PART 7

FINAL REGULATION ORDER TEST PROCEDURES

Part I – D (Part 1039)

(2011 and Later Model Years)

Tier 4 Off-Road Compression-Ignition Engines

This Page Left Intentionally Blank

FINAL REGULATION ORDER TEST PROCEDURES

Note: This appendix shows the entirety of regulatory amendments to the test procedures titled below, which were approved by the Air Resources Board on December 16, 2011, and refined via subsequent conforming modifications authorized under Resolution 11-41. The source for these test procedures is Part 1039 of the "California Exhaust Emission Standards and Test Procedures for New 2008 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-C" (Part I-C), adopted October 20, 2005. Part 1068 and Part 1065 of those test procedures have been updated in separate documents titled "California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression Ignition Engines, Part I-E" (Part I-E), and "California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression Ignition Engines, Part I-F" (Part I-F), respectively. The proposed modifications to this document are, in large part, incorporated directly or by reference from 40 Code of Federal Regulations (CFR) part 1039, subparts A, B, C, D, E, F, G, H, and I, including Appendix I, II, V, and VI to part 1039, last amended June 28, 2011, and the subparts of 40 CFR Part 60, 40 CFR Part 85, 40 CFR Part 86, 40 CFR Part 89, 40 CFR Part 92, and 40 CFR Part 1033 that are internally referenced within 40 CFR Part 1039. These test procedures are incorporated by reference in Title 13, California Code of Regulations, Section 2421(a)(4)(B). These amendments are formatted in a style to indicate changes from the existing test procedures. All existing language is indicated by plain type. All additions to the existing language are indicated by <u>underlined</u> type (except that some existing headings within the test procedures were underlined originally for emphasis, and remain so, and thus do not constitute new language). All deletions to the existing language are indicated by ~~strikeout~~. Additionally, to facilitate lengthy and extensive revisions of the existing text, the terms "DELETE" and "REPLACE WITH" or "ADD" are used to denote changes from the existing test procedures and do not generally indicate the incorporation of federal provisions as this convention is normally used. Only those sections containing the modifications from the existing language are included. All other portions remain unchanged and are indicated by the notation [* * * * *] for reference. If there is any conflict between the provisions of this document and the California Health and Safety Code, Division 26, or Title 13 of the California Code of Regulations (CCR), the Health and Safety Code and Title 13 apply.

This Page Left Intentionally Blank

State of California

AIR RESOURCES BOARD

California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression-Ignition Engines

PART I-~~C~~D

Adopted: October 20, 2005

Amended: October 25, 2012

Table of Contents

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR NEW 20~~08~~11 AND LATER TIER 4 OFF-ROAD COMPRESSION-IGNITION ENGINES, Part I-D

The following provisions of Part 1039~~, Part 1065, and Part 1068~~, Title 40, Code of Federal Regulations (CFR), as ~~proposed~~ promulgated and last amended by the United States Environmental Protection Agency on ~~the date listed~~ June 28, 2011, are ~~adopted and~~ incorporated herein by this reference into the existing California test procedures for 2008 model year and later off-road compression-ignition engines, hereafter known as the "California Exhaust Emission Standards and Test Procedures for New 20~~08~~11 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-D," except as altered or replaced by the provisions set forth below. All proposed changes indicated by the notation " * * * * * " or by ~~strikeout~~/underline refer to the existing 2008 and Later California Test Procedures, Part I-C, as previously adopted by the Air Resources Board on October 20, 2005. References to other 40 CFR parts and sections refer to parts and sections incorporated in this or other ARB Test Procedures unless otherwise indicated.

PART 1039 – CONTROL OF EMISSIONS FROM NEW AND IN-USE OFF-ROAD COMPRESSION-IGNITION ENGINES

SOURCE: California Exhaust Emission Standards and Test Procedures for New 2008 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-C, Adopted October 20, 2005, predicated upon the requirements of 69 FR 38957, June 29, 2004, amended July 13, 2005, unless otherwise noted.

Subpart A – Overview and Applicability

§ 1039.1 Does this part apply for my engines?

* * * * *

(c) DELETE,
REPLACE WITH:
(c) The definitions of "off-road compression-ignition engine" in 13 CCR 2421(a)(38) and 40 CFR 1068.30 exclude certain engines used in stationary applications. These engines may be required by 17 CCR 93115 or subpart IIII of 40 CFR part 60 to comply with some of the provisions of this part 1039; otherwise, these engines are ~~not~~ only required to comply with ~~this part, except for~~ the requirements in §1039.20. In addition~~, if these engines are uncertified~~, the prohibitions in §1068.101 restrict ~~their use as~~ the use of stationary engines for nonstationary purposes unless they are certified under §1039, or under the provisions referenced in 13 CCR 2421(a)(3), or 40 CFR part 94, to the same standards that would apply to off-road compression-ignition engines for the same model year.

ADD:
§ 1039.2 Who is responsible for compliance?
The regulations in this part 1039 contain provisions that may affect engine or equipment manufacturers, or both, and others. However, the requirements of this part are generally addressed to the engine manufacturer. The term "you" generally means the engine manufacturer, as defined in §1039.801, especially for issues related to certification.

§ 1039.5 Which engines are excluded from this part's requirements?
DELETE,
REPLACE WITH:
This part does not apply to the following off-road engines:

(a) Locomotive engines.

(1) The following locomotive engines are not subject to the provisions of this part 1039:

(i) Engines in locomotives ~~subject to the standards of~~ certified under 40 CFR part ~~92~~ 1033.

(ii) Engines in locomotives that are exempt from the standards of 40 CFR part 92 or 1033 pursuant to the provisions of 40 CFR part 1033 (except for the provisions of 40 CFR 1033.150(e) or to §1068. ~~(except for the provisions of 40 CFR 92.907). For example, an engine that is exempt under 40 CFR 92.906 because it is in a manufacturer-owned locomotive is not subject to the provisions of this part 1039. 1033.150(e)).~~

(2) The following locomotive engines are subject to the provisions of this part 1039:

(i) Engines in locomotives exempt from 40 CFR part ~~92~~ 1033 pursuant to the provisions of 40 CFR ~~92.907~~ 1033.150(e).

(ii) Locomotive engines excluded from the definition of locomotive in 40 CFR ~~92.2~~ 1033.901.

(b) Marine engines. (1) The following marine engines are not subject to the provisions of this part 1039 or 13 CCR 2423:

(i) Engines subject to the standards of 40 CFR part 94.

(ii) Engines not subject to the standards of 40 CFR part 94 only because they were produced before the standards of 40 CFR part 94 started to apply.

(iii) Engines otherwise subject to the standards of 40 CFR Part 94 but that are exempt from the standards of 40 CFR part 94 pursuant to the provisions of 40 CFR part 94

(except for the provisions of 40 CFR 94.907 or 94.912). For example, an engine that is exempt under 40 CFR 94.906 because it is a manufacturer-owned engine is not subject to the provisions of this part 1039.

(iv) Engines with rated power below 37 kW, except that such engines must continue to meet Tier 2 standards and other requirements as stated in the 2000 Plus Limited Test Procedures .

(v) Engines on foreign vessels.

(2) Marine engines are subject to the provisions of this part 1039 if they are otherwise subject to the standards of 40 CFR Part 94 but are exempted from 40 CFR part 94 based on the engine-dressing provisions of 40 CFR 94.907 or the common-family provisions of 40 CFR 94.912.

(c) Mining engines. Engines used in underground mining or in underground mining equipment and regulated by the Mining Safety and Health Administration in 30 CFR parts 7, 31, 32, 36, 56, 57, 70, and 75 are not subject to the provisions of this part 1039.

(d) Hobby engines. Engines ~~with per-cylinder displacement below 50 cubic centimeters~~ installed in reduced-scale models of vehicles that are not capable of transporting a person are not subject to the provisions of this part 1039.

(e) Engines used in recreational vehicles. Engines certified to meet the requirements of 13 CCR Chapter 9 Article 3 or otherwise subject to 13 CCR Chapter 9 Article 3 (for example, engines used in snowmobiles and all-terrain vehicles) are not subject to the provisions of this part 1039.

§ 1039.10 How is this part organized?

(Introduction) DELETE:
~~The regulations in this part 1039 contain provisions that may affect engine or equipment manufacturers, or both, and others. However, the requirements of this part are generally addressed to the engine manufacturer. The term "you" generally means the engine manufacturer, as defined in § 1039.801.~~

* * * * *

§ 1039.15 Do any other regulation parts apply to me?
(a) DELETE,
REPLACE WITH:
(a) Part 1065 of this chapter describes procedures and equipment specifications for testing engines to measure exhaust emissions. Subpart F of this part 1039 describes how to apply the provisions of part 1065 of this chapter to determine whether engines meet the exhaust emission standards in this part.

* * * * *

§ 1039.20 What requirements from this part apply to excluded stationary engines?
DELETE,
REPLACE WITH:
The provisions of this section apply for engines built on or after January 1, 2006.

(a) You must add a permanent label or tag to each new engine you produce or import that is excluded under §1039.1(c) as a stationary engine and is not required by 17 CCR 93115 or CFR 40 part 60, subpart IIII, to meet:
1) the requirements of this Part 1039 or Title 13, CCR, Chapter 9, Article 4, or
2) the requirements in 40 CFR part 94, that are equivalent to the requirements applicable to off-road or marine engines, respectively, for the same model year.

To meet labeling requirements, you must do the following things:

(1) Attach the label or tag in one piece so no one can remove it without destroying or defacing it.

(2) Secure it to a part of the engine needed for normal operation and not normally requiring replacement.

