

State of California
Air Resources Board

**California Exhaust Emission Standards And Test Procedures For
New 2013 And Later Small Off-Road Engines**

Engine-Testing Procedures
(Part 1054)

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Amended:

January 1, 2023

Note: This document provides the entirety of the California Exhaust Emission Standards and Test Procedures for New 2013 and Later Small Off-Road Engines; Engine-Testing Procedures (Part 1054), as adopted by the California Air Resources Board (CARB) on December 16, 2011, with additional conforming modifications authorized under Resolution 11-41 on October 25, 2012, and amended on January 1, 2023. These standards and test procedures are incorporated by reference in Title 13, California Code of Regulations, § 2403. The Part 1054 section numbers, titles, and text correspond to same-numbered sections in Title 40 of the Code of Federal Regulations (CFR) Part 1054 – Control of Emissions from New, Small Nonroad Spark-Ignition Engines and Equipment, with California-specific modifications as necessary to maintain the stringency of California emission standards and provide consistency with other California regulations. CFR sections that are not listed herein are not a part of this Part 1054. The 2011/2012 CARB rulemaking incorporated by reference portions of Title 40 CFR Part 1054, including Subparts A through I, as amended November 8, 2010; for clarity, the 2021 CARB rulemaking included the entirety of the language from those portions of Title 40 CFR Part 1054, including Subparts A through I, incorporated by reference in Part 1054 from the 2011/2012 rulemaking into Part 1054. The 2011/2012 CARB rulemaking also incorporated by reference the internally referenced sections in Part 1054 of Title 40 CFR Part 90 as amended October 30, 2009, Title 40 CFR Part 1051 as amended April 30, 2010, Title 40 CFR Part 1060 as amended September 16, 2010, Title 40 CFR Part 1065 as amended November 8, 2010, and Title 40 CFR Part 1068 as amended April 30, 2010. The 2021 CARB rulemaking included those portions of Title 40 CFR Part 1054 Subparts A, B, C, and I, as amended between November 8, 2010, and June 29, 2021, in Part 1054. The 2021 CARB rulemaking incorporated by reference the internally referenced sections in Part 1054 to Title 40 CFR Part 1051 as amended June 29, 2021, and Part 1068 as amended June 29, 2021. The 2021 CARB rulemaking removed the references to 40 CFR Parts 90, 1054, 1060, and 1065, and those CFR Parts are no longer incorporated by reference in this Part 1054. 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, the Health and Safety Code and Title 13 apply.

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California Exhaust Emission Standards and Test Procedures for New 2013 and Later Small Off-Road Engines

Part 1054 – Control of Emission from New, Small Nonroad Spark-Ignition Engines and Equipment

Subpart A—Overview and Applicability

§ 1054.1 Does this part apply for my engines and equipment?

(a) Except as provided in § 1054.5, the regulations in this part 1054 apply as follows:

(1) The requirements of this part related to exhaust emissions apply to new, spark-ignition engines with maximum engine power at or below 19 kW. This includes auxiliary marine spark-ignition engines.

(2) The requirements of this part related to evaporative emissions apply as specified in Title 13, California Code of Regulations, Chapter 15, Article 1 to fuel systems used with engines subject to exhaust emission standards in this part if the engines use a volatile liquid fuel (such as gasoline).

(3) This part 1054 applies starting with the 2013 model year for all small spark-ignition off-road engines and equipment.

(4) The provisions of Title 13, California Code of Regulations, section 2403(f) currently apply for new engines used in emergency rescue equipment.

(b) [Reserved]

(c) See California Exhaust Emission Standards and Test Procedures for 2005 – 2012 Small Off-Road Engines for requirements that apply to engines not yet subject to the requirements of this part 1054.

§ 1054.2 Who is responsible for compliance?

(a) The requirements and prohibitions of this part apply to manufacturers of engines and equipment, as described in §1054.1. The requirements of this part are generally addressed to manufacturers subject to this part's requirements. The term “you” generally means the certifying manufacturer. For provisions related to exhaust emissions, this generally means the engine manufacturer, especially for issues related to certification (including production-line testing, reporting, etc.). For provisions related to certification with respect to evaporative emissions, this generally means the equipment manufacturer (i.e., the Executive Order Holder, as defined in Title 13, California Code of Regulations, section 2752).

(b) Equipment manufacturers must meet applicable requirements as described in Title 13, California Code of Regulations, Chapter 15, Article 1. Engine manufacturers that assemble an engine's complete fuel system are considered to be the equipment manufacturer with respect to evaporative emissions.

§ 1054.5 Which nonroad engines are excluded from this part's requirements?

