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Barclays Official California Code of Regulations

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 Title 13. Motor Vehicles (Refs & Annos)  
 Division 3. Air Resources Board  
 Chapter 1. Motor Vehicle Pollution Control Devices  
 Article 2. Approval of Motor Vehicle Pollution Control Devices (New Vehicles)

13 CCR § 1956.8

**§ 1956.8. Exhaust Emissions Standards and Test Procedures--1985 and Subsequent Model Heavy-Duty Engines and Vehicles, 2021 and Subsequent Zero-Emission Powertrains, and 2022 and Subsequent Model Heavy-Duty Hybrid Powertrains.**

Currentness

(a)(1) The exhaust emissions (i) from new 1985 through 2003 model heavy-duty diesel engines (except methanol-fueled engines), and heavy-duty natural-gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and (ii) from all new 1993 through 2003 model heavy-duty methanol-fueled, diesel engines, except in all cases engines used in medium-duty vehicles, shall not exceed:

**Exhaust Emission Standards****For 1985-2003 Model Heavy-Duty Engines Other than Urban Bus Engines (grams per brake horsepower-hour [g/bhp-hr])**

<b>Model Year</b>	<b>Total Hydrocarbons or OMHCE <sup>A</sup></b>	<b>Optional Non- methane Hydrocarbons <sup>A</sup></b>	<b>Carbon Monoxide</b>	<b>Oxides of Nitrogen</b>	<b>Particulates</b>
#1985-1986	1.3		15.5	5.1	--
1987 <sup>B</sup>	1.3		15.5	5.1	--
1988-1989	1.3		15.5	6.0	0.60
1990	1.3	1.2	15.5	6.0	0.60
1991-1993 <sup>C</sup>	1.3	1.2	15.5	5.0	0.25 <sup>D</sup>
1994-1997	1.3	1.2	15.5	5.0	0.10 <sup>D</sup>
1995-1997 <sup>E</sup>	1.3	1.2	15.5	3.5 to 0.5	0.10
1998-2003 <sup>E</sup>	1.3	1.2	15.5	4.0 <sup>G</sup> , <sup>H</sup>	0.10 <sup>G</sup>
1998-2003 <sup>E</sup>	1.3	1.2	15.5	2.5 to 0.5 <sup>I</sup>	0.10

<sup>A</sup> The total or optional non-methane hydrocarbon standards apply to petroleum-fueled, natural-gas-fueled and liquefied-petroleum-gas-fueled engines. The Organic Material Hydrocarbon Equivalent, or OMHCE, standards apply to methanol-fueled engines.

<sup>B</sup> As an option a manufacturer may elect to certify to the 1988 model-year emission standards one year early, for the 1987 model year.

<sup>C</sup> For methanol-fueled engines, these standards shall be applicable beginning with the 1993 model year.

<sup>D</sup> Emissions averaging may be used to meet this standard. Averaging is restricted to within each useful life subclass and is applicable only through the 1995 model year. Emissions from engines used in urban buses shall not be included in the averaging program.

<sup>E</sup> These are optional standards. A manufacturer may elect to certify to an optional NOx standard between the values, inclusive, by 0.5 grams per brake horsepower-hour increments. Engines certified to any of these optional NOx standards are not eligible for participation in any averaging, banking or trading programs described in "California Exhaust Emission

Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” incorporated by reference in (b), below.

**E** These are mandatory standards.

**G** Engines of 1998 through 2003 model years may be eligible to generate banking credits based on these standards according to the requirements of the averaging, banking and trading programs described in “California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” incorporated by reference in (b), below.

**H** May be used as the certification standard for the higher emitting fueling mode of an engine certified under the dual fueling mode certification process of (a)(3)(4), below.

**I** May be used as the certification standard for the lower emitting fueling mode of an engine certified under the dual fueling mode certification process of (a)(3)(4), below.

(2)(A) The exhaust emissions from new 2004 through 2023 model heavy-duty diesel engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and heavy-duty methanol-fueled diesel engines, and the optional, reduced-emission standards for 2002 through 2023 model engines produced beginning October 1, 2002, except in all cases engines used in medium-duty vehicles, shall not exceed:

**Exhaust Emission Standards for 2004 Through 2023 Model**

**Heavy-Duty Engines, and Optional, Reduced Emission Standards for 2002 Through 2023 Model Heavy-Duty Engines Produced Beginning**

**October 1, 2002, Other than Urban Bus Model-Year Engines Produced From October 1, 2002 Through 2006 <sup>L</sup> (grams per brake horsepower-hour [g/bhp-hr])**

<i>Model Year</i>	<i>Oxides of Nitrogen Plus Non-methane Hydrocarbons</i>	<i>Optional Oxides of Nitrogen Plus Non-methane Hydrocarbons</i>	<i>Oxides of Nitrogen</i>	<i>Optional Oxides of Nitrogen</i>	<i>Non-methane hydrocarbons</i>	<i>Carbon Monoxide</i>	<i>Particulates</i>
2004-2006 <sup>H</sup>	2.4 <sup>A, C, E, J</sup>	2.5 <sup>B, C, E, J</sup>	n/a		n/a	15.5	0.10 <sup>C</sup>
October 1, 2002-2006	n/a	1.8 to 0.3 <sup>A, D, F</sup>	n/a		n/a	15.5	0.03 to 0.01 <sup>G</sup>
2007-2023 <sup>M</sup>	n/a	n/a	0.20 <sup>I</sup>		0.14	15.5	0.01 <sup>K</sup>
2015-2021 (Optional) <sup>N, O</sup>	n/a	n/a	n/a	0.10, 0.05, or 0.02	0.14	15.5	0.01
2022-2023 (Optional) <sup>N, O</sup>	n/a	n/a	n/a	0.10, 0.05, 0.02, or 0.01	0.14	15.5	0.01

<sup>A</sup> This is the standard for the arithmetic sum of the oxides of nitrogen exhaust component certification value and the non-methane hydrocarbon exhaust component certification value, without individual restriction on the individual component values.

<sup>B</sup> This is the standard for the arithmetic sum of the oxides of nitrogen exhaust component certification value and the non-methane hydrocarbon exhaust component certification value, with the non-methane hydrocarbon individual component value not to exceed 0.5 g/bhp-hr.

<sup>C</sup> For 2004 through 2006 model years, emissions averaging may be used to meet this standard. Averaging must be based on the requirements of the averaging, banking and trading programs described in “California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” incorporated by reference in section 1956.8(b), below.

<sup>D</sup> A manufacturer may elect to certify to an optional reduced-emission NOx+NMHC standard between the values, inclusive, by 0.3 grams per brake horsepower-hour increments. Engines certified to any of these optional reduced-emission NOx standards are not eligible for participation in any averaging, banking or trading programs described in “California Exhaust Emission Standards and

Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” incorporated by reference in section 1956.8(b), below.

<sup>E</sup> May be used as the certification standard for the higher emitting fueling mode of an engine certified under the dual fueling mode certification process of section 1956.8(a)(4), below.

<sup>F</sup> May be used as the certification standard for the lower emitting fueling mode of an engine certified under the dual fueling mode certification process of section 1956.8(a)(4), below.

<sup>G</sup> A manufacturer may elect to certify to an optional reduced-emission PM standard between the specified values, inclusive, by 0.01 grams per brake horsepower-hour increments. Engines certified to any of these optional reduced-emission PM standards are not eligible for participation in any averaging, banking or trading programs described in “California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” incorporated by reference in section 1956.8(b), below.

<sup>H</sup> Engine manufacturers subject to the Heavy-Duty Diesel Engine Settlement Agreements (Settlement Agreements) <sup>1</sup> must produce engines in compliance with the requirements contained in their respective Settlement Agreement. Most engine manufacturers subject to the Settlement Agreements are required to manufacture engines meeting the exhaust emission standards for 2004 and subsequent model years engines beginning October 1, 2002.

<sup>I</sup> A manufacturer may elect to include any or all of its heavy-duty diesel engine families in any or all of the NOx emissions averaging, banking, or trading programs for heavy-duty diesel engines, within the restrictions described in “California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” incorporated in section 1956.8 (b), below. If the manufacturer elects to include engine families in any of these programs, the NOx family emission limit (FEL) may not exceed the following FEL caps: 2.00 grams per brake horsepower-hour (0.75 grams per megajoule) for model years before 2010; 0.50 grams per brake horsepower-hour (0.19 grams per megajoule) for model years 2010 and later. The FEL cap applies whether credits for the engine family are derived from averaging, banking, or trading programs.

<sup>J</sup> For 2007 through 2009 model years, a manufacturer may use these emission standards in accordance with section 1956.8 (a)(2) (B). A manufacturer may elect to include any or all of its heavy-duty diesel engine families in any or all of the NOx plus NMHC emissions averaging, banking, or trading programs for heavy-duty diesel engines, within the restrictions described in “California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” incorporated in section 1956.8 (b), below. If the manufacturer elects to include engine families in any of these programs, the NOx family emission limit (FEL) may not exceed the following FEL caps: 2.00 grams per brake horsepower-hour (0.75 grams per megajoule) for model years. The FEL cap applies whether credits for the engine family are derived from averaging, banking, or trading programs.

<sup>K</sup> A manufacturer may elect to include any or all of its heavy-duty diesel engine families in any or all of the particulate averaging, banking, or trading programs for heavy-duty diesel engines, within the restrictions described in “California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” incorporated by reference in section 1956.8 (b), below. The particulate FEL for each engine family a manufacturer elects to include in any of these programs may not exceed an FEL cap of 0.02 grams per brake horsepower-hour (0.0075 grams per megajoule). The FEL cap applies whether credits for the engine family are derived from averaging, banking, or trading programs.

<sup>L</sup> For 2007 through 2023 model-year urban bus engines, this section applies. For urban bus model-year engines produced from October 1, 2002 through 2006, refer to section 1956.1.

<sup>M</sup> For model years between 2007 and 2009, transit agencies purchasing urban buses and/or urban bus engines shall meet the requirements set forth in section 2023.1.

<sup>N</sup> Optional Low NOx emission standards. A manufacturer may choose to offer an engine that is 50%, 75%, or 90% (or 95% for 2022 and 2023 model year engines) below the current 0.20 g/bhp-hr NOx emission standards for heavy duty engines. A manufacturer may not include an engine family certified to the optional NOx emission standards in the ABT programs for NOx but may include it for particulates.

<sup>O</sup> On-Board Diagnostic (OBD) requirements are to be followed per title 13, CCR, section 1971.1 with the exception of the NOx emission threshold malfunction criteria for all applicable monitors, in which case a malfunction criterion of 0.4 g/bhp-hr NOx shall be used (i.e., the OBD system is required to detect a malfunction before NOx emissions exceed 0.4 g/bhp-hr).

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

#### (B) Phase-in Options.

1. Early NOx compliant engines. For model years 2007, 2008, and 2009, a manufacturer may, at their option, certify one or more of their engine families to the combined NOx plus NMHC standard or FEL applicable to model year 2006 engines under section 1956.8 (a)(2)(A), in lieu of the separate NOx and NMHC standards or FELs applicable to the 2007 through 2023 model years, specified in section 1956.8 (a)(2)(A). Each engine certified under this phase-in option must comply with all other emission requirements applicable to model year 2007 engines. To qualify for this option, a manufacturer must

satisfy the U.S.-directed production requirement of certifying no more than 50 percent of engines to the NOx plus NMHC standards or FELs applicable to 2006 engines, as specified in 40 Code of Federal Regulations, part 86, section 86.007-11(g)(1), as adopted January 18, 2001. In addition, a manufacturer may reduce the quantity of engines that are required to be phased-in using the early certification credit program specified in 40 Code of Federal Regulations, part 86, section 86.007-11(g)(2), as adopted January 18, 2001, and the "Blue Sky" engine program specified in 40 Code of Federal Regulations, part 86, section 86.007-11(g)(4), as adopted January 18, 2001.