(3) Make sure it is durable and readable for the engine's entire life.

(4) Write it in English.

(5) Follow the requirements in §1039.135(g) regarding duplicate labels if the engine label is obscured in the final installation.

(b) Engine labels or tags required under this section must have the following information:

(1) Include the heading "EMISSION CONTROL INFORMATION"."

(2) Include your full corporate name and trademark. You may instead include the full corporate name and trademark of another company you choose to designate.

(3) State the engine displacement (in liters) and maximum engine power (or in the case of fire pumps, NFPA nameplate engine power).

(4) State: "THIS ENGINE IS ~~EXCLUDED~~ EXEMPTED FROM THE REQUIREMENTS OF 13 CCR, CH 9, ARTICLE 4, AS A "STATIONARY ENGINE." INSTALLING OR USING THIS ENGINE IN ANY OTHER APPLICATION MAY BE A VIOLATION OF CALIFORNIA LAW SUBJECT TO CIVIL PENALTY." The referencing of similar federal requirements in combination with California references is permitted.

(c) Stationary engines required by 17 CCR 93115 or 40 CFR part 60, subpart IIII, to meet the requirements of this part 1039, or the requirements referenced at 13 CCR 2421(a)(3), or in 40 CFR part 94, must meet the labeling requirements of 40 CFR 60.4210.

ADD:
§1039.30 Submission of information.
(a) This part includes various requirements to record data or other information. Refer to §1039.825 and §1068.25 regarding recordkeeping requirements. Unless we specify otherwise, store these records in any format and on any media and keep them readily available for one year after you send an associated application for certification, or one year after you generate the data if they do not support an application for certification. You must promptly send us organized, written records in English if we ask for them. We may review them at any time.

(b) The regulations in §1039.255 and §1068.101 describe your obligation to report truthful and complete information and the consequences of failing to meet this obligation. This includes information not related to certification.

(c) Send all reports and requests for approval to the Executive Officer of the Air Resources Board (or the Executive Officer's designee as notified by ARB).

(d) Any written information we require you to send to or receive from another company is deemed to be a required record under this section. Such records are also deemed to be submissions to the Air Resources Board. We may require you to send us these records whether or not you are a certificate holder.

Subpart B – Emission Standards and Related Requirements

§ 1039.101 What exhaust emission standards must my engines meet after the 2014 model year?

* * * * *

§ 1039.102 What exhaust emission standards and phase-in allowances apply for my engines in model year 2014 and earlier?

* * * * *

(e) Alternate NOx standards. DELETE,
REPLACE WITH:
(e) Alternate NOx standards. For engines in 56-560 kW power categories during the phase-in of Tier 4 standards, you may certify engine families to the alternate NOx or NOx+NMHC standards in this paragraph (e) instead of the phase-in and phase-out NOx+NMHC standards described in Tables 4 through 6 of this section. Engines

certified to an alternate NOx standard under this section must be certified to an NMHC standard of 0.19 g/kW-hr. Do not include engine families certified under this paragraph (e) in determining whether you comply with the percentage phase-in requirements of paragraphs (c) and (d)(2) of this section. Except for the provisions for alternate FEL caps in §1039.104(g), the NOx and NOx+NMHC standards and FEL caps under this paragraph (e) are as follows:

* * * * *

ADD:
(e)(3) You may use NOx+NMHC emission credits to certify an engine family to the alternate NOx+NMHC standards in this paragraph (e)(3) instead of the otherwise applicable alternate NOx and NMHC standards. Calculate the alternate NOx+NMHC standard by adding 0.1 g/kW-hr to the numerical value of the applicable alternate NOx standard of paragraph (e)(1) or (2) of this section. Engines certified to the NOx+NMHC standards in Table 1b of 13 CCR 2423(b)(1)(A) using credits as permitted in~~of~~ this paragraph (e)(3) may not generate emission credits. The FEL caps for engine families certified under this paragraph (e)(3) are the previously applicable NOx+NMHC standards of 40 CFR 89.112 (generally the Tier 3 standards).

* * * * *

Table 8 Footnote [3] DELETE,
REPLACE WITH:
For manufacturers certifying engines to the standards of this part 1039 in 2012 under Option #2 of Table 3 of §1039.102, the FEL caps for 37-56 kW engines in the 19-56 kW category of Table 2 of §1039.101 apply for model year 2012 and later; see Title 13, CCR, §2423(b)(1)(A) for provisions that apply to earlier model years.

* * * * *

(g)(4) DELETE,
REPLACE WITH:
(g)(4) Special provisions for 37-56 kW engines. For engines at or above 37 kW and below 56 kW from model years 2008 through 2012, you must ~~take the following additional steps:~~

~~(i) State the applicable PM standard on the emission control information label.~~

~~(ii) A~~ add information to the emission-related installation instructions to clarify the equipment manufacturer's obligations under §1039.104(f).

§ 1039.104 Are there interim provisions that apply only for a limited time?

* * * * *

Table 1 of §1039.104 DELETE,
REPLACE WITH:

Table 1 of §1039.104 - Alternate FEL Caps				
Maximum Engine Power	PM FEL Cap, g/kW-hr	Model Years for the Alternate PM FEL Cap	NOx FEL Cap, g/kW-hr	Model Years for the Alternate NOx FEL Cap
19 ≤ kW < 56	0.30	2012-2015 [1]	-	-
56 ≤ kW < 130 [2]	0.30	2012-2015 [3]	3.8	~~2014~~2012-2015 [3]
130 ≤ kW ≤ 560	0.20	2011-2014	3.8	2011-2014 [4]
kW > 560 [45]	0.10	2015-2018	3.5	2015-2018

[1] For manufacturers certifying engines under Option #1 of Table 3 of §1039.102, these alternate FEL caps apply to all 19-56 kW engines for model years from 2013 through 2016 instead of in the years indicated in this table. For manufacturers certifying engines under Option #2 of Table 3 of §1039.102, these alternate FEL caps do not apply to 19-37 kW engines except in model years 2013 to 2015.

[2] For engines below 75 kW, the FEL caps are 0.40 g/kW-hr for PM emissions and 4.4 g/kW-hr for NOx emissions.

[3] For ~~engines certified under the provisions of §1039.102(d)(2) or (e)(1)(ii), the alternate NOx FEL cap in the table applies only for the 2015 model year~~ manufacturers certifying engines in this power category using a percentage phase-in/phase-out approach instead of the alternate NOx standards of §1039.102(e)(1), the alternate NOx FEL cap in the table applies only in the 2014-2015 model years if certifying under §1039.102(d)(1), and only in the 2015 model year if certifying under §1039.102(d)(2).

[4] For manufacturers certifying engines in this power category using the percentage phase-in/phase-out approach instead of the alternate NOx standard of §1039.102(e)(2), the alternate NOx FEL cap in the table applies only for the 2014 model year.

[45] For engines above 560 kW, the provision for alternate NOx FEL caps is limited to generator-set engines. For example, if you produce 1,000 generator-set engines above 560 kW in 2015, up to 200 of them may be certified to the alternate NOx FEL caps.

ADD:
(g)(5) You may certify engines under this paragraph (g) without regard to whether or not the engine family's FEL is at or below the otherwise applicable FEL cap. For example, a 200 kW engine certified to the NOx+NMHC standard of §1039.102(e)(3) with an FEL equal to the FEL cap of 2.8 g/kW-hr may be certified under this paragraph (g) and count toward the sales limit specified in paragraph (g)(1) of this section.

§ 1039.105 What smoke standards must my engines meet?

* * * * *

§ 1039.107 What evaporative emission standards and requirements apply?

* * * * *

§ 1039.110 [Reserved]

* * * * *

§ 1039.115 What other requirements ~~must my engines meet~~apply?
Introductory Text DELETE,
REPLACE WITH:
Engines ~~subject to this part~~ that are required to meet the emission standards of this part must meet the following requirements, except as noted elsewhere in this part:

Introductory Text (a) DELETE,
REPLACE WITH:

(a) Crankcase emissions. Crankcase emissions may not be discharged directly into the ambient atmosphere from any engine throughout its useful life, except as follows:

* * * * *

§ 1039.120 What emission-related warranty requirements apply to me?

* * * * *

(c) DELETE,
REPLACE WITH:
(c) Components covered. The emission-related warranty covers all components whose failure would increase an engine's emissions of any regulated pollutant, including~~. This includes~~ components listed in §1068, Appendix I, Title 13, CCR, § 2425(d), and components from any other system you developed~~d~~ to control emissions. The emission-related warranty covers these components even if another company produces the component. Your emission-related warranty does not need to cover components whose failure would not increase an engine's emissions of any regulated pollutant.

* * * * *

§ 1039.125 What maintenance instructions must I give to buyers?

* * * * *

(a)(1)(iii) DELETE,
REPLACE WITH:
(a)(1)(iii) You provide the maintenance free of charge and clearly say so in your maintenance instructions~~ for the customer~~.

* * * * *

(a)(2)(i) DELETE,
REPLACE WITH:
(a)(2)(i) For EGR-related filters and coolers, PCV valves, crankcase vent filters, and fuel injector tips (cleaning only), the minimum interval is 1,500 hours.

(a)(2)(ii) DELETE,
REPLACE WITH:
(a)(2)(ii) For the following components, including associated sensors and actuators, the minimum interval is 3000 hours: fuel injectors, turbochargers, catalytic converters, electronic control units~~, particulate traps, trap oxidizers, components related to particulate traps and trap oxidizers~~, EGR systems (including related components, but excluding filters and coolers), and other add-on components~~. For particulate traps, trap oxidizers, and components related to either of these, maintenance is limited to cleaning and repair only~~.