This part does not apply to the engines that are excluded in the “small off-road engine” definition found in Title 13, California Code of Regulations, section 2401.

§ 1054.10 How is this part organized?

This part 1054 is divided into the following subparts:

- (a) Subpart A of this part defines the applicability of this part 1054 and gives an overview of regulatory requirements.
- (b) Subpart B of this part describes the emission standards and other requirements that must be met to certify engines under this part. Note that § 1054.145 discusses certain interim requirements and compliance provisions that apply only for a limited time.
- (c) Subpart C of this part describes how to apply for an Executive Order.
- (d) Subpart D of this part describes general provisions for testing production-line engines.
- (e) Subpart E of this part describes general provisions for testing in-use engines.
- (f) Subpart F of this part describes how to test your engines (including references to other parts of the California Code of Regulations and specific sections, which are incorporated by reference, of the Code of Federal Regulations).
- (g) Subpart G of this part and sections of Title 40, Code of Federal Regulations part 1068 as amended June 29, 2021, which are incorporated by reference, describe requirements, prohibitions, and other provisions that apply to engine manufacturers, equipment manufacturers, owners, operators, rebuilders, and all others.
- (h) Subpart H of this part describes how you may generate and use exhaust and evaporative emission credits to certify your engines and equipment.
- (i) Subpart I of this part contains definitions and other reference information.

§ 1054.15 Do any other parts apply to me?

(a) [Reserved]

(b) The “California Exhaust Emission Standards and Test Procedures for New 2013 Small Off-Road Engines; Engine-Testing Procedures (Part 1065),” adopted October 25, 2012, and amended January 1, 2023, hereinafter referred to as Part 1065, describes procedures and equipment specifications for testing engines to measure exhaust emissions. Subpart F of this part 1054 describes how to apply the provisions of Part 1065 to determine whether engines meet the exhaust emission standards in this part.

(c) [Reserved]

(d) Other parts of this chapter apply if referenced in this part.

§ 1054.20 What requirements apply to my equipment?

(a) If you manufacture equipment using engines certified under this part, your equipment must meet all applicable emission standards with the engine and fuel system installed.

(b) All equipment subject to the exhaust standards of Title 13, California Code of Regulations, Chapter 9, Article 1, must also meet the evaporative emission standards of Title 13, California Code of Regulations, Chapter 15, Article 1.

(c) You must identify and label equipment you produce under this part 1054 consistent with the requirements of Title 13, California Code of Regulations, Chapter 9, Article 1, Section 2404 and Chapter 15, Article 1, Section 2759.

(d) You must certify your evaporative emission control systems as described in Title 13, California Code of Regulations, Chapter 15, Article 1.

(e) You must follow all emission-related installation instructions from the certifying manufacturers as described in §1054.130, and Title 13, California Code of Regulations, Chapters 9 and 15. Failure to follow these instructions may subject you to civil penalties.

§ 1054.30 Submission of information.

Unless we specify otherwise, send all reports and requests for approval to the Designated Compliance Officer (see § 1054.801). See § 1054.825 for additional reporting and recordkeeping provisions.

Subpart B – Emission Standards and Related Requirements

§ 1054.101 What emission standards and requirements must my engines meet?

(a)(1) *Exhaust emissions.* All engines must meet the requirements in §1054.115. Exhaust emission standards are specified in Title 13, California Code of Regulations, Chapter 9, Article 1.

(b) *Evaporative emissions.* Except as specified in §1054.20, new equipment using engines that run on a volatile liquid fuel (such as gasoline) must meet the evaporative emission requirements as specified in Title 13, California Code of Regulations, Chapter 15, Article 1.

(c-e) [Reserved]

(f) *Interim provisions.* It is important that you read § 1054.145 to determine if there are other interim requirements or interim compliance provisions that apply for a limited time.

§ 1054.103 What exhaust emission standards must my handheld engines meet?

(a) *Emission standards.* The exhaust emissions from your engines may not exceed the emission standards that are specified in §1054.101. Measure emissions using the applicable steady-state test procedures described in subpart F of this part.

(b) *Averaging, banking, and trading.* You may generate or use emission credits under the averaging, banking, and trading (ABT) program for HC+NO_x emissions and Particulate Matter emissions as described in Title 13, California Code of Regulations, Chapter 9, Article 1.

(c) *Fuel types.* The exhaust emission standards in this section apply for engines using the fuel type on which the engines in the emission family are designed to operate. You must meet the numerical emission standards for hydrocarbon in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Alcohol-fueled engines: THCE emissions.

(2) Natural gas-fueled engines: NMHC emissions.

(3) Other engines: THC emissions.