2. Early PM compliant engines. A manufacturer certifying engines to the 2007 through 2023 model year PM standard listed in section 1956.8(a)(2)(A) (without using credits, as determined in any averaging, banking, or trading program described in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," to comply with the standards) before model year 2007 may reduce the number of engines that are required to meet the 2007 through 2023 model year PM standard listed in section 1956.8(a)(2)(A) in model year 2007, 2008 and/or 2009. To qualify for this option, a manufacturer must satisfy the PM emission requirements pursuant to the methods detailed in 40 Code of Federal Regulations, part 86, section 86.007-11 (g)(2)(ii), as adopted January 18, 2001.

(C)1. Except as provided in subsection (a)(2)(C)2 and (a)(2)(F) below, the exhaust emissions from new 2024 through 2026 model heavy-duty diesel engines, urban bus engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and heavy-duty methanol-fueled diesel engines, in all cases engines used in heavy-duty vehicles over 14,000 pounds GVWR, shall not exceed:

**Exhaust Emission Standards for 2024 through 2026 Model Light Heavy-Duty Engines, Medium Heavy-Duty Engines and Heavy Heavy-Duty Engines (g/bhp-hr)**

Test Procedure	Oxides of Nitrogen	Non-methane Hydrocarbons	Carbon Monoxide	Particulates
FTP cycle	0.050	0.14	15.5	0.005
RMC cycle	0.050	0.14	15.5	0.005
Low-load cycle	0.200	0.14	15.5	0.005

2. 2024 through 2026 model year heavy-duty diesel engines rated at or greater than 525 bhp maximum power as defined in 40 CFR section 1065.510, as amended March 10, 2021 (Pre-publication), incorporated by reference herein.

a. In lieu of compliance with the requirements specified in subsection (a)(2)(C)1 above, a manufacturer may elect to certify a heavy-duty engine family or families rated at or above 525 bhp by:

- i. submitting the federal engine family certification approval (e.g., federal certificate of conformity) for the applicable engine family or families and complying with all federal requirements for heavy-duty engines,
- ii. demonstrating compliance with the Heavy-Duty Diesel Engine Idling Requirements for that model year as provided in subsection (a)(6) below, and
- iii. providing emission warranty requirements for that model year as specified in 13 CCR section 2036.

b. A manufacturer is only eligible to utilize this option if it meets the criteria identified in subsections (a)(2)(C)2.b.i to ii below.

i. The manufacturer must have certified and sold heavy-duty diesel engines rated at or above 525 bhp maximum power in California for either the 2018 or 2019 model year.

ii. The maximum number of heavy-duty diesel engines covered by engine families certified under this provision that a manufacturer may sell in California in each applicable model year under this provision must not exceed 1.10 times that manufacturer's 2018 or 2019 model year California sales volume of engines rated at or above 525 bhp, whichever is greater.

3. For 2024 and 2025 model year heavy-duty diesel engine families rated below 525 bhp maximum power as defined in 40 CFR § 1065.510, as amended March 10, 2021 (Pre-publication), incorporated by reference herein, a manufacturer may elect to certify a heavy-duty diesel engine family or families with  $0.100 < \text{FTP NOx FEL} \leq 0.20 \text{ g/bhp-hr}$ , and  $0.005 < \text{FTP PM FEL} \leq 0.01 \text{ g/bhp-hr}$  if it meets the criteria set forth below in subparagraphs a. and b. below:

a. The engine family meets the applicable regulatory requirements specified in title 13, CCR, section 1956.8 with the following allowances:

- i. The low-load cycle emission standards in title 13, CCR, section 1956.8(a)(2)(C)1 would not be applicable.
- ii. In lieu of meeting the requirements specified in subparagraph § 86.1370.B.6 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b), the engine family must comply with the requirements for a 2023 model year engine family, as set forth in

subparagraphs § 86.1370.A through § 86.1370.B.5 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).

iii. In lieu of meeting the requirements specified in subparagraph § 86.004-26.B of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b), the engine family must comply with the requirements for a 2023 model year engine family, as set forth in subparagraph § 86.004-26.A of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).

iv. Comply with the heavy-duty OBD requirements specified in title 13, CCR, sections 1971.1 and 1971.5 applicable to a 2023 model year engine family.

b. A manufacturer is only eligible to utilize this option if it meets all of the criteria identified in subparagraphs i through vi below.

i. The manufacturer must certify the engine family subject to the averaging, trading, and banking provisions in section § 86.xxx-15.B.3 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).

ii. The maximum family emission limit for the engine family must not exceed the specified values in section § 86.xxx-15.B.3.(i) of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).

iii. The manufacturer must offset its model year NOx and PM deficit balance generated by legacy engines by using credits from the heavy-duty zero-emission averaging set described in section § 86.xxx-15.B.3.(j) of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).

1. If a sufficient quantity of heavy-duty zero-emission NOx or PM credits are not available, or are only available for a cost exceeding \$4,000 (for enough NOx or PM credits to offset one medium heavy-duty legacy engine), the manufacturer may submit a plan for Executive Officer approval to use credits from the same averaging set described in section § 86.xxx-15.B.3.(a) of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b), to offset any remaining model year deficit balance generated by legacy engines. The plan must include information describing the manufacturer's attempts to purchase heavy-duty zero-emission NOx or PM credits from all manufacturers who have certified heavy-duty zero-emission vehicles or powertrains with CARB and that the manufacturer was denied a fair market offer to purchase such credits (i.e., such credits were only available at a cost exceeding \$4,000 for enough NOx or PM credits to offset one medium heavy-duty legacy engine). The Executive Officer will base his or her determination upon the information included in the plan and the exercise of good engineering judgment that the information substantiates that sufficient heavy-duty zero-emission NOx or PM credits were not available or were only available at a cost exceeding \$4,000 (for enough NOx or PM credits to offset one medium heavy-duty legacy engine).

2. If credits from the same averaging set are not available, the manufacturer may carryover the NOx or PM deficit balance generated by legacy engines until the end of the 2026 model year, provided the manufacturer offsets the remaining legacy engine generated deficit balance times 1.25 with credits from the heavy-duty zero-emission averaging set or the same averaging set described in section § 86.xxx-15.B.3.(a) of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b) by the end of the 2026 model year. In other words, if the deficit carried over is 1 Mg, the manufacturer would need to offset the deficit with 1.25 Mg

3. If at the end of the 2026 model year, a sufficient quantity of heavy-duty zero-emission NOx or PM credits are not available for the manufacturer to offset the remaining legacy engine generated deficit balance times 1.25, the manufacturer must do all the following for the remaining NOx or PM balance:

A. Provide documentation to the Executive Officer substantiating that the manufacturer has attempted to purchase heavy-duty NOx or PM credits from all manufacturers with such credits and was denied a fair market offer; i.e., exceeding \$4,000 for enough NOx or PM credits to offset one medium heavy-duty legacy engine.

B. Submit a plan for Executive Officer approval for projects targeted at California disadvantaged communities and that are sufficient to offset the excess emissions within five years. The plan must include project descriptions and budgets and a demonstration that the projects will achieve reductions required. The Executive Officer will base his or her determination upon the documentation provided by the manufacturer and the exercise of good engineering judgment that the plan would benefit disadvantaged communities, and would fully offset the excess emissions due to the credit deficit balance within five years. The manufacturer may submit contingency plans to be assessed and approved on the same standard as set forth in this subsection.

C. At the end of the five-year period, submit information documenting that the excess emissions have been offset. Failure to do so means that legacy engines would be subject to the provisions of § 86.004-15.A.(b)(5) of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).

iv. For each certifying heavy-duty diesel engine manufacturer, the total California sales volume of legacy engines certified under this provision may not exceed 45 percent of the manufacturer's total actual California sales of heavy-duty diesel engines for 2024 model year, and 25 percent of the manufacturer's total actual California sales of heavy-duty diesel engines for 2025 model year.

v. NOx and PM deficits generated by legacy engines are subject to the provisions of § 86.004-15.A.(b)(5) of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).

vi. In order to certify legacy engines in a particular model year, a manufacturer must also certify one or more heavy-duty diesel engine families subject to the standards in title 13, CCR, section 1956.8(a)(2)(C)1 in the same model year.

(D) Except as provided in subsection (a)(2)(F) below, the exhaust emissions from new 2027 and subsequent model heavy-duty diesel engines, urban bus engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and heavy-duty methanol-fueled diesel engines, in all cases engines used in heavy-duty vehicles over 14,000 pounds GVWR, shall not exceed:

**Exhaust Emission Standards for 2027 and Subsequent Model Light Heavy-Duty Engines, and Medium Heavy-Duty Engines (g/bhp-hr)**

<i>Test Procedure</i>	<i>Oxides of Nitrogen</i>	<i>Non-methane Hydrocarbons</i>	<i>Carbon Monoxide</i>	<i>Particulates</i>
FTP cycle	0.020	0.14	15.5	0.005
RMC cycle	0.020	0.14	15.5	0.005
Low-load cycle	0.050	0.14	15.5	0.005

**Exhaust Emission Standards for 2027 Through 2030 Model Heavy Heavy-Duty Engines (g/bhp-hr)**

<i>Test Procedure</i>	<i>Intermediate Useful Life Oxides of Nitrogen</i>	<i>Oxides of Nitrogen</i>	<i>Non-methane Hydrocarbons</i>	<i>Carbon Monoxide</i>	<i>Particulates</i>
FTP cycle	0.020	0.035	0.14	15.5	0.005
RMC cycle	0.020	0.035	0.14	15.5	0.005
Low-load cycle	0.050	0.090	0.14	15.5	0.005

**Exhaust Emission Standards for 2031 and Subsequent Model Heavy Heavy-Duty Engines (g/bhp-hr)**

<i>Test Procedure</i>	<i>Intermediate Useful Life Oxides of Nitrogen</i>	<i>Oxides of Nitrogen</i>	<i>Non-methane Hydrocarbons</i>	<i>Carbon Monoxide</i>	<i>Particulates</i>
FTP cycle	0.020	0.040	0.14	15.5	0.005
RMC cycle	0.020	0.040	0.14	15.5	0.005
Low-load cycle	0.050	0.100	0.14	15.5	0.005

(E) The exhaust emissions from new 2024 and subsequent model heavy-duty diesel engines, urban bus engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and heavy-duty methanol-fueled diesel engines, in all cases engines used in heavy-duty vehicles over 14,000 pounds GVWR, certified to optional low NOx exhaust emission standards shall not exceed:

Optional Low NOx Exhaust Emission Standards for 2024 and Subsequent Model Heavy -Duty Diesel Engines (g/bhp-hr) <sup>A</sup>					
<i>Model Year</i>	<i>Test Procedure</i>	<i>Oxides of Nitrogen</i>	<i>Non-methane Hydrocarbons</i>	<i>Carbon Monoxide</i>	<i>Particulates</i>
2024-2026	FTP and RMC cycles / Low-load cycle	0.020/0.080 or 0.010/0.040	0.14	15.5	0.005
2027 and subsequent	FTP and RMC cycles /	0.010/0.025	0.14	15.5	0.005

[A](#) A manufacturer may not include an engine family certified to the optional NOx emission standard in the federal or California ABT programs for NOx but may include it for particulates.

*(F) Transit Agency Diesel-Fueled Bus and Engine Exemption Request*

For 2022 and subsequent model diesel-fueled medium heavy-duty or heavy heavy-duty engines used in urban buses, the Executive Officer will approve a Transit Agency Diesel-Fueled Bus and Engine Exemption Request made by a transit agency that meets each of the conditions and requirements in subparagraphs 1 and 2 below. If granted, an exemption request will allow a transit agency to purchase, rent, or lease exempt buses, contract for service with bus service providers to operate exempt buses, or re-power buses with engines that are certified to both the federal emission standards for 2010 and later model year diesel-fueled medium heavy-duty or heavy heavy-duty engines and vehicles, as set forth in title 40, Code of Federal Regulations, section 86.007-11, as last amended October 25, 2016, and the Greenhouse Gas Emissions and Fuel Economy Standards for Medium- and Heavy-Duty Engines and Vehicles - Phase 2 requirements promulgated at 81 Fed. Reg. 73,478 (October 25, 2016).

