APPENDIX G

State of California
AIR RESOURCES BOARD

PROPOSED

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

Adopted:	December 27, 2000
Amended:	December 12, 2002
Amended:	July 26, 2007
Amended:	October 17, 2007
Amended:	September 27, 2010
Amended:	March 22, 2012
Amended:	December 6, 2012
Amended:	April 18, 2013 (Corrected by Section 100)
Amended:	[Insert date of HD GHG Phase 1 amendment]
Amended:	[Insert date of amendment]

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 April 18, 2013. The document in which the amendments are being shown is a version that was initially approved by the Board on HD GHG Date, 201X for adoption as part of the "Rulemaking to Consider the Proposed Greenhouse Gas (GHG) Regulations for Medium- and Heavy-Duty Engines and Vehicles, Optional Reduced Emission Standards for Heavy-Duty Engines, and Amendments to the Tractor-Trailer GHG Regulation, Diesel-Fueled Commercial Motor Vehicle Idling Rule, and the Heavy-Duty Hybrid-Electric Vehicles Certification Procedures." That rulemaking is not yet final. Changes to this document as approved on HD GHG Date, 201X are indicated by dotted underline to indicate additions and ~~*italics double strikeout*~~ to indicate deletions compared to the April 18, 2013 version. The dotted underline and *italics double strikeout* text is presented for context and completeness only and is not subject to comment in this proposal. Existing intervening text that is not amended is indicated by "* * * *".

Date of Release: September 2, 2014; 45-day Notice Version
Date of Hearing: October 23, 2014

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

1. "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," ~~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).

[1] The requirements for Otto-cycle engines used in complete vehicles up to 14,000 pounds GVW are contained in the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," ~~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 OTTO-CYCLE ENGINES AND VEHICLES

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

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

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

1. **General Applicability.** [§86.xxx-1]

A. Federal provisions.

1. §86.001-1. October 6, 2000.

1.1 Subparagraph (a). [No change.]

1.2 Delete subparagraph (b) and replace with the following: A manufacturer must certify any complete heavy-duty vehicle of 14,000 pounds gross vehicle weight rating or less in accordance with the medium-duty vehicle provisions contained in the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures ~~for 2001 and Subsequent~~ and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated herein by reference. Heavy-duty engine or vehicle provisions of subpart A do not apply to such a vehicle.

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

seeks certification. For a manufacturer certifying for the first time in California, model-year production shall be based on projected California sales. The small volume manufacturer's heavy-duty engine certification procedures are described in 40 CFR §86.09~~2~~8-14.

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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 are fewer than 4,500 units based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model-year production shall be based on projected California sales. The small volume manufacturer's heavy-duty engine certification procedures are described in 40 CFR §86.09~~2~~8-14.

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

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 ~~Delete s~~Subparagraph (b). [No change.]~~ and replace with the following: A manufacturer must certify any complete heavy-duty vehicle of~~

14,000 pounds gross vehicle weight rating or less and any 2020 and subsequent model incomplete heavy-duty vehicle of 10,000 pounds gross vehicle weight rating or less in accordance with the medium-duty vehicle provisions contained in the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," as amended December 6, 2012, incorporated by reference in §1961(d), title 13, CCR or the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," as amended December 6, 2012, 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.

3.3 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.

3.47 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.

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

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

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

3.8 Subparagraph (h). [No change.]

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

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10. **Emission standards for Otto-cycle heavy-duty engines and vehicles.** [§86.xxx-10]

A. Federal provisions.

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3. **§86.005-10**. ~~December 8, 2005~~ April 28, 2014. Amend as follows:

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4. **§86.008-10**. ~~April 30, 2010~~ April 28, 2014. Amend as follows:

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14. **Small-volume manufacturers certification procedures.** [§86.xxx-14]. [Note: A small volume manufacturer shall mean a California small volume manufacturer as defined in Section I.1.A., above. Any reference to 10,000 units shall mean 4,500 units in California based on a three year running average as defined in I.1.A., above.]

1. §86.094-14. ~~April 30, 2010~~ April 28, 2014. Amend as follows:

* * * *

17. **Emission control diagnostic system for light-duty vehicles and trucks.** [~~§86.099-17;~~ ~~§86.005-17;~~ §86.007-17] Delete; replace with: All heavy-duty Otto-cycle engines up to 14,000 pounds GVW must have an on-board diagnostic system as required in section 1968, et seq., title 13, CCR, as applicable.