(d) *Useful life.* Your engines must meet the exhaust emission standards in paragraph (a) of this section over their full useful life as described in § 1054.107.

(e) *Applicability for testing.* The emission standards in Title 13, California Code of Regulations, Chapter 9, Article 1 apply to all testing, including certification, production-line, in-use, and new engine compliance testing.

§ 1054.105 What exhaust emission standards must my nonhandheld engines meet?

(a) *Emission standards.* Exhaust emissions from your engines may not exceed the emission standards that are specified in §1054.101. Measure emissions using the applicable steady-state test procedures described in subpart F of this part.

(b) *Averaging, banking, and trading.* You may generate or use emission credits under the averaging, banking, and trading (ABT) program for HC+NO_x emissions and Particulate Matter emissions as described in Title 13, California Code of Regulations, Chapter 9, Article 1.

(c) *Fuel types.* The exhaust emission standards in this section apply for engines using the fuel type on which the engines in the emission family are designed to operate. You must meet the numerical emission standards for hydrocarbon in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Alcohol-fueled engines: THCE emissions.

(2) Natural gas-fueled engines: NMHC emissions.

(3) Other engines: THC emissions.

(d) *Useful life.* Your engines must meet the exhaust emission standards in paragraph (a) of this section over their full useful life as described in § 1054.107.

(e) *Applicability for testing.* The emission standards in Title 13, California Code of Regulations, Chapter 9, Article 1 apply to all testing, including certification, production-line, in-use, and new engine compliance testing.

§ 1054.107 What is the useful life period for meeting exhaust emission standards?

This section describes an engine family's useful life, which is the period during which engines are required to comply with all emission standards that apply. The useful life period is a number of hours of operation, as described in this section.

(a)(1) For model years 2013 through 2023, the useful life period for exhaust requirements is the number of engine operating hours from Title 13, California Code of Regulations, Chapter 9, Article 1, Section 2404 that most closely matches the expected median in-use life of your engines. The median in-use life of your engine is the shorter of the following values:

(i) The median in-use life of equipment into which the engine is expected to be installed.

(ii) The median in-use life of the engine without being scrapped or rebuilt.

(2) For model year 2024 and later engines, the useful life period for exhaust requirements is specified in the table in Title 13, California Code of Regulations, section 2403(b)(1).

(3) You may select a longer useful life than that specified in paragraph (a)(1) or (a)(2) of this section as applicable in 100-hour increments not to exceed 3,000 hours for Class I, III, IV, and V engines, or 5,000 hours for Class II engines. Engine classes are defined in Title 13, California Code of Regulations, section 2403. For engine families generating emission credits, you may do this only with our approval.

(b) Keep any available information to support your selection and make it available to us if we ask for it. We may require you to certify to a different useful life value from the table if we determine that the selected useful life value is not justified by the data. We may consider any

relevant information, including your product warranty statements and marketing materials regarding engine life, in making this determination. We may void your Executive Order if we determine that you intentionally selected an incorrect value. Support your selection based on any of the following information:

- (1) Surveys of the life spans of the equipment in which the subject engines are installed.
- (2) Engineering evaluations of field aged engines to ascertain when engine performance deteriorates to the point where usefulness and/or reliability is impacted to a degree sufficient to necessitate overhaul or replacement.
- (3) Failure reports from engine customers.
- (4) Engineering evaluations of the durability, in hours, of specific engine technologies, engine materials, or engine designs.

§ 1054.110 What evaporative emission standards must my handheld equipment meet?

All equipment must meet the evaporative emission requirements as specified in Title 13, California Code of Regulations, Chapter 15, Article 1. The evaporative emission requirements apply for handheld equipment over a useful life of five years.

§ 1054.112 What evaporative emission standards must my nonhandheld equipment meet?

All equipment must meet the evaporative emission requirements as specified in Title 13, California Code of Regulations, Chapter 15, Article 1. The evaporative emission requirements apply for nonhandheld equipment over a useful life of five years.

§ 1054.115 What other requirements apply?

The following requirements apply with respect to engines that are required to meet the emission standards of this part:

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

(1) Snowthrower engines 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. If you take advantage of this exception, you must do the following things:

(i) Manufacture the engines so that all crankcase emissions can be routed into the applicable sampling systems specified in Part 1065.

(ii) Account for deterioration in crankcase emissions when determining exhaust deterioration factors.

(2) For purposes of this paragraph (a), 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.

(b) *Adjustable parameters.* Engines that have adjustable parameters must meet all the requirements of this part for any adjustment in the physically adjustable range. An operating

parameter is not considered adjustable if you permanently seal it. Operating parameters that can be adjusted using tools are considered adjustable. We may require that you set adjustable parameters to any specification within the adjustable ranges during any testing including certification testing, production-line testing, in-use testing, or new engine compliance testing.