1. Conditions

- a. The transit agency is subject to the Innovative Clean Transit Regulations, California Code of Regulations, title 13, section 2023, et seq.
- b. The transit agency has fulfilled the reporting requirements of the Innovative Clean Transit Regulations specified in California Code of Regulations, title 13, section 2023.8 in the year of submitting the Transit Agency Diesel-Fueled Bus and Engine Exemption Request.
- c. The transit agency has purchased the required number of zero-emission buses in the immediately preceding year, as required by title 13, CCR, section 2023.1, or has been granted an exemption from the purchase of zero-emission bus(es) as specified in section 2023.4.
- d. If the transit agency has bus(es) fueled with compressed natural gas (CNG) in their fleet, the Transit Agency Diesel-Fueled Bus and Engine Exemption Request must include a statement with a supporting explanation from the transit agency that it is cost prohibitive for the transit agency to procure CNG-fueled bus(es) or to fuel and support additional CNG-fueled bus(es) from any established fueling facility to which the transit agency has authority or agreement to access. If the transit agency has authority or agreement to access an established CNG fueling facility, the transit agency must also submit documentation that contains information about the fueling capacity of its established CNG fueling facility and how the transit agency has fully utilized this fueling capacity.
- e. If the transit agency has previously received an Executive Exemption Approval Letter from the Executive Officer as described in title 13, CCR, section 1956.8(a)(2)(F)3, the transit agency must complete the reporting requirements of section 1956.8(a)(2)(F)5.

2. Requirements and Procedures

- a. The transit agency must submit its Transit Agency Diesel-Fueled Bus and Engine Exemption Request to CARB's Executive Officer.
- b. The Transit Agency Diesel-Fueled Bus and Engine Exemption Request must be submitted by May 1st of the first calendar year in which the exemption is requested.
- c. The Transit Agency Diesel-Fueled Bus and Engine Exemption Request must identify the number of exempt buses needed for each bus type, and for each bus type how many exempt buses are planned to operate outside of NOx exempt areas.
- d. If the transit agency requests to apply the exemption request to an existing contract, the Transit Agency Diesel-Fueled Bus and Engine Exemption Request must include a copy of the contract.
- e. The Transit Agency Diesel-Fueled Bus and Engine Exemption Request must identify the number of exempt buses or re-powered buses that the transit agency requests for each calendar year within the triennial period of the Transit Agency Diesel-Fueled Bus and Engine Exemption Request, where the year the request is submitted is counted as the first calendar year. The requested number of exempted engines or buses for each calendar year must demonstrate compliance with the Innovative Clean Transit regulations' zero-emission bus purchase requirements under title 13, CCR, section 2023.1, including any approved purchase exemption request under section 2023.4.
- f. At the submission of the Transit Agency Diesel-Fueled Bus and Engine Exemption Request, if any of the requested exempt buses cannot be replaced with zero-emission buses within the triennial period of the Transit Agency Diesel-Fueled Bus and Engine Exemption Request, even if state incentive funding can offset the entire incremental cost of zero-emission bus purchase, the Transit Agency Diesel-Fueled Bus and Engine Exemption Request must include the number of the exempt buses that cannot be replaced with zero-emission buses and an explanation of which reason, under title 13, CCR, section 2023.4(c), prevents the transit agency from purchasing zero-emission buses and must also provide the supporting documentation required in 2023.4(c).

3. The Executive Officer will issue an Executive Exemption Approval Letter if all foregoing conditions and requirements in subparagraphs 1 and 2 above are met. The Executive Exemption Approval Letter will allow a triennial quota for the purchase, rent, lease, contract for service, or re-power of exempt buses or engines. The triennial quota expires at the end of the third calendar year of the triennial period.

4. If the Transit Agency Diesel-Fueled Bus and Engine Exemption Request is approved by the Executive Officer, the transit agency may proceed with engine repower or exempt bus purchase, lease, rental, or contract for service. In the instance where new exempt engines and buses will be purchased or manufactured under the contract, the Executive Exemption Approval Letter will allow the bus and engine manufacturers to sell exempt engines to and manufacture exempt buses for the transit agency that has obtained the exemption. The transit agency must notify all parties involved of the approval and provide a copy of the issued Transit Agency Diesel-Fueled Bus and Engine Exemption Approval Letter to the engine and bus dealer(s), bus manufacturer(s), and engine manufacturer(s) involved with delivering the exempt buses or engines to the transit agency.

5. The transit agency must report the following information for the prior calendar year to the Executive Officer annually by March 31. The required information pertains to buses/engines delivered in the prior calendar year.

- a. A copy of engine or bus purchase order, or purchase contract, as identified in title 13 CCR section 2023(b)(7) with the date of purchase or a lease, rental, or contract for service agreement;
- b. A copy of the certificate of conformity issued under 40 CFR section 86.007-30, as amended October 25, 2016, incorporated by reference herein, for each engine family and the model year included in the purchase or a lease, rental, or service contract agreement;
- c. The number of exempt engines and buses delivered to the transit agency or transit service contractor and what bus type(s) were delivered;
- d. For each exempt engine and bus, provide the engine make, model and engine serial number (ESN), and vehicle identification number (VIN); and
- e. Documentation of dates of delivery and in service.

6. If any of the requirements, conditions, or criteria of title 13, CCR, sections 1956.8(a)(2)(F)1.c. and 2. are not met after approval was granted, the Executive Officer shall revoke the Executive Exemption Approval Letter. A transit agency may request a hearing to review the Executive Officer's revocation of its Executive Exemption Approval Letter pursuant to the procedures set forth in title 17, CCR, section 60055.1 et. seq.

(3) Formaldehyde exhaust emissions from new 1993 and subsequent model methanol-fueled diesel engines, shall not exceed:

<i>Model Year</i>	<i>Formaldehyde (g/bhp-hr)</i>
1993-1995	0.10
1996 and subsequent	0.05

(4) An engine family whose design allows engine operation in either of two distinct alternative fueling modes, where each fueling mode is characterized by use of one fuel or a combination of two fuels and by significantly different emission levels under each mode, may certify to a different NOx or NOx plus NMHC (as applicable depending on model year) standard for each fueling mode, provided it meets the following requirements:

- (A) The NOx or NOx plus NMHC certification standard used for operation under the higher emitting fueling mode must be one of the standards denoted by footnote H in paragraph (a)(1) and footnote E in paragraph (a)(2).
- (B) The NOx or NOx plus NMHC certification standard used for operation under the lower emitting fueling mode must be one of the reduced-emission standards denoted by footnote I in paragraph (a)(1) and footnote F in paragraph (a)(2).
- (C) The engine family is not used to participate in any manufacturer's averaging, banking or trading program.
- (D) The engine family meets all other emission requirements contained in this section.
- (E) The higher emitting fueling mode must be intended only for failsafe vehicle operation when a malfunction or inadvertent fuel depletion precludes operation in the lower emitting fueling mode, as evidenced by a significantly reduced horsepower versus engine speed curve when operating in the higher emitting fueling mode when compared to the similar curve for the lower emitting fueling mode.

(5) No crankcase emissions shall be discharged directly into the ambient atmosphere from any new 2007 or later model year diesel heavy-duty diesel engine, with the following exception: heavy-duty diesel engines equipped with turbochargers, pumps, blowers, or superchargers for air induction may discharge crankcase emissions to the ambient atmosphere if the emissions are added to the exhaust emissions (either physically or mathematically) during all emission testing. Manufacturers using this exception must manufacture the engines so that all crankcase emissions can be routed into a dilution tunnel (or other sampling system approved in advance by the Executive Officer), and must account for deterioration in crankcase emissions when determining exhaust deterioration factors. For the purpose of section 1956.8(a)(2), crankcase emissions that are routed to the



exhaust upstream of exhaust aftertreatment during all operation are not considered to be “discharged directly into the ambient atmosphere.”

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

Except as provided in subsection (6)(B) below, the requirements in this subsection apply to 2008 through 2023 model diesel engines used in heavy-duty vehicles over 14,000 pounds GVWR, and 2024 and subsequent model diesel engines used in medium-duty vehicles from 10,001 to 14,000 pounds GVWR and heavy-duty vehicles over 14,000 pounds GVWR. Manufacturers may meet the requirements of this subsection by either demonstrating compliance with the Engine Shutdown System requirements of subsection (6)(A), below or the optional NOx Idling Emission Standard specified in subsection (6)(C), below.

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

1. Requirements. Except as provided in subsections (a)(6)(B) and (a)(6)(C), all new 2008 and subsequent model-year heavy-duty diesel engines shall be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to “neutral” or “park”, and the parking brake is engaged. If the parking brake is not engaged, then the engine shutdown system shall shut down the engine after 900 seconds of continuous idling operation once the vehicle is stopped and the transmission is set to “neutral” or “park.” The engine shutdown system must be tamper-resistant and non-programmable. A warning signal, such as a light or sound indicator inside the vehicle cabin, may be used to alert the driver 30 seconds prior to engine shutdown. The engine shutdown system must be capable of allowing the driver to reset the engine shutdown system timer by momentarily changing the position of the accelerator, brake, or clutch pedal, or other mechanism within 30 seconds prior to engine shutdown. Once reset, the engine shutdown system shall restart the engine shutdown sequence described in this paragraph above, and shall continue to do so until the engine shuts down or the vehicle is driven.

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

a. *If the engine is operating in power take-off (PTO) mode.*

The PTO system shall have a switch or a setting that can be switched “on” to override the engine shutdown system and will reset to the “off” position when the vehicle’s engine is turned off or when the PTO equipment is turned off. Subject to advance Executive Officer approval, other methods for detecting or activating PTO operation may be allowed; or,

b. *If the vehicle’s engine coolant temperature is below 60°F.*

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

c. If an exhaust emission control device is regenerating, and keeping the engine running is necessary to prevent aftertreatment or engine damage, the engine shutdown system may be overridden for the duration necessary to complete the regeneration process up to a maximum of 30 minutes. Determination of what constitutes the need for regeneration will be based on data provided by the manufacturer at time of certification. Regeneration events that may require longer than 30 minutes of engine idling to complete shall require advance Executive Officer approval. At the end of the regeneration process, the engine shutdown system shall automatically be enabled to restart the engine shutdown sequence described in subparagraph (a)(6)(A)1. above. A vehicle that uses a regeneration strategy under engine idling operating conditions shall be equipped with a dashboard indicator light that, when illuminated, indicates that the exhaust emission control device is regenerating. Other methods of indicating that the exhaust emission control device is regenerating may be used with advance Executive Officer approval.

d. if servicing or maintenance of the engine requires extended idling operation. The engine’s electronic control module may be set to temporarily deactivate the engine shutdown system for up to a maximum of 60 minutes. The deactivation of the engine shutdown system shall only be performed with the use of a diagnostic scan tool. At the end of the set deactivation period, the engine’s electronic control module shall reset to restart the engine shutdown system sequence described in subparagraph (a)(6)(A)1. above.

*(B) Exempt Vehicles.*

1. 2008 through 2023 model heavy-duty diesel engines to be used in buses as defined in California Vehicle Code sections 233, 612, and 642, school buses as defined in California Vehicle Code section 545, recreational vehicles as defined in Health and Safety Code section 18010, medium duty vehicles as defined in section 1900(b)(13) of title 13, California Code of Regulations (CCR), military tactical vehicles as defined in section 1905 of title 13, CCR, authorized emergency vehicles as defined in California Vehicle Code section 165, armored cars, as defined in California Vehicle Code sections 115, and workover rigs, as defined in section 2449 of title 13, CCR are exempted from these requirements.

2. 2024 and subsequent model heavy-duty engines to be used in military tactical vehicles as defined in title 13, CCR, section 1905 and authorized emergency vehicles as defined in California Vehicle Code § 165 are exempted from these requirements.