(a)(3) DELETE,
REPLACE WITH:
(a)(3) For engines at or above 130 kW, you may not schedule critical emission-related maintenance more frequently than the following minimum intervals, except as specified in paragraphs (a)(4), (b), and (c) of this section:
(i) For EGR-related filters and coolers, PCV valves, crankcase vent filters, and fuel injector tips (cleaning only), the minimum interval is 1,500 hours.
(ii) For the following components, including associated sensors and actuators, the minimum interval is 4500 hours: fuel injectors, turbochargers, catalytic converters, electronic control units, particulate traps, trap oxidizers, components related to particulate traps and trap oxidizers, EGR systems (including related components, but excluding filters and coolers), and other add-on components~~. For particulate traps, trap oxidizers, and components related to either of these, maintenance is limited to cleaning and repair only.~~

(a)(4) DELETE,
REPLACE WITH,
(a)(4) ~~If your engine family has an alternate useful life under §1039.101(g) that is shorter than the period specified in paragraph (a)(2) or (a)(3) of this section, you may not schedule critical emission-related maintenance more frequently than the alternate useful life, except as specified in paragraph (c) of this section.~~For particulate traps, trap oxidizers, and components related to either of these, scheduled maintenance may include cleaning or repair at the intervals specified in paragraph (a)(2) or (3) of this section, as applicable. Scheduled maintenance may include a shorter interval for cleaning or repair and may also include adjustment or replacement, but only if we approve it. We will approve your request if you provide the maintenance free of charge, ~~and~~ clearly state ~~this~~ in your maintenance instructions that the service is to be provided free of charge, and the Executive Officer or his/her designee determines there is a high likelihood that the maintenance will occur. The Executive Officer may request the submission of additional information to aid in making this determination.

ADD:
(a)(5) You may ask us to approve a maintenance interval shorter than that specified in paragraphs (a)(2) and (a)(3) of this section under §1039.210, including emission-related components that were not in widespread use with off-road compression-ignition engines before 2011. In your request you must describe the proposed maintenance step, recommend the maximum feasible interval for this maintenance, include your rationale with supporting evidence to support the need for the maintenance at the recommended interval, and demonstrate that the maintenance will be done at the recommended interval on in-use engines. In considering your request, we will evaluate the information you provide and any other available information to establish alternate specifications for maintenance intervals, if appropriate. We will announce any decision we make under this paragraph (a)(5) in an ARB manufacturers advisory correspondence or other suitable method of public communication. Anyone may request a hearing regarding such a decision (see §1039.820).

ADD:
(a)(6) If your engine family has an alternate useful life under §1039.101(g) that is shorter than the period specified in paragraph (a)(2) or (a)(3) of this section, you may not schedule critical emission-related maintenance more frequently than the alternate useful life, except as specified in paragraph (c) of this section.

* * * * *

(c) DELETE,
REPLACE WITH:
(c) Special maintenance. You may specify more frequent maintenance to address problems related to special situations, such as atypical engine operation. You must clearly state that this additional maintenance is associated with the special situation you are addressing. We may disapprove your maintenance instructions if we determine that you have specified special maintenance steps to address engine operation that is not atypical, or that the maintenance is unlikely to occur in use. If we determine that certain maintenance items do not qualify as special maintenance under this paragraph (c), you may identify this as recommended additional maintenance under paragraph (b) of this section.

(d) DELETE,
REPLACE WITH:
(d) Noncritical emission-related maintenance. ~~Y~~Subject to the provisions of this paragraph (d), you may schedule any amount of emission-related inspection or maintenance that is not covered by paragraph (a) of this section, ~~as long as you~~ (that is, maintenance that is neither explicitly identified as critical emission-related maintenance, nor that we approve as critical emission-related maintenance). Noncritical emission-related maintenance generally includes maintenance on the components we specify in 40 CFR part 1068, Appendix I, that is not covered in paragraph (a) of this section. You must state in the owner's manual that these steps are not necessary to keep the emission-related warranty valid. If operators fail to do this maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim. You may ~~Do~~ not take these inspection or maintenance steps during service accumulation on your emission-data engines.

* * * * *

(f) DELETE,
REPLACE WITH:
(f) Source of parts and repairs. State clearly on the first page of your written maintenance instructions that a repair shop or person of the owner's choosing may maintain, replace, or repair emission-control devices and systems. Your instructions may not require components or service identified by brand, trade, or corporate name. Also, do not directly or indirectly condition your warranty on a requirement that the ~~equipment~~engine be serviced by your franchised dealers or any other service establishments with which you have a commercial relationship. You may disregard the requirements in this paragraph (f) if you do one of two things:
(1) Provide a component or service without charge under the purchase agreement.
(2) Get us to waive this prohibition in the public's interest by convincing us the engine will work properly only with the identified component or service.

(g) DELETE,
REPLACE WITH:
(g) Payment for scheduled maintenance. Owners are responsible for properly maintaining their engines. This generally includes paying for scheduled maintenance. However, manufacturers must pay for scheduled maintenance during the useful life if the regulations require it or if it meets all the following criteria:
(1) Each affected component was not in general use on similar engines before the applicable dates shown in paragraph (6) of the definition of new off-road engine in §1039.801.
(2) The primary function of each affected component is to reduce emissions.
(3) The cost of the scheduled maintenance is more than 2 percent of the price of the engine.
(4) Failure to perform the maintenance would not cause clear problems that would significantly degrade the engine's performance.

* * * * *

§ 1039.130 What installation instructions must I give to equipment manufacturers?

* * * * *

§ 1039.135 How must I label and identify the engines I produce?

* * * * *

(c)(4) DELETE,
REPLACE WITH:
(c)(4) State the power category or subcategory from §1039.101 or §1039.102 that determines the applicable emission standards for the engine family. For engines at or above 37 kW and below 56 kW from model years 2008 through 2012, and for engines less than 8 kW utilizing the provision at §1039.101(c), you must state the applicable PM standard for the engine family.

* * * * *

(c)(6) DELETE,
REPLACE WITH:
(c)(6) State the date of manufacture [MONTH and YEAR]. ~~You may omit this from the label if you keep a record of the engine-manufacture dates and provide it to us upon request.~~

* * * * *

(c)(8) DELETE,
REPLACE WITH:
(c)(8) Identify the emission-control system. Use terms and abbreviations ~~consistent with SAE J1930 (incorporated by reference~~ as described in ~~§1039~~ 40 CFR 1068.~~810)~~45. You may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

* * * * *

(g) DELETE,
REPLACE WITH:
(g) If you obscure the engine label while installing the engine in the equipment such that the label is no longer readily visible as described in 13 CCR 2424(e), you must place a duplicate label on the equipment. If others install your engine in their equipment in a way that obscures the engine label, we require them to add a duplicate label on the equipment (see 40 CFR 1068.105); in that case, give them the number of duplicate labels they request and keep the following records for at least five years:

(1) Written documentation of the request from the equipment manufacturer.
(2) The number of duplicate labels you send for each engine family and the date you sent them.

* * * * *

§ 1039.140 What is my engine's maximum engine power?

* * * * *

Subpart C – Certifying Engine Families

§ 1039.201 What are the general requirements for obtaining an Executive Order?

* * * * *

§ 1039.205 What must I include in my application?

* * * * *

(o) DELETE,
REPLACE WITH:
(o) Present emission data for hydrocarbons (such as NMHC or THCE, as applicable), NOx, PM, and CO on an emission--data engine to show your engines meet the applicable duty-cycle emission standards we specify in §1039.101. Show emission ~~data~~ figures before and after applying adjustment factors for regeneration and deterioration factors for each engine. Include emission results for each mode if you do discrete-mode testing under §1039.505. Present emission data to show that you meet any applicable smoke standards we specify in §1039.105. If we specify more than one grade of any fuel type (for example, high-sulfur and low-sulfur diesel fuel), you need to submit test data only for one grade, unless the regulations of this part specify otherwise for your engine. Note that §1039.235 allows you to submit an application in certain cases without new emission data.

* * * * *

(r) DELETE,
REPLACE WITH:
(r) Report test results as follows:

(1) Report all test results~~, including those~~ involving measurement of pollutants for which emission standards apply. Include test results from invalid tests or from any other tests, whether or not they were conducted according to the test procedures of subpart F of this part. ~~If you measure CO2, report those emission levels~~. We may ask you to send other information to confirm that your tests were valid under the requirements of this part and 40 CFR part 1065.

(2) Report measured CO2, N2O, and CH4 as described in §1039.235. Small-volume engine manufacturers may omit reporting N2O and CH4.

* * * * *

(v) DELETE,
REPLACE WITH:
(v) State whether your certification is intended to include engines used in stationary applications. State whether your certification is limited for certain engines. If this is the case, describe how you will prevent use of these engines in applications for which they are not certified. This applies for engines such as the following:

(1) Constant-speed engines.

(2) Engines used for transportation refrigeration units that you certify under the provisions of §1039.645.

(3) Hand-startable engines certified under the provisions of §1039.101(c).

(4) Engines above 560 ~~k~~KW that are not certified to emission standards for generator-set engines.

* * * * *

(x) DELETE,
REPLACE WITH:
(x) Include good-faith estimates of U.S.-directed production volumes and, if available, California-directed production volumes. Include a justification for the estimated production volumes if they are substantially different than actual production volumes in earlier years for similar models.

* * * * *

ADD:
(aa) Name an agent for service located in California, or if you have no California agent, in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by ARB or otherwise by ~~the~~ the State of California related to the requirements of this part.

§ 1039.210 May I get preliminary approval before I complete my application?