* * * *

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. [No change.]
2. §86.007-21. ~~August 30, 2006~~ April 28, 2014. [No change - diesel only.]

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22. **Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certifications and Selective Enforcement Audit, adequacy of limits, and physically adjustable ranges**. [§86.00194-22] ~~April 6, 1994~~ April 30, 2010. [No change.]

23. **Required data.** [§86.xxx-23]

A. Federal provisions.

1. §86.001-23. ~~October 21, 1997~~ April 28, 2014. [No change.]
2. §86.007-23. ~~*January 18, 2001.*~~ ~~June 17, 2013~~ April 28, 2014. [No change.]

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25. **Maintenance.** [§86.xxx-25]

1. §86.004-25. ~~October 17, 1997~~ April 28, 2014. [No change.]
2. §86.007-25. January 18, 2001. [No change.]

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

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28. **Compliance with emission standards.** [§86.xxx-28]

A. Federal provisions.

1. §86.004-28. ~~August 30, 2006~~ April 28, 2014. [No change.]

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

30. **Certification.** [§86.xxx-30].

1. §86.004-30. ~~October 6, 2000~~ April 28, 2014. [No change.]
2. §86.007-30. ~~February 24, 2009~~ April 28, 2014. [No change.]

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35. **Labeling.** [§86.xxx-35]

A. Federal provisions.

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2. §86.007-35. ~~August 30, 2006~~ April 28, 2014. [No change, except as noted above for §86.001-35.]

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

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

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

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

~~2. §86.007-38. June 29. 2004. [No change, except as noted above for §86.004-38 subparagraph (g)(1).]~~

~~3~~2. §86.010-38. ~~April 30, 2010~~ April 28, 2014. [No change, except as noted above for §86.004-38 subparagraph (g)(1).]

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Part II. OTHER REQUIREMENTS; TEST PROCEDURES

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

86.1301-90 Scope; applicability. ~~April 11, 1989~~ July 13, 2005.

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~~86.1305-2004 Introduction; structure of subpart. October 6, 2000.~~
86.1305-~~2010~~ Introduction; structure of subpart. ~~September 15, 2011~~ April 28, 2014.
~~86.1306-96 Equipment required and specification; overview. September 21, 1994.~~
~~86.1306-07 Equipment required and specification; overview. January 18, 2001.~~
~~86.1308-84 Dynamometer and engine equipment specifications. December 16, 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 235º ± 15ºF (113º ± 8ºC).~~

~~86.1311-94 Exhaust gas analytical system; CVS bag sample. October 21, 1997.~~
~~86.1313-94 Fuel specifications. September 5, 1997.~~
~~86.1313-98 Fuel specifications. February 18, 2000. [n/a diesel fuel specifications.]~~
~~86.1313-2004 Fuel specifications. January 18, 2001.~~
~~86.1313-2007 Fuel specifications. January 18, 2001 [n/a diesel fuel specifications.]~~

~~**A. Federal Provisions.**~~
~~Amend the federal fuel specifications as follows:~~
~~**1. California Certification Gasoline Specification.**~~
~~1.1 Certification Gasoline Fuel Specifications for the 2004 through 2019 Model Years.~~

~~Add the following subparagraph which reads: For 2004 through 2019 model engines certifying in accordance with these test procedures, gasoline having the~~

specifications listed below may be used in exhaust and evaporative emission testing as an option to the specifications referred to in 86.1313-94(a)(1) and in 86.1313-2004(a)(1). If a manufacturer elects to utilize this option, both exhaust and evaporative emission testing shall be conducted by the manufacturer with gasoline having the specifications listed below, and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications listed below. For the 2015 through 2019 model years, gasoline having the specifications listed in Part II, Section A.1.2 may be used in exhaust and evaporative emission testing as an option to the specifications referred to in §86.113-94(a)(1), §86.113-04(a)(1), and this section A.1.1. If a manufacturer elects to certify a 2015 through 2019 model year engine using gasoline having the specifications listed in Part II, Section A.1.2, both exhaust and evaporative emission testing shall be conducted by the manufacturer with gasoline having the specifications listed in Part II, Section A.1.2, and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications listed in Part II, Section A.1.2.

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

Additives	Sufficient to meet requirements of §2257, title 13 CCR	
Copper Corrosion	No. 1	D 130-88
Gum, washed	3.0 mg/100 mL (max)	D 381-86
Oxidation Stability	1000 minutes (min)	D 525-88
Specific Gravity	Report [h]	
Heat of Combustion	Report [h]	
Carbon	Report wt. % [h]	
Hydrogen	Report wt. % [h]	

[a] The gasoline must be blended from typical refinery feedstocks.