(C) *Optional NOx idling emission standard.*

1. Emission standard.

a. In lieu of the engine shutdown system requirements specified in subsection (a)(6)(A) above, an engine manufacturer may elect to certify its new 2008 through 2023 model-year heavy-duty diesel engines and 2024 through 2026 model year heavy-duty diesel engines subject to the provisions specified in subsection (a)(2)(C)2 and 2024 through 2025 model year heavy-duty diesel engines subject to the provisions specified in subsection (a)(2)(C)(3) above, to an optional NOx idling emission standard of 30 grams per hour.

b. Except as provided in subsection (a)(6)(C)1.a above, in lieu of the engine shutdown system requirements specified in subsection (a)(6)(A) above, an engine manufacturer may elect to certify its new 2024 and subsequent model year heavy-duty diesel engines to the following optional NOx idling emission standards. The optional NOx idling emissions shall not exceed:

**Optional NOx Idling Emission Standards for 2024 and Subsequent Model Diesel Engines Used in Medium-Duty Vehicles from 10,001 to 14,000 GVWR and Diesel Engines Used in Heavy-Duty Vehicles Greater than 14,000 Pounds GVWR (grams per hour)**

Model Year	Oxides of Nitrogen
2024 - 2026	10
2027 and subsequent	5

2. Compliance Determination:

a. Compliance with these optional standards will be determined based on testing conducted pursuant to the supplemental NOx idling test cycle and procedures specified in section 86.1360-2007.B.4 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in subsection (b). The manufacturer may request an alternative test procedure if the technology used cannot be demonstrated using the procedures in section 86.1360-2007.B.4, subject to advance approval of the Executive Officer.

b. A manufacturer certifying to the optional NOx idling standard must not increase emissions of CO, PM, or NMHC, determined by comparing results from the supplemental NOx idling test cycle and procedures specified in section 86.1360-2007.B.4 of the referenced "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" to emission results from the idle mode of the supplemental steady state test cycle or emission results from idle portions of the transient test cycle for heavy duty diesel engines, respectively specified in sections 86-1360-2007 and 86.1327-98 of the referenced "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles." With advance Executive Officer approval, a manufacturer may use other methods of ensuring that emissions of CO, PM, and NMHC are not adversely affected in meeting the optional NOx requirement. Also, manufacturers shall state in their application for certification that meeting the optional NOx idling requirement will not adversely affect the associated emissions of CO, PM and NMHC.

c. An engine manufacturer certifying its engine to the optional NOx idling emission standard must also produce a vehicle label, as defined in subsection 35.B.4 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in subsection (b).

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

(7) Greenhouse Gas Emission Standards for new 2014 and Subsequent Model Heavy-Duty Diesel Engines, Heavy-Duty Natural Gas-Fueled and Liquefied-Petroleum-Gas-Fueled Engines Derived from Diesel-Cycle Engines, and Heavy-Duty Methanol-Fueled Diesel Engines.

(A) The CO<sub>2</sub> emissions from new 2014 and subsequent model heavy-duty diesel engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and heavy-duty methanol-fueled diesel engines, except in all cases engines used in medium-duty vehicles, shall not exceed:

<b>CO<sub>2</sub> Emission Standards for 2014 and Subsequent Model Heavy-Duty Diesel Engines <sup>A, B, C, D</sup> (in g/hp-hr)</b>

<b>Model Years</b>	<b>Light heavy-duty -- vocational</b>	<b>Medium heavy-duty -- vocational</b>	<b>Heavy heavy-duty -- vocational</b>	<b>Medium heavy-duty -- tractor</b>	<b>Heavy heavy-duty -- tractor</b>
2014-2016	600	600	567	502	475
2017-2020	576	576	555	487	460
2017-2027 (Optional) E	490	474	446	409	387
2021-2023	563	545	513	473	447
2024-2026	555	538	506	461	436
2027 and later	552	535	503	457	432

<sup>A</sup> *Family Certification Levels.* A Family Certification Level (FCL) must be specified for each engine family, which may not be less than the certified emission level for the engine family. The Family Emission Limit (FEL) for the engine family is equal to the FCL multiplied by 1.03. The FCL serves as the CO<sub>2</sub> emission standard for the engine family with respect to certification and confirmatory testing instead of the standards specified in this subsection (a)(7)(A). The FEL serves as the emission standard for the engine family with respect to all other testing.

<sup>B</sup> *Averaging, Banking, and Trading Program and Credits.* The requirements for the optional averaging, banking, and trading program and for generating credits are described in the applicable test procedures incorporated by reference in subsection (b).

<sup>C</sup> *Alternate Phase-in Emission Standards.* Alternate phase-in emission standards may be used in lieu of the required CO<sub>2</sub> emission standards in the table above. To qualify for these alternate phase-in emission standards, the manufacturer must begin certifying all of its model year 2013 diesel engines within a given primary intended service class to the applicable alternate emission standards of this footnote (c) and continue through model year 2016. This means that once a manufacturer chooses to certify a primary intended service class to the alternate emission standards of this footnote (c), it is not allowed to opt out of these standards. Engines certified to these alternate emission standards are not eligible for early credits. Note that these alternate emission standards for 2016 and later are the same as the otherwise applicable required emission standards for model year 2017 and later.

<b>Alternate Phase-in CO<sub>2</sub> Emission Standards (in g/hp-hr)</b>					
<b>Model Years</b>	<b>Light heavy-duty -- vocational</b>	<b>Medium heavy-duty -- vocational</b>	<b>Heavy heavy-duty -- vocational</b>	<b>Medium heavy-duty -- tractor</b>	<b>Heavy heavy-duty - tractor</b>
2013-2015	618	618	577	512	485
2016	576	576	555	487	460

<sup>D</sup> *Alternate Emission Standards Based on 2011 Model Year Engines.* For model years 2014 through 2016, heavy-duty diesel engines may be certified to these alternate emission standards based on 2011 model year engines, if they are not part of an averaging set in which a balance of banked credits remain. These alternate standards are determined from the measured emission rate of the test engine of the applicable baseline 2011 engine family(ies) as described in the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles,” as incorporated by reference in section (b). The alternate CO<sub>2</sub> standard for light and medium heavy-duty vocational-certified engines is equal to the baseline 2011 emission rate multiplied by 0.975. The alternative CO<sub>2</sub> standard for tractor-certified engines and all other heavy heavy-duty engines is equal to the baseline 2011 emission rate multiplied by 0.970.

<sup>E</sup> *Optional Low-CO<sub>2</sub> Emission Standards.* Heavy-duty diesel engines certified to these Optional Low-CO<sub>2</sub> Emission Standards must also comply with the applicable methane and nitrous oxide emission standards set forth in subsections (a)(7)(B) and (a)(7)(C), respectively. In addition, engines certified to these Optional Low-CO<sub>2</sub> Emission Standards and participating in the Innovative Technology Regulation set forth in sections 2208 and 2208.1 are not eligible to participate in the averaging, banking, and trading program, or to generate credits for certification.

(B) The methane (CH<sub>4</sub>) emissions from new 2014 and subsequent model heavy-duty diesel engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and heavy-duty methanol-fueled diesel engines, except in all cases engines used in medium-duty vehicles, shall not exceed 0.10 g/hp-hr.

(C) The nitrous oxide (N<sub>2</sub>O) emissions from new 2014 and subsequent model heavy-duty diesel engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and heavy-duty methanol-fueled diesel engines, except in all cases engines used in medium-duty vehicles, shall not exceed 0.10 g/hp-hr.

(8) *Zero-Emission Powertrain Certification Standards.* Model Year (MY) 2021 and subsequent MY all-electric and hydrogen fuel-cell powertrains used in heavy-duty vehicles (over 14,000 pounds gross vehicle weight rating) and incomplete medium-duty vehicles (from 8,501 through 14,000 pounds gross vehicle weight rating) may be certified in accordance with the “California Standards and Test Procedures for New 2021 and Subsequent Model Heavy-Duty Zero-Emission Powertrains,” as adopted June 27, 2019, which is hereby incorporated by reference herein. Powertrains certified using these procedures shall be deemed to have exhaust emissions of zero for any criteria pollutant or greenhouse gas.

(9) The exhaust emissions from new 2022 and subsequent model optionally certified heavy-duty diesel hybrid powertrains used in heavy-duty vehicles over 14,000 pounds GVWR shall not exceed the emission standards in 13 CCR section 1956.8. The exhaust emission standards from new 2022 and subsequent model optionally certified diesel hybrid powertrains used in incomplete vehicles from 10,001 to 14,000 pounds GVWR shall not exceed the emission standards in 13 CCR section 1956.8.

(b) *Test Procedures.* The test procedures for determining compliance with standards applicable to 1985 and subsequent model heavy-duty diesel engines and vehicles and 2022 and subsequent model diesel hybrid powertrains, and the requirements for participating in the averaging, banking and trading programs, are set forth in the “California Exhaust Emission Standards and Test Procedures for 1985 through 2003 Model Heavy-Duty Diesel-Engines and Vehicles,” adopted April 8, 1985, as last amended December 12, 2002, the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles,” adopted December 12, 2002, as last amended September 9, 2021, and the “California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric and Other Hybrid Vehicles in the Urban Bus and Heavy-Duty Vehicle Classes,” adopted October 24, 2002, as last amended October 21, 2014, which are incorporated by reference herein.

(c)(1)(A) The exhaust emissions from (i) new 1987 through 2004 model heavy-duty Otto-cycle engines (except methanol-fueled engines and except heavy-duty Otto-cycle natural-gas-fueled and liquified-pe-troleum-gas-fueled Otto-cycle engines derived from diesel-cycle engines) and (ii) from new 1993 through 2004 model heavy-duty methanol-fueled Otto-cycle engines (except in all cases engines used in medium-duty vehicles) shall not exceed:

Exhaust Emission Standards for Heavy-Duty Otto-Cycle Engines (grams per brake horsepower-hour or g/bhp-hr)					
Model Year	Total Hydrocarbons or OMHCE <sup>A</sup>	Optional Non-Methane Hydrocarbons <sup>A</sup>	Carbon Monoxide <sup>B</sup>	Oxides of Nitrogen	
1987 <sup>C</sup>	1.1 <sup>D</sup>		14.4 <sup>D</sup>	10.6	
	1.9 <sup>E</sup>		37.1 <sup>E</sup>	10.6	
1988-1989	1.1 <sup>D</sup>		14.4 <sup>D</sup>	6.0	
	1.9 <sup>E</sup>		37.1 <sup>E</sup>	6.0	
1990	1.1	0.9 <sup>D</sup>	14.4 <sup>D</sup>	6.0	
	1.9 <sup>E</sup>	1.7 <sup>E</sup>	37.1 <sup>E</sup>	6.0	
1991-1994	1.1 <sup>D</sup>	0.9 <sup>D</sup>	14.4 <sup>D</sup>	5.0	
	1.9 <sup>E</sup>	1.7 <sup>E</sup>	37.1 <sup>E</sup>	5.0	
1995-1997	1.9 <sup>E</sup>	1.7 <sup>E</sup>	37.1 <sup>E</sup>	5.0	
	1.9 <sup>E</sup>	1.7 <sup>E</sup>	37.1 <sup>E</sup>	2.5 to 5.0 <sup>E</sup>	
1998-2003 <sup>G</sup>	1.9 <sup>E</sup>	1.7 <sup>E</sup>	37.1 <sup>E</sup>	4.0	
	1.9 <sup>E</sup>	1.7 <sup>E</sup>	37.1 <sup>E</sup>	1.5 to 0.5 <sup>E</sup>	
	Non-Methane Hydrocarbons plus Oxides of Nitrogen (NMHC + NOx)		Carbon Monoxide		
2004 <sup>G</sup>	2.4 g/bhp-hr; or 2.5 with 0.5 g/bhp-hr cap on NMHC		37.1		

<sup>A</sup> The total or optional non-methane hydrocarbon standards apply to petroleum-fueled, natural-gas-fueled and liquefied-petroleum-gas-fueled engines and methanol-fueled engines beginning in 2004. The Organic Material Hydrocarbon Equivalent, or OMHCE, standards apply to 1987 through 2003 methanol-fueled engines.