(c) *Altitude adjustments.* Engines must meet applicable emission standards for valid tests conducted under the ambient conditions specified in Part 1065.520. Engines must meet applicable emission standards at all specified atmospheric pressures except: (i) handheld engines for atmospheric pressures below 96.0 kPa; and, (ii) nonhandheld engines may rely on an altitude kit for atmospheric pressures below 94.0 kPa if you meet the requirements specified in section 1054.205(r). If you rely on an altitude kit for certification, you must identify in the owner's manual the altitude range for which you expect proper engine performance and emission control with and without the altitude kit; you must also state in the owner's manual that operating the engine with the wrong engine configuration at a given altitude may increase its emissions and decrease fuel efficiency and performance. In your application for certification, identify the altitude above which you rely on an altitude kit to meet emission standards and describe your plan for making information and parts available such that you would reasonably expect that altitude kits would be widely used at all such altitudes.

(d) *Prohibited controls.* You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

(e) *Defeat devices.* You may not equip your engines with a defeat device. A defeat device is an auxiliary emission control device that reduces the effectiveness of emission controls under conditions that the engine may reasonably be expected to encounter during normal operation and use. This does not apply for altitude kits installed or removed consistent with § 1054.655. This also does not apply to auxiliary emission control devices you identify in your application for certification if any of the following is true:

(1) The conditions of concern were substantially included in the applicable duty-cycle test procedures described in subpart F of this part.

(2) You show your design is necessary to prevent engine (or equipment) damage or accidents.

(3) The reduced effectiveness applies only to starting the engine.

§ 1054.120 What emission-related warranty requirements apply to me?

The requirements of this section and Title 13, California Code of Regulations, Chapter 9, Article 1 apply to the manufacturer certifying with respect to exhaust emissions. See Title 13, California Code of Regulations, Chapter 15, Article 1 for the warranty requirements related to evaporative emissions.

(a) *General requirements.* You must warrant to the ultimate purchaser and each subsequent purchaser that the new engine, including all parts of its emission control system, meets two conditions:

(1) It is designed, built, and equipped so it conforms at the time of sale to the ultimate purchaser with the requirements of this part.

(2) It is free from defects in materials and workmanship that may keep it from meeting these requirements.

(b) *Warranty period.* Your emission-related warranty must be valid during the periods specified in this paragraph (b). You may offer an emission-related warranty more generous than we require. The emission-related warranty for the engine may not be shorter than any published warranty you offer without charge for the engine. Similarly, the emission-related warranty for any component may not be shorter than any published warranty you offer without charge for that component. If an engine has no hour meter, we base the warranty periods in this paragraph (b) only on the engine's age (in years). The warranty period begins on the date of sale to the ultimate purchaser. The minimum warranty periods are as follows:

(1) The minimum warranty period is two years.

(c) *Components covered.* The emission-related warranty covers all components whose failure would increase an engine's emissions of any regulated pollutant, including components listed in Title 13, California Code of Regulations, Chapters 9 and 15, and components from any other system you develop to control emissions. The emission-related warranty covers these components even if another company produces the component. Your emission-related warranty does not cover components whose failure would not increase an engine's emissions of any regulated pollutant.

(d) [Reserved]

(e) *Owner's manual.* Describe in the owner's manual the emission-related warranty provisions from this section that apply to the engine. Include instructions for obtaining warranty service consistent with the requirements of paragraph (f) of this section.

(f) *Requirements related to warranty claims.* You are required at a minimum to meet the following conditions to ensure that owners will be able to promptly obtain warranty repairs:

(1) You must provide and monitor a toll-free telephone number and an e-mail address for owners to receive information about how to make a warranty claim, and how to make arrangements for authorized repairs.

(2) You must provide a source of replacement parts within the United States. For parts that you import, this requires you to have at least one distributor within the United States.

(3) You must use one of the following methods to show that you will generally be able to honor warranty claims:

(i) If you have authorized service centers in all California population centers with a population of 100,000 or more based on the 2010 census, you may limit warranty repairs to these service providers.

(ii) You may limit warranty repairs to authorized service centers for owners located within 100 miles of an authorized service center. For owners located more than 100 miles from an authorized service center, you must state in your warranty that you will either pay for shipping costs to and from an authorized service center, provide for a service technician to come to the owner to make the warranty repair, or pay for the repair to be made at a local non-authorized service center.

(iii) You must have at least one authorized service center in California.

§ 1054.125 What maintenance instructions must I give to buyers?