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

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

[d] The range for interlaboratory testing is 195-215^{o} F.

[e] The range for interlaboratory testing is 285-305^{o} F.

[f] The range for interlaboratory testing is 0.7-1.1 percent by volume.

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

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

1.2 Certification Gasoline Fuel Specifications for the 2020 and Subsequent Model Years.

Add the following subparagraph which reads: For 2020 and subsequent model engines, gasoline having the specifications listed below shall be used in exhaust and evaporative emission testing and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications listed below.

California Certification Gasoline Specifications for the 2020 and Subsequent Model Years		
Fuel Property [a]	**Limit**	**Test Method [b]**
Octane (R+M)/2 [f]	87-88.4; 91 (min)	D 2699-88, D 2700-88
Sensitivity	7.5 (min)	D 2699-88, D 2700-88
Lead	0-0.01g/gal (max); no lead added	§2253.4(c), title 13 CCR
Distillation Range:		§2263, title 13 CCR [c]
10% point	130-150 ^{o}F	
50% point [d]	205-215 ^{o}F	

— 90% point [e]	310-320 °F	
— EP, maximum	390 °F	
Residue	2.0 vol. % (max)	
Sulfur	8-11 ppm by wt.	§2263, title 13 CCR
Phosphorous	0.005 g/gal (max)	§2253.4(c), title 13 CCR
RVP	6.9-7.2 psi	§2263, title 13 CCR
Olefins	4.0-6.0 vol. %	§2263, title 13 CCR
Total Aromatic Hydrocarbons	19.5-22.5 vol. %	§2263, title 13 CCR
Benzene	0.6-0.8 vol. %[f]	§2263, title 13 CCR
Multi-substituted Alkyl Aromatic Hydrocarbons	13-15 vol. %[g]	
MTBE	0.05 vol. %	§2263, title 13 CCR
Ethanol	9.8-10.2 vol. %	
Total Oxygen	3.3-3.7 wt. %	§2263, title 13 CCR
Additives	Sufficient to meet requirements of §2257, title 13 CCR	
Copper Corrosion	No. 1	D 130-88
Gum, washed	3.0 mg/100 mL (max)	D 381-86
Oxidation Stability	1000 minutes (min)	D 525-88
Specific Gravity	Report [h]	
Heat of Combustion	Report [h]	
Carbon	Report wt. % [h]	
Hydrogen	Report wt. % [h]	

[a] The gasoline must be blended from typical refinery feedstocks.

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

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

[d] The range for interlaboratory testing is 195-215° F.

[e] The range for interlaboratory testing is 285-305° F.

[f] The range for interlaboratory testing is 0.7-1.1 percent by volume.

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

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

[i] For vehicles/engines that require the use of premium gasoline as part of their warranty, the Octane ((R+M)/2) shall be a 91 minimum. All other certification gasoline specifications, as shown in this table, must be met. For all other vehicles/engines, the Octane ((R+M)/2) shall be 87-88.4.

2. Alcohol Fuel Specifications.

Amend §86.1313-94(c) as follows:

2.1 Delete subparagraphs (c)(1) and (c)(2); replace with:

(c)(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 Part II subparagraph 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 Part II subparagraph 1.	1.0 ± 0.1 vol. percent

(c)(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).

2.2 Subparagraph (c)(3). [No Change]

2.3 Add the following subparagraph.

2.3.1 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. Mixtures of Petroleum and Alcohol Fuels for Flexible Fuel Vehicles.

Amend §86.1313-94(d) as follows:

3.1 Delete subparagraphs (d)(1) and (d)(2); replace with:

(d)(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
M-85 Fuel Methanol	
Petroleum fuel meeting the specifications of Part II subparagraph 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 Part II subparagraph 1.	15-21 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.

(d)(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 Part II, subparagraph 1 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.

3.2 Subparagraph (d)(3). [No Change]

3.3 Add the following subparagraphs.

(a) **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 Part II subparagraph 1 of 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.

(b) **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.

4. Natural Gas Fuel Specifications.

4.1 Delete subparagraph (e).

4.2 Add the following subparagraphs:

(a) **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
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

(b) **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. Liquefied Petroleum Gas Fuel Specifications.