<sup>B</sup> Prior to the 2002 model year, carbon monoxide emissions from engines utilizing exhaust after treatment technology shall also not exceed 0.5 percent of the exhaust gas flow at curb idle.

<sup>C</sup> Manufacturers with existing heavy-duty Otto-cycle engines certified to the California 1986 steady-state emission standards and test procedures may as an option certify those engines, for the 1987 model year only, in accordance with the standards and test procedures for 1986 heavy-duty Otto-cycle engines established in Section 1956.7.

<sup>D</sup> These standards are applicable to Otto-cycle engines intended for use in all heavy-duty vehicles.

<sup>E</sup> Applicable to heavy-duty Otto-cycle engines intended for use only in vehicles with a gross vehicle weight rating greater than 14,000 pounds. Also, as an option, a manufacturer may certify one or more 1988 through 1994 model Otto-cycle heavy-duty engine configurations intended for use in all heavy-duty vehicles to these emission standards, provided that the total model-year sales of such configuration(s) being certified to these emission standards represent no more

than 5 percent of total model-year sales of all Otto-cycle heavy-duty engines intended for use in vehicles with a Gross Vehicle Weight Rating of up to 14,000 pounds by the manufacturer.

**E** These are optional standards and apply to all heavy-duty engines intended for use only in vehicles with a gross vehicle weight rating greater than 14,000 pounds. A manufacturer may elect to certify to an optional standard between the values, inclusive, by 0.5 grams per brake horsepower-hour increments.

**G** A manufacturer may request to certify to Option 1 or Option 2 federal NMHC + NOx standards as set forth in 40 CFR § 86.005-10(f), as adopted October 6, 2000.

(c)(1)(B) The exhaust emissions from new 2005 through 2023 model heavy-duty Otto-cycle engines, except for Otto-cycle medium- and heavy-duty engines subject to the alternative standards in 40 CFR § 86,005-10(f), shall not exceed:

California Emission Standards for 2005 through 2023 Model Heavy-Duty Otto-Cycle Engines <sup>A</sup> (in g/bhp-hr)							
Model Year	Emission Category	NMHC + NOx	NMHC	NOx	CO <sup>G</sup>	HCHO	PM
Standards for Heavy-Duty Otto-Cycle Engines Used In 2005 through 2019 Model Incomplete Medium-Duty Vehicles 8,501 to 10,000 pounds GVW <sup>B</sup> and 2005 through 2023-Model Incomplete Medium-Duty Vehicles 10,001 to 14,000 pounds GVW <sup>C</sup>							
2005 through 2007	ULEV	1.0 <sup>D, F</sup>	n/a	n/a	14.4	0.05	n/a
	SULEV	0.5	n/a	n/a	7.2	0.025	n/a
2008-2023	ULEV	n/a	0.14 <sup>F</sup>	0.20 <sup>F</sup>	14.4	0.01	0.01
	SULEV	n/a	0.07 <sup>F</sup>	0.10 <sup>F</sup>	7.2	0.005	0.005
Standards for Heavy-Duty Otto-Cycle Engines Used In Heavy-Duty Vehicles Over 14,000 pounds GVW							
2005 through 2007	n/a	1.0 <sup>D, F</sup>	n/a	n/a	37.1	0.05 <sup>E</sup>	n/a
2008-2023	n/a	n/a	0.14 <sup>F</sup>	0.20 <sup>F</sup>	14.4	0.01	0.01
2015-2021 <sup>H, I</sup>	Optional	n/a	0.14	0.10, 0.05, or 0.02	14.4	0.01	0.01
2022-2023 <sup>H, I</sup>	Optional	n/a	0.14	0.10, 0.05, 0.02, or 0.01	14.4	0.01	0.01

<sup>A</sup> These standards apply to petroleum-fueled, alcohol-fueled, liquefied petroleum gas-fueled and natural gas-fueled Otto-cycle engines.

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

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

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

<sup>E</sup> This standard only applies to methanol-fueled Otto-cycle engines.

<sup>F</sup> A manufacturer may elect to include any or all of its medium- and heavy-duty Otto-cycle engine families in any or all of the emissions ABT programs for HDEs, within the restrictions described in section 1.15 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," incorporated by reference in section 1956.8(d). For engine families certified to the Option 1 or 2 federal standards, the FEL must not exceed 1.5 g/bhp-hr. If a

manufacturer elects to include engine families certified to the 2005 through 2023 model year standards, the NOx plus NMHC FEL must not exceed 1.0 g/bhp-hr. For engine families certified to the 2008 through 2023 model year standards, the FEL is the same as set forth in 40 CFR 86.008-10(a)(1).

<sup>G</sup> Idle carbon monoxide: For all Otto-cycle heavy-duty engines utilizing aftertreatment technology, and not certified to the on-board diagnostics requirements of section 1968, et seq, as applicable, the CO emissions shall not exceed 0.50 percent of exhaust gas flow at curb idle.

<sup>H</sup> Optional Low NOx emission standards. A manufacturer may choose to offer an engine that is 50%, 75%, or 90% (or 95% for 2022 and 2023 model year engines) below the current 0.20 g/bhp-hr NOx emission standards for heavy duty engines. A manufacturer may not include an engine family certified to the optional NOx emission standards in the ABT programs for NOx but may include it for NMHC.

<sup>I</sup> On Board Diagnostic (OBD) requirements are to be followed using Title 13, CCR, section 1971.1 with the exception of the NOx emission threshold malfunction criteria for all applicable monitors, in which case the malfunction criteria shall be as follows:

(A) for monitors that require detection of a malfunction before emissions exceed 1.5 times the applicable NOx standard, a malfunction criterion of 0.3 g/bhp-hr NOx shall be used (i.e., the OBD system is required to detect a malfunction before NOx emissions exceed 0.3 g/bhp-hr).

(B) for monitors that require detection of a malfunction before emissions exceed 1.75 times the applicable NOx standard, a malfunction criterion of 0.35 g/bhp-hr NOx shall be used (i.e., the OBD system is required to detect a malfunction before NOx emissions exceed 0.35 g/bhp-hr).

(C) for monitors that require detection of a malfunction before emissions exceed 3.0 times the applicable NOx standard, a malfunction criterion of 0.6 g/bhp-hr NOx shall be used (i.e., the OBD system is required to detect a malfunction before NOx emissions exceed 0.6 g/bhp-hr).

(c)(1)(C) The exhaust emissions from 2024 and subsequent model Otto-cycle heavy-duty engines, including engines used in incomplete medium-duty vehicles from 10,001-14,000 pounds GVWR, shall not exceed:

Exhaust Emission Standards for 2024 and Subsequent Model Otto-Cycle Heavy-Duty Engines and Otto-Cycle Engines Used in Incomplete Medium-Duty Vehicles from 10,001-14,000 Pounds GVWR (g/bhp-hr) <sup>A</sup>

Test Procedure	Model Year	Oxides of Nitrogen	Non-methane Hydrocarbons	Carbon Monoxide	Formaldehyde	Particulates
FTP cycle	2024 - 2026	0.050	0.14	14.4	0.01	0.005
FTP Cycle	2027 and Subsequent	0.020	0.14	14.4	0.01	0.005

<sup>A</sup> manufacturer of engines used in incomplete medium-duty vehicles from 10,001-14,000 pounds GVWR may choose to comply with these standards as an alternative to the primary emission standards and test procedures for complete vehicles specified in section 1961.2, title 13, CCR. A manufacturer that chooses to comply with these optional heavy-duty engine standards and test procedures shall specify, in the Part I application for certification, an in-use compliance test procedure, as provided in section 2139(c), title 13, CCR. An engine certified for use in a medium-duty vehicle shall not be used in a heavy-duty vehicle over 14,000 pounds GVWR.

(c)(1)(D) The exhaust emissions from new 2024 and subsequent model Otto-cycle heavy-duty engines used in heavy-duty vehicles over 14,000 pounds GVWR, certified to optional low NOx exhaust emission standards shall not exceed:

Optional Low NOx Exhaust Emission Standards for 2024 and Subsequent Model Otto-Cycle Heavy-Duty Engines (g/bhp-hr) <sup>A</sup>

Test Procedure	Model Year	Oxides of Nitrogen	Non-methane Hydrocarbons	Carbon Monoxide	Formaldehyde	Particulates
FTP cycle	2024 - 2026	0.010 and 0.020	0.14	14.4	0.01	0.005
FTP cycle	2027 and Subsequent	0.010	0.14	14.4	0.01	0.005

<sup>A</sup> A manufacturer may not include an engine family certified to the optional NOx emission standard in the federal or California ABT programs for NOx but may include it for Non-methane hydrocarbons.

(2) Formaldehyde exhaust emissions from new 1993 and subsequent model methanol-fueled otto cycle engines shall not exceed:

Model Year	Formaldehyde (g/bhp-hr)
1993-1995	0.10

1996 and Subsequent

0.05

(3) *Optional Standards for 2023 and Earlier Model Complete and Incomplete Heavy-Duty Vehicles that Use Heavy-Duty Otto-Cycle Engines.* For 2023 and earlier model years only, manufacturers may request to group complete and incomplete heavy-duty Otto-cycle vehicles into the same test group as Otto-cycle vehicles certifying to the LEV III exhaust emission standards and test procedures specified in title 13, CCR, section 1961.2, so long as those complete and incomplete heavy-duty Otto-cycle vehicles meet the most stringent LEV III standards to which any vehicle within that test group certifies.

(4) Greenhouse Gas Emission Standards for New 2016 and Subsequent Model Heavy-Duty Otto-Cycle Engines.

(A) *CO<sub>2</sub> Emission Standards.*

1. The CO<sub>2</sub> emissions from new 2016 through 2020 model heavy-duty Otto-cycle engines, except in all cases engines used in medium-duty vehicles, shall not exceed 627 g/hp-hr. This standard continues to apply in 2021 and later model years for all Otto-cycle engines that are not heavy heavy-duty engines. An FCL must be specified for each engine family, which may not be less than the certified emission level for the engine family. The FEL for the engine family is equal to the FCL multiplied by 1.03. The FCL serves as the CO<sub>2</sub> emission standard for the engine family with respect to certification and confirmatory testing instead of the standard specified in this subsection (c)(4)(A). The FEL serves as the emission standard for the engine family with respect to all other testing. The requirements for the optional averaging, banking, and trading program and for generating credits are described in the applicable test procedures incorporated by reference in subsection (d).

2. As an option, 2017 through 2027 model year heavy-duty Otto-cycle engines, except in all cases engines used in medium-duty vehicles, may be certified to the Optional Low-CO<sub>2</sub> Emission Standard. The CO<sub>2</sub> emissions from engines certified to the Optional Low-CO<sub>2</sub> Emission Standard may not exceed 490 g/hp-hr. Engines certified to the Optional Low-CO<sub>2</sub> Emission Standard must also comply with the applicable CH<sub>4</sub> and N<sub>2</sub>O emission standards set forth in subsections (c)(4)(B) and (c)(4)(C), respectively. In addition, engines certified to the Optional Low CO<sub>2</sub> Emission Standard and participating in the Innovative Technology Regulation set forth in sections 2208 and 2208.1 are not eligible to participate in the averaging, banking, and trading program, or to generate credits for certification.

3. The CO<sub>2</sub> emissions from new 2021 and subsequent model Otto-cycle engines characterized as heavy heavy-duty engines used in heavy heavy-duty vocational vehicles and heavy heavy-duty tractors shall not exceed:

<i>Model Years</i>	<i>Heavy Heavy-Duty -- Vocational</i>	<i>Heavy Heavy-Duty -- Tractor</i>
2021-2023	513	447
2024-2026	506	436
2027 and later	503	432

(B) The CH<sub>4</sub> emissions from new 2016 and subsequent model heavy-duty Otto-cycle engines, except in all cases engines used in medium-duty vehicles, shall not exceed 0.10 g/hp-hr.