Give the ultimate purchaser of each new engine written instructions for properly maintaining and using the engine, including the emission control system as described in this section. The maintenance instructions also apply to service accumulation on your emission-data engines as described in §1054.245 and in Part 1065.

(a) *Critical emission-related maintenance.* Critical emission-related maintenance includes any adjustment, cleaning, repair, or replacement of critical emission-related components. This may also include additional emission-related maintenance that you determine is critical if we approve it in advance. You may schedule critical emission-related maintenance on these components if you meet the following conditions:

(1) You demonstrate that the maintenance is reasonably likely to be done at the recommended intervals on in-use engines. We will accept scheduled maintenance as reasonably likely to occur if you satisfy any of the following conditions:

(i) You present data showing that any lack of maintenance that increases emissions also unacceptably degrades the engine's performance.

(ii) You present survey data showing that at least 80 percent of engines in the field get the maintenance you specify at the recommended intervals. If the survey data show that 60 to 80 percent of engines in the field get the maintenance you specify at the recommended intervals, you may ask us to consider additional factors such as the effect on performance and emissions. For example, we may allow you to schedule fuel-injector replacement as critical emission-related maintenance if you have survey data showing this is done at the recommended interval for 65 percent of engines and you demonstrate that performance degradation is roughly proportional to the degradation in emission control for engines that do not have their fuel injectors replaced.

(iii) You provide the maintenance free of charge and clearly say so in your maintenance instructions.

(iv) You otherwise show us that the maintenance is reasonably likely to be done at the recommended intervals.

(2) You may schedule cleaning or changing air filters or changing spark plugs at the least frequent interval described in the owner's manual. See § 1054.245 for testing requirements related to these maintenance steps.

(3) You may not schedule critical emission-related maintenance within the useful life period for aftertreatment devices, pulse-air valves, fuel injectors, oxygen sensors, electronic control units, superchargers, or turbochargers, except as specified in paragraph (b) or (c) of this section.

(4) You may ask us to approve a maintenance interval shorter than that specified in paragraph (a)(3) of this section. 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.

(b) *Recommended additional maintenance.* You may recommend any additional amount of maintenance on the components listed in paragraph (a) of this section, as long as you state clearly that these maintenance steps are not necessary to keep the emission-related warranty valid. If operators do the maintenance specified in paragraph (a) of this section, but not the recommended additional maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim. Do not take these maintenance steps during service accumulation on your emission-data engines.

(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. You may also address maintenance of low-use engines (such as recreational or stand-by engines) by specifying the maintenance interval in terms of calendar months or years in addition to your specifications in terms of engine operating hours. All special maintenance instructions must be consistent with good engineering judgment. 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. For example, this paragraph (c) does not allow you to design engines that require special maintenance for a certain type of expected operation. 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) *Noncritical emission-related maintenance.* 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 (i.e., 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 re-seating valves, removing combustion chamber deposits, or any other emission-related maintenance on the components we specify in Title 13, California Code of Regulations, Chapters 9 and 15 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. Do not take these inspection or maintenance steps during service accumulation on your emission-data engines.

(e) *Maintenance that is not emission-related.* For maintenance unrelated to emission controls, you may schedule any amount of inspection or maintenance. You may also take these inspection or maintenance steps during service accumulation on your emission-data engines, as long as they are reasonable and technologically necessary. This might include adding engine oil, changing fuel or oil filters, servicing engine-cooling systems, and adjusting idle speed, governor, engine bolt torque, valve lash, or injector lash. You may not perform this nonemission-related maintenance on emission-data engines more often than the least frequent intervals that you recommend to the ultimate purchaser.

(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 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) for a component or service if you do one of two things:

(1) Provide the 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) *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 it meets all the following criteria:

(1) Each affected component was not in general use on similar engines before 1997.

(2) The primary function of each affected component is to reduce emissions.

(3) Failure to perform the maintenance would not cause clear problems that would significantly degrade the engine's performance.

(h) *Owner's manual.* Explain the owner's responsibility for proper maintenance in the owner's manual.

§ 1054.130 What installation instructions must I give to equipment manufacturers?

(a) If you sell an engine for someone else to install in a piece of equipment, give the engine installer instructions for installing it consistent with the requirements of this part. Include all information necessary to ensure that an engine will be installed in its certified configuration.

(b) Make sure the instructions have the following information:

(1) Include the heading: "Emission-related installation instructions".

(2) State: "Failing to follow these instructions when installing a certified engine in off-road equipment violates California law, subject to penalties as described in Title 13, California Code of Regulations."