5.1 Delete subparagraph (f).

5.2 Add the following subparagraphs:

(a) **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
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

(b) **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. Subparagraph (g). [No Change]

B. California Provisions.

1. 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 a new clean fuel are not specifically set forth in paragraph 86.1313-94 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 NMOG (on a reactivity-adjusted basis), NOx, CO, and the potential risk associated with toxic air contaminants, as determined pursuant to the procedures set forth in "California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels through 2014" or the "California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years," as applicable. In the case of fuel-flexible vehicles or dual-fuel vehicles which 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.~~

~~86.1314-94 Analytical gases. June 30, 1995.~~
~~86.1316-94 Calibration; frequency and overview. September 5, 1997.~~
~~86.1318-84 Engine dynamometer system calibrations. November 16, 1983.~~
~~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.~~
~~86.1340-94 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.~~

~~**A. Federal Provisions.**~~

~~Add the following calculation:~~

~~Organic material non-methane hydrocarbon equivalent mass for ethanol vehicles:~~

$$\mathrm{OMNMHCE}_{\mathrm{mass}} = \mathrm{NMHC}_{\mathrm{mass}} + \left(\frac{13.8756}{32.042}\right) * \left(\mathrm{CH_3OH}\right)_{\mathrm{mass}} + \left(\frac{13.8756}{23.035}\right) * \left(\mathrm{CH_3CH_2OH}\right)_{\mathrm{mass}} + \left(\frac{13.8756}{30.0262}\right) * \left(\mathrm{HCHO}\right)_{\mathrm{mass}} + \left(\frac{13.8756}{22.027}\right) * \left(\mathrm{CH_3CHO}\right)_{\mathrm{mass}}$$

~~**B. California Provisions.**~~

Date of Release: September 2, 2014; 45-day Notice Version
Date of Hearing: October 23, 2014

~~1. Non-methane hydrocarbon emissions shall be measured in accordance with the "California Non-Methane Organic Gas Test Procedures," which is incorporated by reference in section 1956.8(d), title 13, CCR.~~

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

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

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Subpart B – Emission Standards and Related Requirements

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

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PART 1065 – ENGINE-TESTING PROCEDURES.

Subpart A – Applicability and General Provisions.

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

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3. Subparagraph (c) through (~~g~~h). [No change.]

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

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1065.10 Other procedures. ~~April 30, 2010~~ April 28, 2014.
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.

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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.

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

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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.

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Flow-Related Measurements

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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.

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CO and CO_2 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.

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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.

NOx 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_2O measurement devices. ~~September 15, 2011~~ April 28, 2014.

O_2 Measurements

1065.280 Paramagnetic and magnetopneumatic O_2 detection analyzers. ~~September 15, 2011~~ April 28, 2014.

Air-to Fuel Ratio Measurements

1065.284 Zirconia (ZrO_2) analyzer. ~~September 15, 2011~~ April 28, 2014.

PM Measurements

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

Subpart D – Calibrations and Verifications.

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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

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

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CO and CO_2 Measurements

1065.350 H_2O interference verification for CO_2 NDIR analyzers. ~~September 15, 2011~~ April 28, 2014.
1065.355 H_2O and CO_2 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 O_2 interference verification. ~~June 30, 2008~~ April 28, 2014.
1065.365 Nonmethane cutter penetration fractions. ~~October 30, 2009~~ April 28, 2014.
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. ~~September 15, 2011~~ April 28, 2014.

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1065.375 Interference verification for N_2O analyzers. April 28, 2014.
1065.376 Chiller NO_2 penetration. ~~June 30, 2008~~ April 28, 2014.

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Subpart E – Engine Selection, Preparation, and Maintenance.

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

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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.
~~1065.365 Nonmethane cutter penetration fractions. October 30, 2009.~~
1065.516 Sample system decontamination and preconditioning. April 28, 2014.
1065.518 Engine preconditioning. April 28, 2014.
1065.520 Pre-test verification procedures and pre-test collection. April 28, 2014.

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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 verification~~validation,~~ and drift verification~~validation, and drift correction~~. ~~September 15, 2011~~ April 28, 2014.
1065.590 PM sample~~e~~ing media (e.g., filters) preconditioning and tare weighing. June 30, 2008.

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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. ~~*September 15, 2011*~~ June 17, 2013 April 28, 2014.
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~~ April 28, 2014.
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_4 determination. September 15, 2011.
1065.665 THCE and NMHCE determination. ~~June 30, 2008~~ April 28, 2014.

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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.