(C) The N<sub>2</sub>O emissions from new 2016 and subsequent model heavy-duty Otto-cycle engines, except in all cases engines used in medium-duty vehicles, shall not exceed 0.10 g/hp-hr.

(5) The exhaust emission standards from new 2022 and subsequent model optionally certified heavy-duty Otto-cycle hybrid powertrains used in heavy-duty vehicles over 14,000 pounds GVWR shall not exceed the emission standards in 13 CCR § 1956.8 for heavy-duty Otto-Cycle engines used in heavy-duty vehicles over 14,000 pounds GVWR.

The exhaust emission standards from new 2022 and subsequent model optionally certified Otto-cycle hybrid powertrains used in incomplete vehicles from 10,001 to 14,000 pounds GVWR shall not exceed the emission standards in 13 CCR § 1956.8 for Otto-Cycle engines used in incomplete vehicles from 10,001 to 14,000 pounds GVWR.

(d) *Test Procedures.* The test procedures for determining compliance with standards applicable to 1987 and subsequent model heavy-duty Otto-cycle engines and vehicles and 2022 and subsequent model Otto-cycle hybrid powertrains, are set forth in the "California Exhaust Emission Standards and Test Procedures for 1987 through 2003 Model Heavy-Duty Otto-Cycle Engines and Vehicles," adopted April 25, 1986, as last amended December 27, 2000, the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles," adopted December 27, 2000, as last amended September 9, 2021, and the "California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric and Other Hybrid Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes," adopted October 24, 2002, as last amended October 21, 2014, which are all incorporated by reference herein; and the "California Non-Methane Organic Gas Test Procedures for 1993 through 2016 Model Year Vehicles" and the "California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles," which are incorporated by reference in section 1961.2.

(e) A manufacturer may elect to certify complete heavy-duty vehicles of 14,000 pounds or less maximum gross vehicle weight rating as medium-duty vehicles under section 1960.1 or section 1961 of this chapter, in which event the heavy-duty emission standards and test procedures in this section shall not apply.

(f)(1) In 1985 and future years, the executive officer may authorize use of engines certified to meet federal emission standards, or which are demonstrated to meet appropriate federal emission standards, in up to a total of 100 heavy-duty vehicles, including otto-cycle and diesel heavy-duty vehicles, in any one calendar year when the executive officer has determined that no engine certified to meet California emission standards exists which is suitable for use in the vehicles.

(2) In order to qualify for an exemption, the vehicle manufacturer shall submit, in writing, to the executive officer the justification for such exemption. The exemption request shall show that, due to circumstances beyond the control of the vehicle manufacturer, California certified engines are unavailable for use in the vehicle. The request shall further show that redesign or discontinuation of the vehicle will result in extreme cost penalties and disruption of business. In evaluating a request for an exemption, the executive officer shall consider all relevant factors, including the number of individual vehicles covered by the request and the anti-competitive effect, if any, of granting the request. If a request is denied, the executive officer shall state in writing the reasons for the denial.

(3) In the event the executive officer determines that an applicant may meet the criteria for an exemption under this subsection, but that granting the exemption will, together with previous exemptions granted, result in over 100 vehicles being permitted under this subsection to use non-California engines in heavy-duty vehicles in any one calendar year, the exemption may be granted only by the state board, under the criteria set forth herein.

(g) The exhaust emissions from new 1995 through 2003 model-year engines used in incomplete medium-duty vehicles or diesel engines used in medium-duty vehicles shall not exceed:

Exhaust Emission Standards <sup>A</sup> (grams per brake horsepower-hour, or g/bhp-hr)			
Model Year	Carbon Monoxide	NMHC + NO <sub>x</sub> <sup>B</sup>	Particulates <sup>C</sup>
1995 <sup>D</sup> through 2003	14.4	3.9	0.10

<sup>A</sup> This set of standards is optional. Manufacturers of engines used in incomplete medium-duty vehicles or diesel engines used in medium-duty vehicles from 8501-14,000 pounds, gross vehicle weight may choose to comply with these standards as a alternative to the primary emission standards and test procedures specified in section 1960.1, Title 13, California Code of Regulations. Manufacturers that choose to comply with these optional heavy-duty standards and test procedures shall specify, in the application for certification, an in-use compliance test procedure, as provided in section 2139(c), Title 13, California Code of Regulations.

<sup>B</sup> This standard is the sum of the individual non-methane hydrocarbon emissions and oxides of nitrogen emissions. For methanol-fueled engines, non-methane hydrocarbons shall mean organic material hydrocarbon equivalent.

<sup>C</sup> This standard shall only apply to diesel engines and vehicles.

<sup>D</sup> In the 1995 model-year only, manufacturers may certify up to 50 percent of their medium-duty engines or vehicles to the applicable 1994 model-year standards and test procedures. For the 1995 through 1997 models, alternative in-use compliance is available for medium-duty manufacturers. A manufacturer may use alternative in-use compliance for up to 100 percent of its fleet in the 1995 and 1996 model years and up to 50 percent of its fleet in the 1997 model year. The percentages shall be determined from the manufacturers' projected California sales of medium-duty vehicles. For engines certified to the standards and test procedures of this subsection, "alternative in-use compliance" shall consist of an allowance of 25 percent over the HC + NO<sub>x</sub> standard. In-use compliance testing shall be limited to vehicles or engines with less than 90,000 miles.

(h) The exhaust emissions from new:

(1) 1992 through 2004 model-year Otto-cycle engines used in incomplete medium-duty low-emission vehicles, ultra-low-emission vehicles, and super-ultra-low-emission vehicles from 8,501 to 14,000 pounds GVWR; and

(2) 1992 through 2019 model diesel engines used in medium-duty low-emission vehicles, ultra-low-emission vehicles, and super-ultra-low-emission vehicles from 8,501 to 14,000 pounds GVWR, and 2020 through 2023 model diesel engines used in medium-duty ultra-low-emission vehicles, and super-ultra-low-emission vehicles from 10,001 to 14,000 pounds GVWR shall not exceed:

Exhaust Emission Standards for Engines Used in 1992 through 2004 Model Incomplete Otto-Cycle Medium-Duty Low-Emission Vehicles, Ultra-Low-Emission Vehicles, and Super Ultra-Low-Emission Vehicles, and 1992 through 2023 Model Diesel Engines Used in Medium-Duty Low-Emission Vehicles, Ultra-Low-Emission Vehicles, and Super Ultra-Low-Emission Vehicles <sup>A, F</sup> (grams per brake horsepower-hour)							
Model Year	Vehicle Emissions	Carbon Monoxide	NMHC + NO <sub>x</sub> <sup>C</sup>	Non-Methane Hydrocarbons	Oxides of Nitrogen	Formaldehyde	Particulates <sup>D</sup>



	<b>Category B</b>						
1992 E - 2001	LEV	14.4	3.5 K	n/a	n/a	0.050	0.10 K
2002-2003 E	LEV	14.4	3.0 K	n/a	n/a	0.050	0.10 K
1992-2003 E, H	ULEV	14.4	2.5 K	n/a	n/a	0.050	0.10 K
2004-2006 L	ULEV - Opt A	14.4	2.5 I, J, K	n/a	n/a	0.050	0.10 J, K
2004-2006 L	ULEV - Opt. Bn/a	14.4	2.4 I, J, K	n/a	n/a	0.050	0.10 J, K
2007-2023 D (diesel only)	ULEV	15.5	n/a	0.14	0.20	0.050	0.01
1992-2006 L	SULEV	7.2	2.0 K	n/a	n/a	0.025	0.05 K
2007-2023 D (diesel only)	SULEV	7.7	n/a	0.07	0.10	0.025	0.005

<sup>A</sup> This set of standards is optional. For the 1992 through 2019 model years, manufacturers of engines used in incomplete medium-duty vehicles or diesel engines used in medium-duty vehicles from 8501-10,000 pounds gross vehicle weight rating may choose to comply with these standards as a alternative to the primary emission standards and test procedures specified in section 1960.1, section 1961, or section 1961.2, Title 13, California Code of Regulations. For the 1992 through 2023 model years, manufacturers of engines used in incomplete medium-duty vehicles or diesel engines used in medium-duty vehicles from 10,001-14,000 pounds gross vehicle weight rating may choose to comply with these standards as an alternative to the primary emission standards and test procedures specified in section 1960.1, section 1961, or section 1961.2, Title 13, California Code of Regulations. For the 2020 and subsequent model years, both incomplete medium-duty vehicles and medium-duty vehicles that use a diesel engine 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. Manufacturers that choose to comply with these optional heavy-duty standards and test procedures shall specify, in the application for certification, an in-use compliance test procedure, as provided in section 2139(c), Title 13, California Code of Regulations.

<sup>B</sup> "LEV" means low-emission vehicle.

"ULEV" means ultra-low-emission vehicle.

"SULEV" means super ultra-low-emission vehicle.

<sup>C</sup> This standard is the sum of the individual non-methane hydrocarbon emissions and oxides of nitrogen emissions. For methanol-fueled engines, non-methane hydrocarbons shall mean organic material hydrocarbon equivalent ("OMHCE").

<sup>D</sup> These standards apply only to diesel engines and vehicles.

<sup>E</sup> Manufacturers may certify engines used in incomplete medium-duty vehicles or diesel engines used in medium-duty vehicles to these standards to meet the requirements of section 1956.8 (g), Title 13, California Code of Regulations.

<sup>F</sup> In-use compliance testing shall be limited to vehicles or engines with fewer than 90,000 miles.

<sup>G</sup> [Reserved]

<sup>H</sup> For engines certified to the 3.5 grams per brake horsepower-hour (g/bhp-hr) LEV standards, the in-use compliance standard shall be 3.7 g/bhp-hr for the first two model years of introduction. For engines certified to the 2002 and 2003 model year LEV standards, the in-use compliance standard shall be 3.2 g/bhp-hr. For engines certified to the 1992 through 2003 model year ULEV standards, the in-use compliance standard shall be 2.7 g/bhp-hr for the first two model years of introduction. For engines certified to the 1992 through 2023 SULEV standards, the in-use compliance standard shall be 2.2 g/bhp-hr for the first two model years of introduction.

<sup>I</sup> Manufacturers have the option of certifying to either option A or B. Manufacturers electing to certify to Option A must demonstrate that the NMHC emissions do not exceed 0.5 g/bhp-hr.

<sup>J</sup> Emissions averaging may be used to meet these standards for diesel engines, using the requirements for participation in averaging, banking and trading programs, as set forth in the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," incorporated by reference in section 1956.8(b), above.

<sup>K</sup> Engines of 1998 through 2023 model years may be eligible to generate averaging, banking and trading credits based on these standards according to the requirements of the averaging, banking and trading programs described in the “California Exhaust Emission Standards and Test Procedures for 1985 through 2003 Model Heavy-Duty Diesel Engines and Vehicles” and the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles,” incorporated by reference in section 1956.8(b), above.

<sup>L</sup> For the 2005 and 2006 model years, these emission standards only apply to diesel engines and vehicles.

(3) 2007 and later model year engines subject to (h)(2) have the following Phase-in Options.

(A) Early NOx compliant engines. For model years 2007, 2008, and 2009, a manufacturer may, at their option, certify one or more of their engine families to the combined NOx plus NMHC standard or FEL applicable to model year 2006 engines under section 1956.8(h)(2), in lieu of the separate NOx and NMHC standards or FELs applicable to the 2007 through 2032 model years, specified in section 1956.8(h)(2). Each engine certified under this phase-in option must comply with all other emission requirements applicable to model year 2007 engines. To qualify for this option, a manufacturer must satisfy the U.S.-directed production requirement of certifying no more than 50 percent of engines to the NOx plus NMHC standards or FELs applicable to 2006 engines, as specified in 40 Code of Federal Regulations, part 86, section 86.007-11(g)(1), as adopted January 18, 2001. In addition, a manufacturer may reduce the quantity of engines that are required to be phased-in using the early certification credit program specified in 40 Code of Federal Regulations, part 86, section 86.007-11(g)(2), as adopted January 18, 2001, and the “Blue Sky” engine program specified in 40 Code of Federal Regulations, part 86, section 86.007-11(g)(4), as adopted January 18, 2001.