* * * * *

§ 1039.220 How do I amend the maintenance instructions in my application?

DELETE,
REPLACE WITH:
You may amend your emission--related maintenance instructions after you submit your application for certification, as long as the amended instructions remain consistent with the provisions of §1039.125. You must send the ~~Designated Compliance Officer~~ Executive Officer or his/her designee a written request to amend your application for certification for an engine family if you want to change the emission--related maintenance instructions in a way that could affect emissions. In your request, describe the proposed changes to the maintenance instructions. ~~We will disapprove your request if we determine that the amended instructions are inconsistent with maintenance you performed on emission-data engines.~~ If operators follow the original maintenance instructions rather than the newly specified maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim.
(a) If you are decreasing ~~the~~ or eliminating any specified maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. This would generally include replacing one maintenance step with another. We may approve a shorter time or waive this requirement.

(b) If your requested change would not decrease the specified maintenance, you may distribute the new maintenance instructions any time after you send your request. For example, this paragraph (b) would cover adding instructions to increase the frequency of ~~a maintenance step~~ filter changes for engines in severe-duty applications.
(c) You need not request approval if you are making only minor corrections (such as correcting typographical mistakes), clarifying your maintenance instructions, or changing instructions for maintenance unrelated to emission control. We may ask you to send us copies of maintenance instructions revised under this paragraph (c).

§ 1039.225 How do I amend my application for certification ~~to include new or modified engines or to change an FEL~~?

DELETE,
REPLACE WITH:
Before we issue you ~~a certificate of conformity~~ an Executive Order, you may amend your application to include new or modified engine configurations, subject to the provisions of this section. After we have issued your ~~certificate of conformity~~ Executive Order, you may send us an amended application requesting that we include new or modified engine configurations within the scope of the ~~certificate~~ Order, subject to the provisions of this section. You must amend your application if any changes occur with respect to any information that is included or should be included in your application.

(a) You must amend your application before you take ~~either~~ any of the following actions:

(1) Add an engine ~~(that is, an additional engine~~ configuration~~)~~ to an engine family. In this case, the engine configuration added must be consistent with other ~~engines~~ engine configurations in the engine family with respect to the criteria listed in §1039.230.

(2) Change an engine configuration already included in an engine family in a way that may affect emissions, or change any of the components you described in your application for certification. This includes production and design changes that may affect emissions any time during the engine's lifetime.

(3) Modify an FEL for an engine family, as described in paragraph (f) of this section.

(b) To amend your application for certification, send the following ~~relevant~~ information, as applicable, to the ~~Designated Compliance Officer~~ Executive Officer or his/her designee ~~the following information~~:

(1) Describe in detail the addition or change in the engine model or configuration you intend to make.

(2) Include engineering evaluations or data showing that the amended engine family complies with all applicable requirements. You may do this by showing that the original emission-data engine is still appropriate ~~with respect to~~ for showing ~~compliance of~~ that the amended family complies with all applicable requirements.

(3) If the original emission-data engine for the engine family is not appropriate to show compliance for the new or modified ~~off-road~~ engine configuration, include new test data showing that the new or modified ~~off-road~~ engine configuration meets the requirements of this part.

(c) We may ask for more test data or engineering evaluations. You must give us these within 30 days after we request them.

(d) For engine families already covered by ~~a certificate of conformity~~ an Executive Order, we will determine whether the existing certificate of conformity covers your ~~new~~ newly added or modified ~~off-road~~ engine. You may ask for a hearing if we deny your request (see §1039.820).

(e) For engine families already covered by ~~a certificate of conformity~~ an Executive Order, you may start producing the new or modified ~~off-road~~ engine configuration any time after you send us your amended application, and before we make a decision under paragraph (d) of this section. However, if we determine that the affected engines do not meet applicable requirements, we will notify you to cease production of the engines and may require you to recall the engines at no expense to the owner. Choosing to produce engines under this paragraph (e) is deemed to be consent to recall all engines that we determine do not meet applicable emission standards or other requirements and to remedy the nonconformity at no expense to the owner. If you do not provide information required under paragraph (c) of this section within 30 days after we request it, you must stop producing the new or modified ~~off-road~~ engines.

(f) You may ask us to approve a change to your FEL in ~~the following~~ certain cases~~:~~
~~(1) You may ask to raise your FEL~~ after the start of production. ~~You~~The changed FEL may not apply ~~the higher FEL~~ to engines you have already introduced into ~~commerce. Use the appropriate FELs with corresponding sales volumes to calculate your average emission level,~~ U.S. commerce, except as described in ~~subpart H of this part. In your request, you must demonstrate that you will still be able to comply with the applicable average emission standards as specified in subparts B and H of this part.~~
~~(2) You may ask to lower the FEL for your engine family~~ this paragraph (f). If we approve a changed FEL after the start of production ~~only when you have test data from production engines indicating that your engines comply with the lower FEL. You may create a separate subfamily with the lower FEL. Otherwise, you must use the higher FEL for the family to calculate your average emission level under subpart H of this part.~~
~~(3) If you change the FEL during production~~, you must include the new FEL on the emission control information label for all engines produced after the change. You may ask us to approve a change to your FEL in the following cases:

(1) You may ask to raise your FEL for your engine family at any time. In your request, you must show that you will still be able to meet the emission standards as specified in subparts B and H of this part. If you amend your application by submitting new test data to include a newly added or modified engine, as described in paragraph (b)(3) of this

section, use the appropriate FELs with corresponding production volumes to calculate emission credits for the model year, as described in subpart H of this part. In all other circumstances, you must use the higher FEL for the entire engine family to calculate emission credits under subpart H of this part.

(2) You may ask to lower the FEL for your engine family only if you have test data from production engines showing that emissions are below the proposed lower FEL. The lower FEL applies only to engines you produce after we approve the new FEL. Use the appropriate FELs with corresponding production volumes to calculate emission credits for the model year, as described in subpart H of this part.

§ 1039.230 How do I select engine families?

DELETE,
REPLACE WITH:

(a) ~~D~~For purposes of certification, divide your product line into families of engines that are expected to have similar emission characteristics throughout the useful life as described in this section. Your engine family is limited to a single model year.

(b) Group engines in the same engine family if they are the same in all the following aspects:

(1) The combustion cycle and fuel.

(2) The cooling system (water-cooled vs. air-cooled).

(3) Method of air aspiration.

(4) Method of exhaust aftertreatment (for example, catalytic converter or particulate trap).

(5) Combustion chamber design.

(6) Bore and stroke.

(7) ~~Number of cylinders (~~Cylinder arrangement (such as in-line vs. vee configurations). This applies for engines with aftertreatment devices only).

~~(8) Cylinder arrangement (for engines with aftertreatment devices only).~~

(~~9~~8) Method of control for engine operation other than governing (i.e., mechanical or electronic).

(~~10~~9) Power category.

(~~11~~10) Numerical level of the emission standards that apply to the engine.

(c) You may subdivide a group of engines that is identical under paragraph (b) of this section into different engine families if you show the expected emission characteristics are different during the useful life.

(d) ~~Y~~In unusual circumstances, you may group engines that are not identical with respect to the things listed in paragraph (b) of this section in the same engine family if you show that their emission characteristics during the useful life will be similar.

(e) If you combine engines from different power categories into a single engine family under paragraph (d) of this section, you must certify the engine family to the more stringent set of standards from the two power categories in that model year.

§ 1039.235 What ~~emission testing must I perform for my application for an Executive Order~~ testing requirements apply for certification?

* * * * *

(c) DELETE,
REPLACE WITH:
(c) We may measure emissions from any of your ~~test~~ emission-data engines or other engines from the engine family, as follows:

(1) We may decide to do the testing at your plant or any other facility. If we do this, you must deliver the ~~test~~ engine to a test facility we designate. The ~~test~~ engine you provide must include appropriate manifolds, aftertreatment devices, electronic control units, and other emission-related components not normally attached directly to the engine block. If we do the testing at your plant, you must schedule it as soon as possible and make available the instruments, personnel, and equipment we need.

(2) If we measure emissions on one of your ~~test~~ engines, the results of that testing become the official emission results for the engine. Unless we later invalidate these data, we may decide not to consider your data in determining if your engine family meets applicable requirements.

(3) Before we test one of your engines, we may set its adjustable parameters to any point within the physically adjustable ranges (see §1039.115(e)).

(4) Before we test one of your engines, we may calibrate it within normal production tolerances for anything we do not consider an adjustable parameter. For example, this would apply for an engine parameter that is subject to production variability because it is adjustable during production, but is not considered an adjustable parameter (as defined in §1039.801) because it is permanently sealed.

(d) DELETE,

REPLACE WITH:
(d) You may ask to use carryover emission data from a previous model year instead of doing new tests, but only if all the following are true:

(1) The engine family from the previous model year differs from the current engine family only with respect to model year or other characteristics unrelated to emissions.

* * * * *

ADD:
(g) Measure CO2 and CH4 with each low-hour certification test using the procedures specified in 40 CFR part 1065 in the 2011 and 2012 model years, respectively. Also measure N2O with each low-hour certification test using the procedures specified in part 1065 of these Test Procedures starting in the 2013 model year for any engine family that depends on NOx aftertreatment to meet emission standards. Small-volume engine manufacturers may omit measurement of N2O and CH4. Additionally, manufacturers may omit direct measurement of N2O and CH4 for engines not subject to N2O and CH4 standards according to the provisions in 1065.5(a)(3). These measurements are not required for NTE testing. Use the same units and modal calculations as for your other results to report a single weighted value for each constituent. Round the final values as follows:

(1) Round CO2 to the nearest 1 g/kW-hr.