(3) Describe the instructions needed to properly install the exhaust system and any other components. Include instructions consistent with the requirements of § 1054.655 related to altitude kits.

(4) Describe the steps needed to control evaporative emissions in accordance with the Executive Order that you hold. Include instructions for connecting fuel lines as needed to prevent running loss emissions, if applicable. Such instructions must include sufficient detail to ensure that running loss control will not cause the engine to exceed exhaust emission standards. For example, you may specify a maximum vapor flow rate under normal operating conditions. Also include notification that the installer must meet the requirements of §1054.112 and Title 13, California Code of Regulations, Chapter 15, Article 1.

(5) Describe how your certification is limited for any type of application. For example, if you certify engines only for rated-speed applications, tell equipment manufacturers that the engine must not be installed in equipment involving intermediate-speed operation. Also, if your wintertime engines are not certified to the otherwise applicable HC+NO_x standards in this subpart, tell equipment manufacturers that the engines must be installed in equipment that is used only in wintertime.

(6) Describe any other instructions to make sure the installed engine will operate according to design specifications in your application for certification. For example, this may include specified limits for catalyst systems, such as exhaust backpressure, catalyst location, and temperature profiles during engine operation.

(7) State: "If you install the engine in a way that makes the engine's emission control information label hard to read during normal engine maintenance, you must place a duplicate label on the equipment, as described in Title 13, California Code of Regulations, Chapter 9, Article 1, Section 2404."

(c) You do not need installation instructions for engines you install in your own equipment.

(d) Provide instructions in writing or in an equivalent format. For example, you may post instructions on a publicly available Web site for downloading or printing. If you do not provide the instructions in writing, explain in your application for certification how you will ensure that each installer is informed of the installation requirements.

§ 1054.135 How must I label and identify the engines I produce?

The label shall meet the requirements specified in Section 2404, Title 13 of the California Code of Regulations.

§ 1054.140 What is my engine's maximum engine power and displacement?

This section describes how to quantify your engine's maximum engine power and displacement for the purposes of this part.

(a) An engine configuration's maximum engine power is the maximum brake power point on the nominal power curve for the engine configuration, as defined in this section. Round the power value to the nearest 0.1 kilowatts for nonhandheld engines and to the nearest 0.01 kilowatts for handheld engines. The nominal power curve of an engine configuration is

the relationship between maximum available engine brake power and engine speed for an engine, using the mapping procedures of Part 1065, based on the manufacturer's design and production specifications for the engine. For handheld engines, we may allow manufacturers to base the nominal power curve on other mapping procedures. This information may also be expressed by a torque curve that relates maximum available engine torque with engine speed. Note that maximum engine power is based on engines and installed engine governors; equipment designs that further limit engine operation do not change maximum engine power.

(b) An engine configuration's displacement is the intended swept volume of all the engine's cylinders. The swept volume of the engine is the product of the internal cross-section area of the cylinders, the stroke length, and the number of cylinders. Calculate the engine's intended swept volume from the design specifications for the cylinders using enough significant figures to allow determination of the displacement to the nearest 0.1 cc. Determine the final value by rounding to the nearest cubic centimeter. For example, for a one-cylinder engine with circular cylinders having an internal diameter of 6.00 cm and a 6.25 cm stroke length, the rounded displacement would be: $(1) \times (6.00/2)^2 \times (\pi) \times (6.25) = 177 \text{ cc}$.

(c) The nominal power curve and intended swept volume must be within the range of the actual power curves and swept volumes of production engines considering normal production variability. If after production begins it is determined that either your nominal power curve or your intended swept volume does not represent production engines, we may require you to amend your application for certification under § 1054.225.

§ 1054.145 Are there interim provisions that apply only for a limited time?

The interim provisions in this section apply instead of other provisions in this part. This section describes how and when these interim provisions apply.

(a-i) [Reserved]

(j) *Continued use of California Exhaust Emission Standards and Test Procedures for 2005 through 2012 Small Off-Road Engines.* You may use the test procedures for measuring exhaust emissions in the California Exhaust Emission Standards and Test Procedures for 2005 through 2012 Small Off-Road Engines instead of those in subpart F of this part for the 2013 through 2014 model years. This applies for certification, production-line, and in-use testing. You may continue to use data based on the test procedures in the California Exhaust Emission Standards and Test Procedures for 2005 through 2012 Small Off-Road Engines for engine families in 2014 and later model years, provided that we allow you to use carryover emission data under section 1054.235(d) for your engine family. You may also use the test procedures for measuring exhaust emissions in the California Exhaust Emission Standards and Test Procedures for 2005 to 2012 Small Off-Road Engines for production-line testing with any engine family whose certification is based on testing with those procedures.