(B) Early PM compliant engines. A manufacturer certifying engines to the 2007 through 2023 model year PM standard listed in section 1956.8 (h)(2) (without using credits, as determined in any averaging, banking, or trading program described in “California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles,” to comply with the standards) before model year 2007 may reduce the number of engines that are required to meet the 2007 through 2023 model year PM standard listed in section 1956.8(h)(2) in model year 2007, 2008 and/or 2009. To qualify for this option, a manufacturer must satisfy the PM emission requirements pursuant to the methods detailed in 40 Code of Federal Regulations, part 86, section 86.007-11(g)(2)(ii), as adopted January 18, 2001.

(4) No crankcase emissions shall be discharged directly into the ambient atmosphere from any new 2007 or later model year diesel heavy-duty diesel engine, with the following exception: heavy-duty diesel engines equipped with turbochargers, pumps, blowers, or superchargers for air induction may discharge crankcase emissions to the ambient atmosphere if the emissions are added to the exhaust emissions (either physically or mathematically) during all emission testing. Manufacturers taking advantage of this exception must manufacture the engines so that all crank-case emission can be routed into a dilution tunnel (or other sampling system approved in advance by the Executive Officer), and must account for deterioration in crankcase emissions when determining exhaust deterioration factors. For the purpose of section 1956.8(h)(2), crankcase emissions that are routed to the exhaust upstream of exhaust aftertreatment during all operation are not considered to be “discharged directly into the ambient atmosphere.”

(5) *Optional Standards for 2023 and Earlier Model Complete and Incomplete Heavy-Duty Vehicles that Use Heavy-Duty Diesel Engines.* For 2023 and earlier model years only, manufacturers may request to group complete and incomplete heavy-duty diesel vehicles into the same test group as medium-duty diesel vehicles certifying to the LEV III exhaust emission standards and test procedures specified in title 13, CCR, section 1961.2, so long as those complete and incomplete heavy-duty diesel vehicles meet the most stringent LEV III standards to which any vehicle within that test group certifies.

(6) Greenhouse Gas Emission Standards for New 2014 and Subsequent Model Heavy-Duty Diesel Engines and 2016 and Subsequent Heavy-Duty Otto-Cycle Engines Used in Medium-Duty Low-Emission Vehicles, Ultra-Low-Emission Vehicles, and Super-Ultra-Low-Emission Vehicles.

(A) The CO<sub>2</sub> emissions from new 2014 and subsequent model heavy-duty diesel engines and new 2016 and subsequent heavy-duty Otto-cycle engines used in medium-duty low-emission vehicles, ultra-low-emission vehicles, and super-ultra-low-emission vehicles shall not exceed:

**CO<sub>2</sub> Emission Standards for 2014 and Subsequent Model Heavy-Duty Diesel Engines and 2016 and Subsequent Model Heavy-Duty Otto-Cycle Engines Used in Medium-Duty Low-Emission Vehicles, Ultra-Low-Emission Vehicles, and Super-Ultra-Low Emission Vehicles <sup>A</sup>, <sup>B</sup> (in g/hp-hr)**

<b>Model Years</b>	<b>Diesel Engines <sup>C</sup></b>	<b>Otto-Cycle Engines</b>
2014	600	-
2015	600	-
2016	600	627
2017-2020	576	627
2021-2023	563	627
2024-2026	555	627

2027 and later	552	627

**A Family Certification Levels.** An FCL must be specified for each engine family, which may not be less than the certified emission level for the engine family. The FEL for the engine family is equal to the FCL multiplied by 1.03. The FCL serves as the CO<sub>2</sub> emission standard for the engine family with respect to certification and confirmatory testing instead of the standards specified in this subsection (h)(6)(A). The FEL serves as the emission standard for the engine family with respect to all other testing.

**B Averaging, Banking, and Trading Program and Credits.** The requirements for the optional averaging, banking, and trading program and for generating credits are described in the applicable test procedures incorporated by reference in subsection (b).

**C Alternate Emission Standards Based on 2011 Model Year Engines.** For model years 2014 through 2016, heavy-duty diesel engines may be certified to these alternate emission standards if they are not part of an averaging set in which a balance of banked credits remain. These alternate standards are determined from the measured emission rate of the test engine of the applicable baseline 2011 engine family(ies) as described in the California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles, as incorporated by reference in section (b). The alternate CO<sub>2</sub> standard for light heavy-duty vocational-certified engines is equal to the baseline 2011 emission rate multiplied by 0.975.

(7) The exhaust emissions from new 2024 and subsequent model diesel engines used in medium-duty vehicles from 10,001 - 14,000 pounds GVWR, shall not exceed:

Exhaust Emission Standards for 2024 through 2026 Model Diesel Engines Used in Medium-Duty Vehicles from 10,001 - 14,000 pounds GVWR (g/bhp-hr) <sup>A</sup>					
Test Procedure	Oxides of Nitrogen	Non-methane Hydrocarbons	Carbon Monoxide	Particulates	Formaldehyde
FTP cycle	0.050	0.14	15.5	0.005	0.050
RMC cycle	0.050	0.14	15.5	0.005	0.050
Low-load cycle	0.200	0.14	15.5	0.005	0.050

Exhaust Emission Standards for 2027 and Subsequent Model Diesel Engines Used in Medium-Duty Vehicles from 10,001 - 14,000 pounds GVWR (g/bhp-hr) <sup>A</sup>					
Test Procedure	Oxides of Nitrogen	Non-methane Hydrocarbons	Carbon Monoxide	Particulates	Formaldehyde
FTP cycle	0.020	0.14	15.5	0.005	0.050
RMC cycle	0.020	0.14	15.5	0.005	0.050
Low-load cycle	0.050	0.14	15.5	0.005	0.050

<sup>A</sup> A manufacturers of diesel engines used in medium-duty vehicles from 10,001-14,000 pounds gross vehicle weight rating may choose to comply with these standards as an alternative to the primary emission standards and test procedures specified in section 1961.2, title 13, CCR. A manufacturer that chooses to comply with these optional heavy-duty engine standards and test procedures shall specify, in the Part I application for certification, an in-use compliance test procedure, as provided in section 2139(c), title 13, CCR. An engine certified for use in a medium-duty vehicle shall not be used in a heavy-duty vehicle over 14,000 pounds GVWR.

(i) **Severability:** If any provision of this section is held to be invalid or unenforceable by any court of competent jurisdiction, such invalidity shall not affect any provision of this section that can be effected without the invalid provision.

(j) **Definitions Specific to this Section.** The following definitions apply to this section 1956.8.

(1) "Active Bus" has the same meaning as defined in 13 CCR § 2023(b)(1).

(2) "Bus" has the same meaning as defined in 13 CCR § 2023(b)(6).

(3) "Bus purchase" or "Purchase" has the same meaning as defined in 13 CCR § 2023(b)(7).

(4) "Certified emission level" means the highest deteriorated emission level in an engine family for a given pollutant from the applicable transient and/or steady-state testing, rounded to the same number of decimal places as the applicable standard. Note that there may be two certified emission levels for CO<sub>2</sub> if a family is certified for both vocational and tractor use.

(5) "Exempt bus" refers to a bus that is equipped with a 2022 and subsequent model year diesel-fueled heavy-duty engine that is certified to both the federal emission standards for 2010 and later model year diesel heavy-duty engines and vehicles as set forth in title 40, Code of Federal Regulations, section 86.007-11, as last amended Oct. 25, 2016, and the federal Greenhouse Gas Emissions and Fuel Economy Standards for Medium- and Heavy-Duty Engines and Vehicles - Phase 2 requirements promulgated at 81 Fed. Reg. 73,478 (October 25, 2016), which are incorporated by reference herein.

(6) "Family certification level" (FCL) means a CO<sub>2</sub> emission level declared by the manufacturer that is at or above emission test results for all emission-data engines. The FCL serves as the emission standard for the engine family with respect to certification testing if it is different than the otherwise applicable standard. The FCL must be expressed to the same number of decimal places as the emission standard it replaces.

(B) The CH<sub>4</sub> emissions from new 2014 and subsequent model heavy-duty diesel engines and new 2016 and subsequent heavy-duty Otto-cycle engines used in medium-duty low-emission vehicles, ultra-low-emission vehicles, and super-ultra-low-emission vehicles shall not exceed 0.10 g/hp-hr.

(C) The N<sub>2</sub>O emissions from new 2014 and subsequent model heavy-duty diesel engines and new 2016 and subsequent heavy-duty Otto-cycle engines used in medium-duty low-emission vehicles, ultra-low-emission vehicles, and super-ultra-low-emission vehicles shall not exceed 0.10 g/hp-hr.

(7) "Family emission limit" (FEL) means an emission level declared by the manufacturer to serve in place of an otherwise applicable emission standard (other than CO<sub>2</sub> standards) under the Average, Banking, and Trading Program. The FEL must be expressed to the same number of decimal places as the emission standard it replaces. The FEL serves as the emission standard for the engine family with respect to all required testing except certification testing for CO<sub>2</sub>. The CO<sub>2</sub> FEL is equal to the CO<sub>2</sub> FCL multiplied by 1.03 and rounded to the same number of decimal places as the standard (e.g., the nearest whole g/hp-hr for the 2016 CO<sub>2</sub> standards).

(8) "Heavy-Duty Transient Federal Test Procedure" or "FTP cycle" means the test procedure specified in 40 CFR § 86.007-11(a)(2), as amended October 25, 2016, incorporated by reference herein, for heavy-duty diesel engines, and the test procedure specified in 40 CFR § 86.008-10(a)(2), as amended on October 25, 2016, incorporated by reference herein, for heavy-duty Otto-cycle engines.

(9) "Heavy heavy-duty engine" means an engine used in a vehicle that normally exceeds 33,000 pounds GVWR. Heavy heavy-duty engines are designed for multiple rebuilds and have cylinder liners. Vehicles in this group are normally tractors, trucks, straight trucks with dual rear axles, and buses used in inter-city, long-haul applications. Otto-cycle engines that are best characterized by this definition share a primary intended service class with diesel heavy heavy-duty engines. However, gasoline-fueled engines are presumed not to be characterized by this definition; for example, vehicle manufacturers may install some number of gasoline-fueled engines in vehicles with a GVWR that is above 33,000 pounds without causing the engine manufacturer to consider those to be heavy heavy-duty engines.

(10) "Hybrid powertrain or optionally certified hybrid powertrain" means a group of components that includes an engine, electric motor-generator system, rechargeable energy storage system other than a conventional battery system or conventional flywheel, battery management system, including charge controller and thermal management systems and associated power electronics. Transmissions, final drives, and drive shafts may be included as powertrain components if specified by the hybrid powertrain manufacturer. Supplemental electrical batteries and hydraulic accumulators are examples of hybrid energy storage systems. Note other examples of systems that qualify as hybrid engines or power-trains are systems that recover kinetic energy and use it to power an electric heater in the aftertreatment.

(11) "Intermediate useful life" means the period of use of 435,000 miles or eight years or 22,000 hours, whichever first occurs, applicable for the intermediate emission standards for oxides of nitrogen for 2027 and subsequent model year heavy heavy-duty diesel engines.

(12) "Intermediate useful life NOx standard" means the emissions standards for oxides of nitrogen applicable to the intermediate useful life for 2027 and subsequent model year heavy heavy-duty diesel engines.

(13) "Legacy engine family" means an engine family certified under the provisions of title 13, CCR, section 1956.8(a)(2)(C)3.