(2) Round N2O to the nearest 0.001 g/kW-hr.

(3) Round CH4 to the nearest 0.001g/kW-hr.

§ 1039.240 How do I demonstrate that my engine family complies with exhaust emission standards?

(a) DELETE,
REPLACE WITH:
(a) For purposes of certification, your engine family is considered in compliance with ~~the applicable numerical~~ emission standards in §1039.101(a) and (b), §1039.102(a) and (b), §1039.104, and §1039.105 if all emission-data engines representing that family have test results showing official emission results and deteriorated emission levels at or below these standards. ~~(Note: if you participate in the ABT program in subpart H of this part,~~ This also applies for all test points for emission-data engines within the family used to establish deterioration factors. Note that your FELs are considered to be the applicable emission standards with which you must comply if you participate in the ABT program in subpart H of this part.~~)~~

(b) DELETE,
REPLACE WITH:
(b) Your engine family is deemed not to comply if any emission-data engine representing that family has test results showing an official emission result or a deteriorated emission level for any pollutant that is above an applicable ~~FEL or~~ emission standard. Similarly, your engine family is deemed not to comply if any emission-data engine representing that family has test results showing any emission level above the applicable not-to-exceed emission standard from §1039.101, §1039.102, §1039.104, or §1039.105 for any pollutant. This also applies for all test points for emission-data engines within the family used to establish deterioration factors.

* * * * *

(c)(1) DELETE,
REPLACE WITH:
(c)(1) Additive deterioration factor for exhaust emissions. Except as specified in paragraph (c)(2) of this section, use an additive deterioration factor for exhaust emissions. An additive deterioration factor for a pollutant is the difference between exhaust emissions at the end of the useful life and exhaust emissions at the low-hour test point. In these cases, adjust the official emission results for each tested engine at the selected test point by adding the factor to the measured emissions. If the factor is less than zero, use zero. Additive deterioration factors must be specified to one more decimal place than the applicable standard.

* * * * *

§ 1039.245 How do I determine deterioration factors from exhaust durability testing?

Introductory Text DELETE,
REPLACE WITH:
~~Establish deterioration factors to determine whether your engines will meet emission standards for each pollutant throughout the useful life, as described in §§1039.101 and 1039.240.~~ This section describes how to determine deterioration factors, either with an engineering analysis, with pre-existing test data, or with new emission measurements. ~~If you are required to perform durability testing, see §1039.125 for limitations on the maintenance that you may perform on your emission-data engine.~~ Apply these deterioration factors to determine whether your engines will meet the duty-cycle emission standards as described in §1039.240 throughout the engines' useful lives.

* * * * *

§ 1039.250 What records must I keep and what reports must I send to the Air Resources Board (ARB)?

(a) DELETE,
REPLACE WITH:
(a) Within ~~30~~45 days after the end of the model year, send the Executive Officer or his/her designee a report describing the following information about engines you produced during tha~~t~~e model year:

* * * * *

(c) DELETE,
REPLACE WITH:
(c) Keep data from routine emission tests (such as test-cell temperatures and relative humidity readings) for one year after we issue the associated Executive Order. Keep all other information specified in ~~paragraph (a) of~~ this section for eight years after we issue your Executive Order.

* * * * *

(e) DELETE.

§ 1039.255 What decisions may ARB make regarding my Executive Order?

* * * * *

(b) DELETE,
REPLACE WITH:
(b) We may deny your application for certification if we determine that your engine family fails to comply with emission standards or other requirements of this part or the ~~Act. Our decision may be based on a review of all information available to~~ California Health and Safety Code, Division 26, and corresponding regulations. We will base our decision on all available information. If we deny your application, we will explain why in writing.

* * * * *

(d) DELETE,
REPLACE WITH:
(d) We may void your Executive Order if you do not keep the records we require or do not give us information ~~when we~~ as~~k for it~~ required under this part or the California Health and Safety Code, Division 26, and corresponding regulations.

* * * * *

Subpart D – [Reserved]

* * * * *

Subpart E – In-use Testing

§ 1039.401 General Provisions.

* * * * *

Subpart F – Test Procedures

§ 1039.501 How do I run a valid emission test?

(a) DELETE,
REPLACE WITH:
(a) Use the equipment and procedures for compression-ignition engines in 40 CFR part 1065 to determine whether engines meet the duty-cycle emission standards in subpart B of this part.~~101(a) and (b).~~ Measure the emissions of all the ~~pollutants we regulate in §1039.101exhaust constituents subject to emission standards as specified in 40 CFR part 1065~~ exhaust constituents subject to emission standards as specified in 40 CFR part 1065. Measure CO2, N2O, and CH4 as described in §1039.235. Use the applicable duty cycles specified in §§1039.505 and 1039.510.

(b) DELETE,
REPLACE WITH:
(b) Section 1039.515 describes the supplemental procedures for evaluating whether engines meet the not-to-exceed emission limits in ~~§1039.101(e)~~ subpart B of this part.

* * * * *

§ 1039.505 How do I test engines using steady-state duty cycles, including ramped-modal testing?

* * * * *

(a)(1) DELETE,
REPLACE WITH:
(a)(1) For discrete-mode testing, sample emissions separately for each mode, then calculate an average emission level for the whole cycle using the weighting factors specified for each mode. Calculate cycle statistics ~~for the sequence of modes~~ and compare with the established criteria as specified ~~values~~ in §1065.514 to confirm that the test is valid. Operate the engine and sampling system as follows:

(i) Engines with NOx aftertreatment. For engines that depend on aftertreatment to meet the NOx emission standard, operate the engine for 5-6 minutes, then sample emissions for 1-3 minutes in each mode. You may extend the sampling time to improve measurement accuracy of PM emissions, using good engineering judgment. If you have a longer sampling time for PM emissions, calculate and validate cycle statistics separately for the gaseous and PM sampling periods.

(ii) Engines without NOx aftertreatment. For other engines, operate the engine for at least 5 minutes, then sample emissions for at least 1 minute in each mode. ~~Calculate cycle statistics for the sequence of modes and compare with the specified values in §1065 to confirm that the test is valid.~~

* * * * *

(b) DELETE,
REPLACE WITH:
(b) Measure emissions by testing the engine on a dynamometer with one of the following duty cycles to determine whether it meets the steady-state emission standards in § 1039.101(b):

(1) Use the 5-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (a) of Appendix II of this part for constant-speed engines. Note that these cycles do not apply to all engines used in constant-speed applications, as described in §1039.801.

(2) Use the 6-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (b) of Appendix II~~I~~ of this part for variable-speed engines below 19 kW. You may instead use the 8-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (c) of Appendix I~~I~~V of this part if some engines from your engine family will be used in applications that do not involve governing to maintain engine operation around rated speed.

(3) Use the 8-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (c) of Appendix I~~I~~V of this part for variable-speed engines at or above 19 kW.

(c) DELETE,
REPLACE WITH:
(c) During idle mode, operate the engine at its warm idle speed as described in §1065. ~~with the following parameters:~~

~~(1) Hold the speed within your specifications.~~

~~(2) Set the engine to operate at its minimum fueling rate.~~

~~(3) Keep engine torque under 5 percent of maximum test torque.~~

(d) DELETE,
REPLACE WITH:
(d) ~~For full-load operating modes, operate the engine at its maximum fueling rate. However, for constant-speed~~ For constant-speed engines whose design prevents full-load operation for extended periods, you may ask for approval under §1065.10(c) to

replace full-load operation with the maximum load for which the engine is designed to operate for extended periods.

* * * * *

ADD:
(g) To allow non-motoring dynamometers on cycles with idle, you may omit additional points from the duty-cycle regression as follows:

(1) For variable-speed engines with low-speed governors, you may omit speed, torque, and power points from the duty-cycle regression statistics if the following are met:

(i) The engine operator demand is at its minimum.

(ii) The dynamometer demand is at its minimum.

(iii) It is an idle point fnref = 0 % (idle) and Tref = 0 % (idle).

(iv) Tref < T < 5 % · Tmax mapped.

(2) For variable-speed engines without low-speed governors, you may omit torque and power points from the duty-cycle regression statistics if the following are met:

(i) The dynamometer demand is at its minimum.

(ii) It is an idle point fnref = 0 % (idle) and Tref = 0 % (idle).

(iii) fnref - (2 % · fntest) < fn < fnref + (2 % · fntest).

(iv) Tref < T < 5 % · Tmax mapped.

§ 1039.510 Which duty cycles do I use for transient testing?

* * * * *

(b) DELETE,
REPLACE WITH:
(b) The transient test sequence consists of an initial run through the transient duty cycle from a cold start, 20 minutes with no engine operation, then a final run through the same transient duty cycle. Start sampling emissions immediately after you start the engine. Calculate the official transient emission result from the following equation:
~~Official transient emission result = 0.05 × cold-start emission rate + 0.95 × hot-start emission rate.~~

$$\text{Official transient emission result} = \frac{0.05 \cdot \text{cold-start emissions (g)} + 0.95 \cdot \text{hot-start emissions (g)}}{0.05 \cdot \text{cold-start work (kW-hr)} + 0.95 \cdot \text{hot-start work (kW-hr)}}$$

(c) DELETE,
REPLACE WITH:
(c) ~~Cool the engine down between tests as described in 40 CFR 86.1335-90.~~ Calculate cycle statistics and compare with the established criteria as specified in §1065.514 to confirm that the test is valid.

(d) DELETE:
~~(d) For validating cycle statistics, you may delete from your regression analysis speed, torque, and power points for the first 23 seconds and the last 25 seconds of the transient duty cycle.~~

§ 1039.515 What are the test procedures related to not-to-exceed limits?