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3. Subparagraphs (c) through (f). [No change.]
~~4. Amend subparagraph (d) as follows: *Fuel specifications*.~~
~~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.

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~~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~~ 40 CFR Part 1065, subpart H as amended herein. Prior to adopting such specifications, the state board shall consider the relative cost-effectiveness of use of the fuel in reducing emissions compared to the use of other fuels. Whenever the state board adopts specifications for a new clean fuel for certification testing, it shall also establish by regulation specifications for the fuel as it is sold commercially to the public.

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1065.703 Distillate diesel fuel. ~~April 30, 2010~~ April 28, 2014. [n/a]
1065.705 Residual and intermediate residual fuel. ~~June 30, 2008~~ April 28, 2014.
1065.710 Gasoline. ~~June 30, 2008~~ April 28, 2014.

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

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

For 2004 through 2019 model engines certifying in accordance with these test procedures, gasoline having the specifications listed below may be used in exhaust and evaporative emission testing as an option to the specifications ~~referred to~~ in §1065.710(c). If a manufacturer elects to utilize this option, both exhaust and evaporative emission testing shall be conducted by the manufacturer with gasoline having the specifications listed below, and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications listed below. For the 2015 through 2019 model years, gasoline having the specifications listed in the following section (b)(2) or gasoline having the specifications in §1065.710(b), may be used in exhaust and evaporative emission testing as an option to the specifications ~~referred to~~ in §1065.710(c) and this section (b)(1). If a manufacturer elects to certify a 2015 through 2019 model year engine using gasoline having the specifications listed in the following section (b)(2), both exhaust and evaporative emission testing shall be conducted by the manufacturer with gasoline having the specifications listed in the following section (b)(2), and the Executive Officer shall conduct exhaust and evaporative emission testing with gasoline having the specifications listed in the following section (b)(2).

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

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

California Certification Gasoline Specifications for the 2020 and Subsequent Model Years		
Fuel Property[(a)]	**Limit**	**Test Method [(b)]**
Octane (R+M)/2[(i)]	87-88.4; 91 (min)	D 2699-88, D 2700-88
Sensitivity	7.5 (min)	D 2699-88, D 2700-88
Lead	0-0.01g/gal (max); no lead added	§2253.4(c), title 13 CCR
Distillation Range:		§2263, title 13 CCR[(c)]

10% point	130-150 ^{o}F	
50% point [(d)]	205-215 ^{o}F	
90% point [(e)]	310-320 ^{o}F	
EP, maximum	390 ^{o}F	
Residue	2.0 vol. % (max)	
Sulfur	8-11 ppm by wt.	§2263, title 13 CCR
Phosphorous	0.005 g/gal (max)	§2253.4(c), title 13 CCR
RVP	6.9-7.2 psi	§2263, title 13 CCR
Olefins	4.0-6.0 vol. %	§2263, title 13 CCR
Total Aromatic Hydrocarbons	19.5-22.5 vol. %	§2263, title 13 CCR
Benzene	0.6-0.8 vol. %[(f)]	§2263, title 13 CCR
Multi-substituted Alkyl Aromatic Hydrocarbons	13-15 vol. %[(g)]	
MTBE	0.05 vol. %	§2263, title 13 CCR
Ethanol	9.~~8~~6-10.~~2~~0 vol. %	§2263, title 13 CCR
Total Oxygen	3.3-3.7 wt. %	§2263, title 13 CCR
Additives	Sufficient to meet requirements of §2257, title 13 CCR	
Copper Corrosion	No. 1	D 130-88
Gum, washed	3.0 mg/100 mL (max)	D 381-86
Oxidation Stability	1000 minutes (min)	D 525-88
Specific Gravity	Report [(h)]	
Heat of Combustion	Report [(h)]	
Carbon	Report wt. % [(h)]	
Hydrogen	Report wt. % [(h)]	

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

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

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

[(d)] The range for interlaboratory testing is 195-215^{o} F.

[(e)] The range for interlaboratory testing is 285-305^{o} F.

[(f)] The range for interlaboratory testing is 0.7-1.1 percent by volume.

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

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

(i) For vehicles/engines that require the use of premium gasoline as part of their warranty, the Octane ((R+M)/2) shall be a 91 minimum. All other certification gasoline specifications, as shown in this table, must be met. For all other vehicles/engines, the Octane ((R+M)/2) shall be 87-88.4.

1065.715 Natural gas. ~~June 30, 2008~~ April 28, 2014.

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

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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.

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.

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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 K – Definitions and Other Reference Information.

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

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