(14) "Light heavy-duty engine" means an engine used in a vehicle that is normally at or below 19,500 pounds GVWR. Light heavy-duty engines usually are not designed for rebuild and do not have cylinder liners. Vehicle body types in this group might include any heavy-duty vehicle built for a light-duty truck chassis, van trucks, multi-stop vans, and some straight trucks with a single rear axle. Typical applications would include personal transportation, light-load commercial delivery, passenger service, agriculture, and construction.

(15) "Low-load cycle" means the emission test procedure with the low-load cycle according to section I.11.B.8 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," incorporated by reference in subsection (b).

(16) "Medium heavy-duty engine" mean an engine used in a vehicle that is normally between 19,501 to 33,000 pounds GVWR. Medium heavy-duty engines may be designed for rebuild and may have cylinder liners. Vehicle body types in this group would typically include school buses, straight trucks with single rear axles, city tractors, and a variety of special purpose vehicles such

as small dump trucks, and refuse trucks. Typical applications would include commercial short haul and intra-city delivery and pickup.

(17) "NOx exempt areas" has the same meaning as defined in 13 CCR § 2023(b)(39).

(18) "Primary intended service class" means the class that best describes the vehicle for which the manufacturer designs and markets the engine. The three primary intended service classes are light heavy-duty, medium heavy-duty, and heavy heavy-duty.

(19) "Ramped Modal Cycle" or "RMC cycle" means the supplemental emission test procedure with the steady-state cycle in 40 CFR § 86.1360, as amended October 25, 2016, incorporated by reference herein.

(20) "Tractor" means a vehicle meeting the definition of "tractor" in 40 CFR § 1037.801, as amended October 25, 2016, incorporated by reference herein, but not classified as a "vocational tractor" under 40 CFR § 1037.630, as amended October 25, 2016, incorporated by reference herein, or relating to such a vehicle.

(21) "Tractor engine" means an engine certified for use in tractors. Where an engine family is certified for use in both tractors and vocational vehicles, "tractor engine" means an engine that the engine manufacturer reasonably believes will be (or has been) installed in a tractor. Note that the Executive Officer may require a manufacturer to document how it determines that an engine is a tractor engine.

(22) "Test Procedure" means all aspects of engine testing including, but not limited to, the cycle, preconditioning procedures, equipment specifications, calibrations, calculations, and other protocols and specifications needed to measure emissions.

(23) "Transit Agency" has the same meaning as defined in 13 CCR § 2023(b)(51).

(24) "Urban Bus" has the same meaning as defined in 40 CFR § 86.091-2, as amended July 26, 1990, incorporated by reference herein.

(25) "Vocational engine" means an engine certified for use in vocational vehicles. Where an engine family is certified for use in both tractors and vocational vehicles, "vocational engine" means an engine that the engine manufacturer reasonably believes will be (or has been) installed in a vocational vehicle. Note that the provisions of this part may require a manufacturer to document how it determines that an engine is a vocational engine.

(26) "Vocational vehicle" means a vehicle meeting the definition of "vocational" vehicle in 40 CFR § 1037.801, as amended October 25, 2016, incorporated by reference herein.

(27) "Zero-emission powertrain" means an all-electric or hydrogen fuel-cell powertrain assembly, which includes (if applicable) the electric traction motor, system controller, generator, on-board charger, battery management system, thermal management systems, energy storage system (batteries, capacitors, and flywheels), inverter, fuel-cell stack, and the interface at which electrical power is converted to tractive mechanical power or vice-versa (in the case of a regenerative braking system), certified pursuant to the requirements in subsection (a)(8).

## Credits

NOTE: Authority cited: Sections 38501, 38505, 38510, 38560, 38580, 39500, 39600, 39601, 40000, 43013, 43018, 43100, 43101, 43102, 43104, 43105, 43106 and 43806, Health and Safety Code; and Section 28114, Vehicle Code. Reference: Sections 38501, 38505, 38510, 38560, 38580, 39002, 39003, 39010, 39017, 39033, 39500, 39600, 39601, 39610, 39650, 39657, 39667, 39701, 40000, 43000, 43000.5, 43009, 43009.5, 43013, 43017, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43202, 43204, 43205, 43205.5, 43206, 43210, 43211, 43212, 43213 and 43806, Health and Safety Code; and Section 28114, Vehicle Code.

## HISTORY

1. New section filed 5-15-85; effective thirtieth day thereafter (Register 85, No. 20).
2. Amendment of subsections (a) and (b) filed 9-15-86; effective thirtieth day thereafter (Register 86, No. 38).
3. Relettering and amendment of former subsection (c) to (e), relettering of former subsection (d) to (f) and new subsections (c) and (d) filed 9-15-86; effective thirtieth day thereafter (Register 86, No. 38).
4. Editorial correction of subsection (a) printing error (Register 87, No. 50).
5. Amendment of subsection (d) filed 6-6-88; operative 6-6-88 pursuant to Government Code section 11346.2(d) (Register 88, No. 25).
6. Amendment filed 2-21-90; operative 3-23-90 (Register 90, No. 8).
7. Amendment filed 6-14-90; effective 7-14-90 (Register 90, No. 33).
8. Amendment of subsections (b), (c), (d) and (g) filed 8-2-91; operative 9-2-91 (Register 91, No. 49).
9. Amendment of subsections (a), (b), (d) and (g) and new subsection (h) filed 8-30-91; operative 9-30-91 (Register 92, No. 14).
10. Amendment of subsections (b) and (d) filed 12-9-92; operative 1-1-93 (Register 92, No. 50).

11. Amendment of subsection (d) filed 7-20-93; operative 8-19-93 (Register 93, No. 30).
12. Amendment of subsection (b) filed 12-1-93; operative 1-1-95 (Register 93, No. 49).
13. Amendment of (a)(1) table and notes, subsection (b) and NOTE filed 5-12-94; operative 6-13-94 (Register 94, No. 19).
14. Amendment of subsections (b) and (d) filed 4-13-95; operative 4-13-95 pursuant to Government Code section 11343.4(d) (Register 95, No. 15).
15. Amendment of subsections (a)(1), (b), (c)(1) and (d) filed 12-14-95; operative 1-13-96 (Register 95, No. 50).
16. Amendment filed 9-23-96; operative 10-23-96 (Register 96, No. 39).
17. Amendment of subsection (b) filed 7-25-97; operative 8-24-97 (Register 97, No. 30).
18. Amendment filed 4-15-99; operative 5-15-99 (Register 99, No. 16).
19. Amendment filed 1-23-2001; operative 1-23-2001 pursuant to Government Code section 11343.4(c) (Register 2001, No. 4).
20. Amendment of section and NOTE filed 4-30-2001; operative 5-30-2001 (Register 2001, No. 18).
21. Amendment of subsection (b) filed 7-25-2001; operative 7-25-2001 pursuant to Government Code section 11343.4 (Register 2001, No. 30).
22. Redesignation and amendment of subsection (a)(2) as subsection (a)(2)(A), new subsections (a)(2)(B) and (a)(5), amendment of subsections (b) and (h), new subsections (h)(3)-(4) and amendment of NOTE filed 10-18-2002; operative 11-17-2002 (Register 2002, No. 42).
23. Change without regulatory effect amending subsections (a)(2)(B)(i)-(ii) and (h)(3) filed 4-16-2003 pursuant to section 100, title 1, California Code of Regulations (Register 2003, No. 16).
24. Amendment of section and NOTE filed 10-16-2003; operative 11-15-2003 (Register 2003, No. 42).
25. Amendment of subsections (b), (c)(1)(B), (d) and (h)(2) footnotes J-K filed 11-4-2003; operative 12-4-2003 (Register 2003, No. 45).
26. Amendment of subsection (a)(2)(A) table heading and table, new table footnotes L and M and redesignation of former subsections (a)(2)(B)(i)-(ii) as subsections (a)(2)(B)1.-2. filed 9-7-2006; operative 10-7-2006 (Register 2006, No. 36).
27. New subsections (a)(6)-(a)(6)(D), amendment of subsection (b) and amendment of NOTE filed 10-16-2006; operative 11-15-2006 (Register 2006, No. 42).
28. Amendment of subsections (a)(2)(A), (b), (d) and (h)(2) filed 9-11-2007; operative 10-11-2007 (Register 2007, No. 37).
29. Amendment of subsections (b) and (d) and amendment of NOTE filed 12-5-2007; operative 1-4-2008 (Register 2007, No. 49).
30. Amendment of subsection (b) filed 12-1-2008; operative 12-31-2008 (Register 2008, No. 49).
31. Amendment of subsection (a)(6)(B) filed 12-3-2009; operative 12-3-2009 pursuant to Government Code section 11343.4(c) (Register 2009, No. 49).
32. Amendment of subsections (b) and (d) and amendment of NOTE filed 11-8-2010; operative 12-8-2010 (Register 2010, No. 46).
33. Amendment of subsection (b) filed 11-22-2011; operative 12-22-2011 (Register 2011, No. 47).
34. Amendment of subsections (b) and (c)(1)(B), new subsection (c)(3), amendment of subsections (d) and (h)(2), new subsection (h)(5) and amendment of NOTE filed 8-7-2012; operative 8-7-2012 pursuant to Government Code section 11343.4 (Register 2012, No. 32).
35. Amendment of subsections (b), (c)(3), (d) and (h)(5) filed 12-31-2012; operative 12-31-2012 pursuant to Government Code section 11343.4 (Register 2013, No. 1).
36. Change without regulatory effect amending the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" and the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines" (incorporated by reference) and amending subsections (b) and (d) filed 4-18-2013 pursuant to section 100, title 1, California Code of Regulations (Register 2013, No. 16).
37. Amendment of subsection (a)(2)(A), new subsections (a)(7)-(a)(7)(C), amendment of subsections (b) and (c)(1)(B), new subsections (c)(4)-(c)(4)(C), amendment of subsection (d), new subsections (h)(6)-(i)(14) and amendment of NOTE filed 12-5-2014; operative 12-5-2014 pursuant to Government Code section 11343.4(b)(3) (Register 2014, No. 49).
38. Editorial correction of HISTORY 37 (Register 2014, No. 50).

39. Amendment of subsections (b) and (d) and amendment of NOTE filed 10-8-2015; operative 10-8-2015 pursuant to Government Code section 11343.4(b)(3) (Register 2015, No. 41).

40. Repealer of subsections (i)(2)-(4), subsection renumbering and amendment of NOTE filed 7-25-2016; operative 7-25-2016 pursuant to Government Code section 11343.4(b)(3) (Register 2016, No. 31).

41. Amendment of subsections (a)(7)(A) and (b), new subsection (c)(4)(A)1. and amendment of subsection (d) filed 10-16-2017; operative 10-16-2017 pursuant to Government Code section 11343.4(b)(3) (Register 2017, No. 42).

42. Amendment of subsections (a)(7)(A), (b) and (c)(4)(A), new subsection (c)(4)(A)1., subsection renumbering, new subsection (c)(4)(A)3., amendment of subsections (d), (h)(6)(A), (i)(4)-(6), (i)(8) and (i)(11) and amendment of NOTE filed 2-7-2019; operative 4-1-2019 (Register 2019, No. 6).

43. Amendment of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles" (incorporated by reference) and amendment of subsection (b) filed 6-12-2019; operative 10-1-2019 (Register 2019, No. 24).

44. Amendment of section heading and new subsections (a)(8) and (i)(12) filed 1-21-2020; operative 4-1-2020 (Register 2020, No. 4).

45. Amendment filed 12-22-2021; operative 4-1-2022 (Register 2021, No. 52). Transmission deadline specified in Government Code section 11346.4(b) extended 60 calendar days pursuant to Executive Order N-40-20. Filing deadline specified in Government Code section 11349.3(a) extended 60 calendar days pursuant to Executive Order N-40-20 and an additional 60 calendar days pursuant to Executive Order N-71-20.

This database is current through 1/12/24 Register 2024, No. 2.

Cal. Admin. Code tit. 13, § 1956.8, 13 CA ADC § 1956.8

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