* * * * *

§ 1039.520 What testing must I perform to establish deterioration factors?

* * * * *

§ 1039.525 How do I adjust emission levels to account for infrequently regenerating aftertreatment devices?

* * * * *

Subpart G – Special Compliance Provisions

§ 1039.601 What compliance provisions apply to these engines?

* * * * *

§ 1039.615 What special provisions apply to engines using noncommercial fuels?

* * * * *

§ 1039.620 What are the provisions for exempting engines used solely for competition?

* * * * *

§ 1039.625 What requirements apply under the program for equipment-manufacturer flexibility?

* * * * *

(e) Introductory Text DELETE,
REPLACE WITH:
Standards. If you produce equipment with exempted engines under this section, the engines must meet emission standards ~~at least as stringent as the following:~~ specified in this paragraph (e). Note that we consider engines to be meeting emission standards even if they are certified with a family emission limit that is higher than the emission standard that would otherwise apply.

* * * * *

(e)(1) DELETE,
REPLACE WITH:
(e)(1) Equipment manufacturers using the provisions of paragraph (d)(4) of this section, must use engines that, at a minimum, meet the applicable Tier 1 or Tier 2 emission standards in Title 13, CCR, § 2423(b)(1)(a).

* * * * *

(e)(3) DELETE,
REPLACE WITH:
(e)(3) In all other cases, engines at or above ~~37~~ 56 kW and at or below 560 kW must meet the appropriate Tier 3 standards described in Title 13, CCR, § 2423(b)(1)(a). Engines below ~~37~~ 56 kW and engines above 560 kW must meet the appropriate Tier 2 standards described in Title 13, CCR, § 2423(b)(1)(a).

* * * * *

(f)(4) DELETE,
REPLACE WITH:
(f)(4) ~~The name,~~ An e-mail address~~,~~ and phone number ~~of a person~~ to contact for further information, or a website that includes this contact information.

* * * * *

(g)(1) DELETE,
REPLACE WITH:
(g)(1) Before ~~January 1 of the first year~~ you ~~intend to~~ use the provisions of this section, send the Executive Officer or his/her designee a written notice of your intent, including:

* * * * *

(ii) ~~Whom~~ The name, phone number and e-mail address of a person to contact for more information.

* * * * *

(iv) The name and address of ~~the~~ each company ~~that produces the~~ you expect to produce engines ~~you will be using~~ for the equipment ~~exempted~~ you manufacture under this section.

* * * * *

(g)(2) DELETE,
REPLACE WITH:
(g)(2) For each year that an equipment manufacturer uses the provisions of this section, the manufacturer must send the Executive Officer a written report by March 31 of the following year. In ~~T~~the report, the manufacturer shall ~~include~~ identify the total ~~number~~ count of ~~engines~~ units sold by the manufacturer in the preceding year for each power category, based on actual U.S.-directed production volume and, if available, California-directed production volume. ~~Also, t~~The manufacturer ~~must~~ shall also identify in the report the percentages of U.S.-directed production volumes and, if available, California-directed production volumes, that correspond to the number of units in each power category and the cumulative numbers and percentages of units for all the units sold by the manufacturer under this section for each power category. The percentage figures may be omitted if the manufacturer states in the report that it will not be using the percent-of-production allowances in paragraph (b)(1) of this section. If the manufacturer(s) of the engine installed in the equipment has not already been identified as required in §1039.625(g)(1)(iv), the equipment manufacturer shall identify the name and address of this engine manufacturer(s) in the report.

* * * * *

(h)(1) DELETE,
REPLACE WITH:
(h)(1) The model number, serial number, engine family name, and the date of manufacture for each engine and piece of equipment.

(j)(2) DELETE,
REPLACE WITH:
(j)(2) Engine labeling. Engine manufacturers shall meet the labeling requirements provided in §1039.135 for all engines produced under the allowances of this section, except that manufacturers may omit the family emission limits from the label only if the limits are more stringent than the emissions standards. ~~However~~ Additionally, the following statement must be substituted for the statement of compliance required under §1039.135(12):

> "THIS ENGINE COMPLIES WITH CALIFORNIA EMISSION REQUIREMENTS UNDER 13 CCR 2423(d). SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN FOR THE EQUIPMENT FLEXIBILITY PROVISIONS CITED MAY BE A VIOLATION OF STATE LAW SUBJECT TO CIVIL PENALTY." [Insert Engine Family Name]

The referencing of similar federal requirements in combination with California references under this provision is permitted. Furthermore, the Executive Officer may, upon request, approve alternate labeling specifications provided that they meet the intent of this requirement.

§ 1039.626 What special provisions apply to equipment imported under the equipment-manufacturer flexibility program?

* * * * *

(b)(1) DELETE,
REPLACE WITH:
(b)(1) Before ~~January 1 of the first year~~ you ~~intend to~~ use the provisions of this section, send the Executive Officer of the Air Resources Board, or his/her designee, a written notice of your intent, including:

* * * * *

§ 1039.627 What are the incentives for equipment manufacturers to use cleaner engines?

* * * * *

§ 1039.630 What are the economic hardship provisions for equipment manufacturers?

* * * * *

§ 1039.635 What are the hardship provisions for engine manufacturers?

* * * * *

§ 1039.640 What special provisions apply to branded engines?

* * * * *

§ 1039.645 What special provisions apply to engines used for transportation refrigeration units?

* * * * *

§ 1039.650 [Reserved]

* * * * *

§ 1039.660 What special provisions apply to Independent Commercial Importers?

* * * * *

Subpart H – Averaging, Banking, and Trading for Certification

§ 1039.701 General provisions.

* * * * *

§ 1039.705 How do I generate and calculate emission credits?

* * * * *

(a) DELETE,
REPLACE WITH:
(a) ~~Calculate positive emission credits for an engine family that has an FEL below the otherwise applicable standard. Calculate negative emission credits for an engine family that has an FEL above the otherwise applicable standard.~~ [Reserved]

(b) DELETE,
REPLACE WITH:
(b) For each participating ~~engine~~ family, calculate positive or negative emission credits relative to the otherwise applicable emission standard. ~~Round calculated~~ Calculate positive emission credits for a family that has an FEL below the standard. Calculate negative emission credits for a family that has an FEL above the standard. Sum your positive and negative credits for the model year before rounding. Round the sum of emission credits to the nearest kilogram (kg), using consistent units throughout the following equation:

$$\text{Emission credits (kg)} = (\text{Std} - \text{FEL}) \times (\text{Volume}) \times (\text{AvgPR}) \times (\text{UL}) \times (10^{-3})$$

Where:

Std = the emission standard, in grams per kilowatt-hour, that applies under subpart B of this part for engines not participating in the ABT program of this subpart (the "otherwise applicable standard").

FEL = the family emission limit for the engine family, in grams per kilowatt-hour.

Volume = the number of engines eligible to participate in the averaging, banking, and trading program within the given engine family during the model year, as described in paragraph (c) of this section.

AvgPR = the average maximum engine power of all the engine configurations within an engine family, calculated on a sales-weighted basis, in kilowatts.

UL = the useful life for the given engine family, in hours.

* * * * *

§ 1039.710 How do I average emission credits?

* * * * *

§ 1039.715 How do I bank emission credits?

DELETE,
REPLACE WITH:
(a) Banking is the retention of emission credits by the manufacturer generating the emission credits for use in future model years for averaging or trading ~~in future model years. You may use banked emission credits only within the averaging set in which they were generated~~.

(b) ~~In your application for certification,~~ You may designate any emission credits you ~~intend~~ plan to bank~~. These emission credits will be considered~~ in the reports you submit under §1039.730 as reserved credits. During the model year and before the due date for the final report, you may ~~redesignate these~~ designate your reserved emission credits for averaging or trading.

(c) ~~You may use banked~~ Reserved credits become actual emission credits ~~from the previous model year for averaging or trading before we verify them, but~~ when you submit your final report. However, we may revoke these emission credits if we are unable to verify them after reviewing your reports or auditing your records.

~~(d) Reserved credits become actual emission credits only when we verify them in reviewing your final report.~~

§ 1039.720 How do I trade emission credits?

* * * * *

(b) DELETE,
REPLACE WITH:
(b) You may trade actual emission credits as described in this subpart. You may also trade reserved emission credits, but we may revoke these emission credits based on our review of your records or reports or those of the company with which you traded emission credits. You may trade banked credits within an averaging set to any certifying manufacturer.

* * * * *

§ 1039.725 What must I include in my application for certification?

* * * * *

(b)(2) DELETE,
REPLACE WITH:
(b)(2) Detailed calculations of projected emission credits (positive or negative) based on projected production volumes. ~~If your engine family will generate positive emission credits, state specifically where the emission credits will be applied (for example, to which engine family they will be applied in averaging, whether they will be traded, or whether they will be reserved for banking). If you have projected~~ We may require you to include similar calculations from your other engine families to demonstrate that you will be able to avoid a negative credit balance for the model year. If you project negative emission credits for ~~an engine~~ a family, state the source of positive emission credits you expect to use to offset the negative emission credits. ~~Describe whether the emission credits are actual or reserved and whether they will come from averaging, banking, trading, or a combination of these. Identify from which of your engine families or from which manufacturer the emission credits will come.~~

§ 1039.730 What ABT reports must I send to ARB?