(k-o) [Reserved]

Subpart C—Certifying Emission Families

§ 1054.201 What are the general requirements for obtaining an Executive Order?

Engine manufacturers must certify their engines with respect to the exhaust emission standards in Title 13, California Code of Regulations, Chapter 9, Article 1, Section 2403. Manufacturers of engines, equipment, or fuel-system components may need to certify their products with respect to evaporative emission standards as described in Title 13, California Code of Regulations, Chapter 15, Article 1. The following general requirements apply for obtaining an Executive Order:

- (a) You must send us a separate application for an Executive Order for each engine family. An Executive Order is not valid for any production after December 31 of the model year for which it is issued. If you certify with respect to both exhaust and evaporative emissions, you must submit separate applications.
- (b) The application must contain all the information required by this part and must not include false or incomplete statements or information (see § 1054.255).
- (c) We may ask you to include less information than we specify in this subpart as long as you maintain all the information required by § 1054.250.
- (d) [Reserved]
- (e) An authorized representative of your company must approve and sign the application.
- (f) See § 1054.255 for provisions describing how we will process your application.
- (g) We may require you to deliver your test engines to a facility we designate for our testing (see § 1054.235(c)).
- (h) [Reserved]
- (i) The Executive Officer may request notification, prior to the initial model year submission of an engine manufacturer's certification application(s), of the engine manufacturer's intent to seek engine family certification (i.e., a letter of intent) so that the Executive Officer can adequately allocate resources required for reviewing such certification applications in a timely manner. Such letters of intent must provide the engine manufacturer's best estimate of general information for the applicable model-year certification, such as identification of each engine family, date of expected submission, etc.

§ 1054.205 What must I include in my application?

This section specifies the information that must be in your application, unless we ask you to include less information under §1054.201(c). We may require you to provide additional information to evaluate your application. The provisions of this section apply to the manufacturer that is to be granted an Executive Order.

- (a) Describe the engine family's specifications and other basic parameters of the engine's design and emission controls (i.e., catalyst specifications). List the fuel type on which your engines are designed to operate (for example, all-season gasoline). List each distinguishable engine configuration in the engine family.

(b) Explain how the emission control systems operate. Describe the evaporative emission controls and show how your design will prevent running loss emissions, if applicable. Also describe in detail all system components for controlling exhaust emissions, including all auxiliary emission control devices (AECDs) and all fuel-system components you will install on any production or test engine. Identify the part number of each component you describe. For this paragraph (b), treat as separate AECDs any devices that modulate or activate differently from each other. Include sufficient detail to allow us to evaluate whether the AECDs are consistent with the defeat device prohibition of § 1054.115. For example, if your engines will routinely experience in-use operation that differs from the specified duty cycle for certification, describe how the fuel-metering system responds to varying speeds and loads not represented by the duty cycle. If you test an emission-data engine by disabling the governor for full-load operation such that the engine operates at an air-fuel ratio significantly different than under full-load operation with an installed governor, explain why these differences are necessary or appropriate. For conventional carbureted engines without electronic fuel controls, it is sufficient to state that there is no significant difference in air-fuel ratios.

(c) [Reserved]

(d) Describe the engines, equipment, and fuel system components you selected for testing and the reasons for selecting them.

(e) Describe the test equipment and procedures that you used, including any special or alternate test procedures you used. For handheld engines, describe how you selected the value for rated speed.

(f) Describe how you operated the emission-data engine before testing, including the duty cycle and the number of engine operating hours used to stabilize emission levels. Explain why you selected the method of service accumulation. Describe any scheduled maintenance you did.

(g) List the specifications of the test fuel to show that it falls within the required ranges we specify in Part 1065.

(h) Identify the emission family's useful life. Describe the basis for selecting useful life values with respect to exhaust emissions (see § 1054.107).

(i) Include the maintenance and warranty instructions you will give to the ultimate purchaser of each new engine (see §§1054.120 and 1054.125). Describe your basis for meeting the warranty-assurance provisions in §1054.120(f). Describe your recall repair network if it is different than your warranty repair network.

(j) Include the emission-related installation instructions you will provide if someone else installs your engines in nonroad equipment (see § 1054.130).

(k) Describe your emission control information label (see § 1054.135).

(l) Identify the emission standards or FELs for the engine family. Include a statement indicating whether the manufacturer intends to include the engine family in a corporate average, and, if so, an estimate of the overall corporate average emissions for that model year.

(m) Identify the emission family's deterioration factors and describe how you developed them (see § 1054.245). Present any emission test data you used for this.

