, using common blending components from the gasoline stream. |
| <b>E-85 Fuel Ethanol</b>   |   |
| Petroleum fuel meeting the specifications of 40 CFR <del>§86.1313-98</del> <u>1065.703</u> | 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 §§ 86.0014-26 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.

\* \* \* \*

**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 ~~paragraph §86.1313-98~~ 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.

\* \* \* \*

1065.703 Distillate diesel fuel. ~~April 30, 2010~~April 28, 2014.

\* \* \* \*

1065.705 Residual and intermediate residual fuel. ~~June 30, 2008~~April 28, 2014.  
 [No change.]  
 1065.710 Gasoline. ~~June 30, 2008~~ February 19, 2015. [n/a]  
 1065.715 Natural gas. ~~June 30, 2008~~April 28, 2014.

\* \* \* \*

1065.720 Liquefied petroleum gas. ~~July 13, 2005~~April 28, 2014.

\* \* \* \*

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:

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

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.

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

|  |  |
|--|--|
|  | <u>blending components from the gasoline stream.</u> |
|--|--|

**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 ( $\pm 1.0$  volume percent of total blend) for methanol-fueled vehicles or 10 volume percent ethanol ( $\pm 1.0$  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.

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1065.750 Analytical gases. ~~September 15, 2011~~April 28, 2014.

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## Subpart I – Testing with Oxygenated Fuels

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- 1065.805 Sampling system. ~~June 30, 2008~~April 28, 2014.  
1065.845 Response factor determination. ~~April 30, 2010~~April 28, 2014.  
1065.850 Calculations. ~~July 13, 2005~~April 28, 2014.

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

\* \* \* \*

- 1065.905 General provisions. ~~November 8, 2010~~April 28, 2014.

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- 1065.915 PEMS instruments. ~~September 15, 2011~~April 28, 2014.  
1065.920 PEMS calibrations and verifications. ~~November 8, 2010~~April 28, 2014.

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## Subpart K – Definitions and Other Reference Information

- 1065.1001 Definitions. ~~September 15, 2011~~April 28, 2014.

\* \* \* \*

- 1065.1005 Symbols, abbreviations, acronyms, and units of measure. ~~September 15, 2011~~April 28, 2014.  
1065.1010 Reference materials Incorporation by reference. ~~September 15, 2011~~April 28, 2014.