* * * * *

(b)(3) DELETE,
REPLACE WITH:
(b)(3) The FEL for each pollutant. If you ~~changed an FEL during the model year~~ change the FEL after the start of production, identify the date that you started using the new FEL and/or give the engine identification number for the first engine covered by the new FEL. In this case, identify each applicable FEL ~~you used~~ and calculate the positive or negative emission credits ~~under each FEL. Also, describe how the applicable FEL can be identified for each engine you produced. For example, you might keep a list of engine identification numbers that correspond with certain FEL values~~ as specified in §1039.225.

(b)(4) DELETE,
REPLACE WITH:
(b)(4) The projected and actual U.S.-directed production volumes, and California production volumes if available, for the model year ~~with a point of retail sale in the United States~~. If you changed an FEL during the model year, identify the actual production volume associated with each FEL.

(b)(5) DELETE,
REPLACE WITH:
(b)(5) Maximum engine power for each engine configuration, and the ~~sales-weighted~~ average engine power weighted by U.S.-directed production volumes, and California production volumes if available, for the engine family.

* * * * *

(c)(1) DELETE,
REPLACE WITH:
(c)(1) Show that your net balance of emission credits from all your participating engine families in each averaging set in the applicable model year is not negative.

* * * * *

(f)(2) DELETE,
REPLACE WITH:
(f)(2) If you or we determine within 270 days after the end of the model year that errors mistakenly decreased your balance of emission credits, you may correct the errors and recalculate the balance of emission credits. You may not make these corrections for errors that are determined more than 270 days after the end of the model year. If you report a negative balance of emission credits, we may disallow corrections under this paragraph (f)(2).

* * * * *

§ 1039.735 What records must I keep?

* * * * *

(b) DELETE,
REPLACE WITH:
(b) Keep the records required by this section for at least eight years after the due date for the end-of-year report. You may ~~use any appropriate storage formats or media, including paper, microfilm, or computer diskettes~~ not use emission credits for any engines if you do not keep all the records required under this section. You must therefore keep these records to continue to bank valid credits. Store these records in any format and on any media, as long as you can promptly send us organized, written records in English if we ask for them. You must keep these records readily available. We may review them at any time.

* * * * *

(d)(6) DELETE,
REPLACE WITH:
(d)(6) Purchaser. You must also identify the purchaser and destination for each engine you produce to the extent this information is available.

(e) We may require you to keep additional records or to send us relevant information not required by this section in accordance with the California Health and Safety Code, Division 26, and corresponding regulations.

§ 1039.740 What restrictions apply for using emission credits?

* * * * *

§ 1039.745 What can happen if I do not comply with the provisions of this subpart?

* * * * *

Subpart I – Definitions and Other Reference Information

§ 1039.801 What definitions apply to this part?

* * * * *

ADD:
40 CFR part 1039 or Part 1039 means Part 1039 and applicable subparts of the California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression-Ignition Engines, PART I-D, when referenced in unrevised (i.e., " * * * * * * ") sections. When referenced in revised sections, the term 40 CFR part 1039 refers to the federal regulations of the same title, last amended on June 28, 2011.

40 CFR part 1065 DELETE,
REPLACE WITH:
40 CFR part 1065 or Part 1065 means Part 1065 and applicable subparts ~~of these 2008 and Later Test procedures~~ of the California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression-Ignition Engines, PART I-E, when referenced in unrevised (i.e., " * * * * * * ") sections. When referenced in revised sections, the term 40 CFR part 1065 refers to the federal regulations of the same title, last amended on June 28, 2011.

40 CFR part 1068 DELETE,
REPLACE WITH:
40 CFR part 1068 or Part 1068 means Part 1068 and applicable subparts ~~of these 2008 and Later Test procedures~~ of the California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression-Ignition Engines, PART I-F, when referenced in unrevised (i.e., " * * * * * * ") sections. When referenced in revised sections, the term 40 CFR part 1068 refers to the federal regulations of the same title, last amended on June 28, 2011.

* * * * *

ADD:
Alcohol-fueled engine means an engine that is designed to run using an alcohol fuel. For purposes of this definition, alcohol fuels do not include fuels with a nominal alcohol content below 25 percent by volume.

* * * * *

ADD:
Carryover means relating to certification based on emission data generated from an earlier model year as described in §1039.235(d).

Certification DELETE,
REPLACE WITH:
Certification means relating to the process of obtaining an executive order for an engine family complying with the off-road compression-ignition engine emission standards and requirements specified in Title 13, CCR, Chapter 9, §§ 2420-2427.

* * * * *

Constant Speed Operation DELETE,
REPLACE WITH:
Constant-speed operation ~~means engine operation with a governor that controls the operator input to maintain an engine at a reference speed, even under changing load. For example, an isochronous governor changes reference speed temporarily during a load change, then returns the engine to its original reference speed after the engine stabilizes. Isochronous governors typically allow speed changes up to 1.0 %. Another example is a speed-droop governor, which has a fixed reference speed at zero load and allows the reference speed to decrease as load increases. With speed-droop governors, speed typically decreases (3 to 10) % below the reference speed at zero load, such that the minimum reference speed occurs near the engine's point of maximum power~~ has the meaning given in §1065.1001.

* * * * *

ADD:
Date of manufacture has the meaning given in §1068.30.

* * * * *

Emission-control system DELETE,
REPLACE WITH:

Emission-control system means any device, system, or element of design that controls or reduces the emissions of regulated ~~emissions~~ pollutants from an engine.

* * * * *

Engine configuration DELETE,
REPLACE WITH:
Engine configuration means a unique combination of engine hardware and calibration within an engine family. Engines within a single engine configuration differ only with respect to normal production variability or factors unrelated to emissions.

* * * * *

Intermediate test speed DELETE,
REPLACE WITH:
Intermediate test speed has the meaning ~~we~~ given in §1065.~~515~~1001.

Model year (2) DELETE,
REPLACE WITH:
(2) For an engine that is converted to an off-road engine after being placed into service as a ~~motor-vehicle engine or a~~ stationary engine, or being certified and placed into service as a vehicle ~~engine~~, model year means the calendar year in which the engine was originally produced. For a vehicle that is converted to be an off-road engine without having been certified, model year means the calendar year in which the engine becomes a new off-road engine. (see definition of “new off-road engine,” paragraph (2).).

* * * * *

ADD:
Model year (5)(iii) For imported engines described in paragraph (5)(iii) of the definition of "new off-road engine," model year means the calendar year in which the engine is first assembled in its imported configuration, unless specified otherwise in this part or in §1068.

* * * * *

New nonroad engine DELETE,
REPLACE WITH:
New ~~non~~off-road engine means any of the following things:
(1) A freshly manufactured off-road engine for which the ultimate purchaser has never received the equitable or legal title. This kind of engine might commonly be thought of as "brand new." In the case of this paragraph (1), the engine ~~becomes~~ is new ~~when it is fully assembled for the first time. The engine is no longer new when~~ from the time it is

produced until the ultimate purchaser receives the title or the product is placed into service, whichever comes first.

(2) An engine originally manufactured as a ~~motor~~ vehicle ~~engine~~ or a stationary engine that is later used or intended to be used in a piece of off-road equipment. In this case, the engine is no longer a ~~motor~~ vehicle or stationary engine and becomes a "new off-road engine." The engine is no longer new when it is placed into off-road service. This paragraph (2) applies if a vehicle or a stationary engine is installed in off-road equipment, or if a vehicle or a piece of stationary equipment is modified (or moved) to become off-road equipment.

(3) An off-road engine that has been previously placed into service in an application we exclude under §1039.5, whe~~re~~n that engine is installed in a piece of equipment that is covered by this part 1039. The engine is no longer new when it is placed into off-road service covered by this part 1039. For example, this would apply to a marine diesel engine that is no longer used in a marine vessel but is instead installed in a piece of off-road equipment subject to the provisions of this part.

(4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in new off-road equipment. This generally includes installation of used engines in new equipment. The engine is no longer new when the ultimate purchaser receives a title for the equipment or the product is placed into service, whichever comes first. ~~This generally includes installation of used engines in new equipment.~~

(5) An imported off-road engine, subject to the following provisions:

(i) An imported off-road engine covered by a certificate of conformity issued under this part that meets the criteria of one or more of paragraphs (1) through (4) of this definition, where the original engine manufacturer holds the certificate, is new as defined by those applicable paragraphs.

(ii) An imported ~~nonroad~~ engine covered by a certificate of conformity issued under this part, where someone other than the original engine manufacturer holds the certificate (such as when the engine is modified after its initial assembly), ~~becomes~~ is a new off-road engine when it is imported. It is no longer new when the ultimate purchaser receives a title for the engine or it is placed into service, whichever comes first.

(iii) An imported off-road engine that is not covered by a certificate of conformity issued under this part at the time of importation is new, but only if it was produced on or after the dates shown in the following table. This addresses uncertified engines and equipment initially placed into service that someone seeks to import into the United States. Importation of this kind of ~~new nonroad~~ engine (or equipment containing such an engine) is generally prohibited by §1068. However, the importation of such an engine is not prohibited if the engine has an earlier model year than that identified in the following table:

* * * * *

Nonmethane hydrocarbon DELETE,
REPLACE WITH:
Nonmethane hydrocarbons (NMHC) means the sum of all hydrocarbon species except methane. Refer to §1065.660 for NMHC determination. ~~means the difference between the emitted mass of total hydrocarbons and the emitted mass of methane.~~

* * * * *

ADD:
Owners manual means a document or collection of documents prepared by the engine manufacturer for the owner or operator to describe appropriate engine maintenance, applicable warranties, and any other information related to operating or keeping the engine. The owners manual is typically provided to the ultimate purchaser at the time of sale.

Oxides of Nitrogen DELETE,
REPLACE WITH:
Oxides of nitrogen has the meaning ~~we~~ given in §1065.1001.

* * * * *

Power Category (5) Round DELETE,
REPLACE WITH:
(5) Round ~~means to round numbers according to NIST Special Publication 811(incorporated by reference in §1039.810), unless otherwise specified~~ has the meaning given in §1065.1001.

* * * * *

Steady-state DELETE,
REPLACE WITH:
Steady-state ~~means relating to emission tests in which engine speed and load are held at a finite set of essentially constant values. Steady-state tests are either discrete-mode tests or ramped-modal tests~~ has the meaning given in §1065.1001.

* * * * *

Total hydrocarbon DELETE,
REPLACE WITH:
Total hydrocarbon has the meaning given in 40 CFR 1065.1001. This generally means the combined mass of organic compounds measured by the specified procedure for measuring total hydrocarbon, expressed as a hydrocarbon with ~~a~~an atomic hydrogen-to-carbon ~~mass~~ ratio of 1.85:1.

Total hydrocarbon equivalent DELETE,
REPLACE WITH:
Total hydrocarbon equivalent has the meaning given in 40 CFR 1065.1001. This generally means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, alcohols and aldehydes, or other organic compounds that are measured separately as contained in a gas sample, expressed as exhaust hydrocarbon from petroleum--fueled engines. The atomic hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

* * * * *

§ 1039.805 What symbols, acronyms, and abbreviations does this part use?

* * * * *

ADD:
CH_4 methane

* * * * *

ADD:
N_2O nitrous oxide

* * * * *

§ 1039.810 DELETE.

§ 1039.815 What provisions apply to confidential information?

* * * * *

§ 1039.820 How do I request a hearing?

* * * * *

ADD:
§1039.825 What reporting and recordkeeping requirements apply under this part?

~~Under the Paperwork Reduction Act (44 U.S.C. 3501 et seq), the Office of Management and Budget approves the reporting and recordkeeping specified in the applicable regulations.~~ The following items illustrate the ~~kind of~~ reporting and recordkeeping we require for engines and equipment regulated under this part:

(a) We specify the following requirements related to engine certification in this §1039:

(1) In §1039.20 we require engine manufacturers to label stationary engines that do not meet the standards in this part.

(2) In §1039.135 we require engine manufacturers to keep certain records related to duplicate labels sent to equipment manufacturers.

(3) [Reserved]

(4) In subpart C of this part we identify a wide range of information required to certify engines.

(5) [Reserved]

(6) [Reserved]

(7) In subpart G of this part we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various special compliance provisions. For example, equipment manufacturers must submit reports and keep records related to the flexibility provisions in §1039.625.

(8) In §1039.725, 1039.730, and 1039.735 we specify certain records related to averaging, banking, and trading.

(b) We specify the following requirements related to testing in §1065:

(1) In §1065.2 we give an overview of principles for reporting information.

(2) In §1065.10 and 1065.12 we specify information needs for establishing various changes to published test procedures.

(3) In §1065.25 we establish basic guidelines for storing test information.

(4) In §1065.695 we identify data that may be appropriate for collecting during testing of in-use engines using portable analyzers.

(c) We specify the following requirements related to the general compliance provisions in §1068:

(1) In §1068.5 we establish a process for evaluating good engineering judgment related to testing and certification.

(2) In §1068.25 we describe general provisions related to sending and keeping information.

(3) In §1068.27 we require manufacturers to make engines available for our testing or inspection if we make such a request.

(4) In §1068.105 we require equipment manufacturers to keep certain records related to duplicate labels from engine manufacturers.

(5) In §1068.120 we specify recordkeeping related to rebuilding engines.

(6) In §1068, subpart C, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various exemptions.

(7) In §1068, subpart D, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to importing engines.

(8) In §1068.450 and 1068.455 we specify certain records related to testing production-line engines in a selective enforcement audit.

(9) In §1068.501 we specify certain records related to investigating and reporting emission-related defects.

(10) In §1068.525 and 1068.530 we specify certain records related to recalling nonconforming engines.

Appendix I to Part 1039 – Reserved

* * * * *

Appendix II to Part 1039 DELETE,
REPLACE WITH:
Appendix II to Part 1039 – Steady-state Duty Cycles ~~for Constant-Speed Engines~~

(a) The following duty cycles appl~~ies~~y for ~~discrete-mode testing of~~ constant-speed engines:

(1) The following duty cycle applies for discrete-mode testing:

D2 mode number	Engine speed [1]	Torque (percent) [21]	Weighting factors
1	~~Maximum Test Speed~~Engine governed	100	0.05
2	~~Maximum Test Speed~~Engine governed	75	0.25
3	~~Maximum Test Speed~~Engine governed	50	0.30
4	~~Maximum Test Speed~~Engine governed	25	0.30
5	~~Maximum Test Speed~~Engine governed	10	0.10

[1] ~~Maximum test speed is defined in §1065.~~
[2] ~~Except as noted in §1039.505, t~~ The percent torque is relative to maximum test torque.

~~(b)~~(2) The following duty cycle applies for ramped-modal testing ~~of constant speed engines~~:

RMC mode	Time in mode (seconds)	Engine speed	Torque (percent) [1,2]
1a Steady-state	53	Engine Governed	100
1b Transition	20	Engine Governed	Linear transition
2a Steady-state	101	Engine Governed	10
2b Transition	20	Engine Governed	Linear transition
3a Steady-state	277	Engine Governed	75
3b Transition	20	Engine Governed	Linear transition
4a Steady-state	339	Engine Governed	25
4b Transition	20	Engine Governed	Linear transition
5 Steady-state	350	Engine Governed	50

[1] The percent torque is relative to maximum test torque.
[2] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode.

(b) The following duty cycles apply for variable-speed engines with maximum engine power below 19 kW:

(1) The following duty cycle applies for discrete-mode testing:

G2 mode number	Engine speed [1]	~~Observed~~ Torque (percent) [2]	Weighting factors
1	Maximum test speed	100	0.09
2	Maximum test speed	75	0.20
3	Maximum test speed	50	0.29
4	Maximum test speed	25	0.30
5	Maximum test speed	10	0.07
6	Warm idle	0	0.05

[1] Speed terms are defined in §1065.
[2] ~~Except as noted in §1039.505, t~~The percent torque is relative to the maximum ~~test~~ torque at the commanded test speed.

(2) The following duty cycle applies for ramped-modal testing:

RMC mode	Time in mode (seconds)	Engine speed [1,3]	Torque (percent) [2,3]
1a Steady-state	41	Warm Idle	0
1b Transition	20	Linear transition	Linear transition
2a Steady-state	135	Maximum Test Speed	100
2b Transition	20	Maximum Test Speed	Linear transition
3a Steady-state	112	Maximum Test Speed	10
3b Transition	20	Maximum Test Speed	Linear transition
4a Steady-state	337	Maximum Test Speed	75
4b Transition	20	Maximum Test Speed	Linear transition
5a Steady-state	518	Maximum Test Speed	25
5b Transition	20	Maximum Test Speed	Linear transition
6a Steady-state	494	Maximum Test Speed	50
6b Transition	20	Linear transition	Linear transition
7 Steady-state	43	Warm Idle	0

[1] Speed terms are defined in §1065.
[2] The percent torque is relative to the maximum torque at the commanded engine speed.
[3] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode, and simultaneously command a similar linear progression for engine speed if there is a change in speed setting.

(c) The following duty cycles apply for variable-speed engines with maximum engine power at or above 19 kW:

(1) The following duty cycle applies for discrete-mode testing:

C1 mode number	Engine speed [1]	~~Observed~~ tTorque (percent) [2]	Weighting factors
1	Maximum test speed	100	0.15
2	Maximum test speed	75	0.15
3	Maximum test speed	50	0.15
4	Maximum test speed	10	0.10
5	Intermediate test	100	0.10
6	Intermediate test	75	0.10
7	Intermediate test	50	0.10
8	Warm Idle	0	0.15

[1] Speed terms are defined in §1065.
[2] The percent torque is relative to the maximum torque at the commanded test speed.

(2) The following duty cycle applies for ramped-modal testing:

RMC mode	Time in mode (seconds)	Engine speed [1,3]	Torque (percent) [2,3]
1a Steady-state	126	Warm Idle	0
1b Transition	20	Linear Transition [2]	Linear Transition
2a Steady-state	159	Intermediate Speed	100
2b Transition	20	Intermediate Speed	Linear Transition
3a Steady-state	160	Intermediate Speed	50
3b Transition	20	Intermediate Speed	Linear Transition
4a Steady-state	162	Intermediate Speed	75
4b Transition	20	Linear Transition	Linear Transition
5a Steady-state	246	Maximum Test Speed	100
5b Transition	20	Maximum Test Speed	Linear Transition
6a Steady-state	164	Maximum Test Speed	10
6b Transition	20	Maximum Test Speed	Linear Transition
7a Steady-state	248	Maximum Test Speed	75
7b Transition	20	Maximum Test Speed	Linear Transition
8a Steady-state	247	Maximum Test Speed	50
8b Transition	20	Linear Transition	Linear Transition
9 Steady-state	128	Warm Idle	0

[1] Speed terms are defined in 40 CFR part 1065.
[2] The percent torque is relative to the maximum torque at the commanded engine speed.
[3] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode, and simultaneously command a similar linear progression for engine speed if there is a change in speed setting.

Appendix III to Part 1039 DELETE.

Appendix IV to Part 1039 DELETE.

Appendix V to Part 1039 – [Reserved]

* * * * *

Appendix VI to Part 1039 – Nonroad Compression-Ignition Composite Transient Cycle

* * * * *