(n) State that you operated your emission-data engines as described in the application (including the test procedures, test parameters, and test fuels) to show you meet the requirements of this part.

(o) Present emission data to show that you meet exhaust emission standards, as follows:

(1) Present emission data for hydrocarbons (such as THC, THCE, or NMHC, as applicable), NO_x, and CO on an emission-data engine to show your engines meet the applicable exhaust emission standards as specified in § 1054.101. Show emission figures before and after applying deterioration factors for each engine. Include test data from each applicable duty cycle specified in § 1054.505(b). If we specify more than one grade of any fuel type (for example, low-temperature and all-season gasoline), you need to submit test data only for one grade, unless the regulations of this part specify otherwise for your engine.

(2) Note that §§ 1054.235 and 1054.245 allow you to submit an application in certain cases without new emission data.

(p) Report test results as follows:

(1) Report all valid test results involving measurement of pollutants for which emission standards apply. Also indicate whether there are test results from invalid tests or from any other tests of the emission-data engine, whether or not they were conducted according to the test procedures of subpart F of this part. We may require you to report these additional test results. We may ask you to send other information to confirm that your tests were valid under the requirements of this part; Title 13, California Code of Regulations, Chapters 9 and 15; and Part 1065.

(2) Report measured CO₂, N₂O, and CH₄ as described in §1054.235.

(q) Describe all adjustable operating parameters (see § 1054.115(b)), including production tolerances. Include the following in your description of each parameter:

(1) The nominal or recommended setting.

(2) The intended physically adjustable range.

(3) The limits or stops used to establish adjustable ranges.

(4) Information showing why the limits, stops, or other means of inhibiting adjustment are effective in preventing adjustment of parameters on in-use engines to settings outside your intended physically adjustable ranges.

(5) Information including but not limited to part numbers, technical specifications, schematics, and photographs of physical samples.

(r) Describe how your nonhandheld engines comply with emission standards at varying atmospheric pressures. Include a description of altitude kits you designed to comply with the requirements of §1054.115(c). Identify the part number of each component you describe. Identify the altitude range for which you expect proper engine performance and emission control with and without the altitude kit. State that your engines will comply with applicable emission standards throughout the useful life with the altitude kit installed according to your instructions. Describe any relevant testing, engineering analysis, or other information in sufficient detail to support your statement. In addition, describe your plan for making information and parts available such that you would reasonably expect that altitude kits would be widely used in the high-altitude counties. For example, engine owners should have ready access to information describing when an altitude kit is needed and how to obtain this service. Similarly, parts and service information should be available to qualified service facilities in addition to authorized service centers if that is needed for owners to have such altitude kits installed locally.

(s) If your engines are subject to any handheld engine provisions on the basis of meeting the definition of "handheld" in Title 13, California Code of Regulations, section 2401, describe your analysis showing that you meet the applicable criteria.

(t) 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 wintertime engines not certified to the specified HC+NO_x standard.

(u) Unconditionally certify that all the engines in the engine family comply with the requirements of this part, other referenced parts of the CFR as incorporated and modified herein, California's Health and Safety Code, and Title 13, California Code of Regulations, §§ 2400-2409.

(v) Provide the following information about your plans for producing and selling engines:

(1) Identify the estimated initial and final dates for producing engines from the engine family for the model year.

(2) Identify the estimated date for initially introducing certified engines into commerce in California under this Executive Order.

(3) Include good-faith estimates of 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. Also indicate whether you expect the engine family to contain only off-road engines, only stationary engines, or both. If your estimates are based on U.S.-directed production volumes, include U.S.-directed production volumes and information or analysis that provides the basis for determining your estimates of California-directed production volumes.

(w) [Reserved]

(x) Include the information required by other subparts of this part.

(y) Include other applicable information, such as information specified in this part related to requests for exemptions.

(z) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by CARB or otherwise by the State of California related to the requirements of this part.

(aa) For imported engines or equipment, identify the following:

(1) The port(s) at which you have imported your engines (or equipment containing your engines) over the previous 12 months.

(2) The names and addresses of the agents you have authorized to import your engines or equipment.

(3) The location of a test facility in the United States where you can test your engines if we select them for compliance testing as specified in Title 13, California Code of Regulations, § 2407.

§ 1054.220 How do I amend my maintenance instructions?

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 § 1054.125. You must send the Designated Compliance Officer 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. 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 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 at any time after you send your request. For example, this paragraph (b) would cover adding instructions to increase the frequency of 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).

§ 1054.225 How do I amend my application for certification?

Before we issue you an Executive Order, you may amend your application to include new or modified engine or fuel-system configurations, subject to the provisions of this section. After we have issued your Executive Order, you may send us an amended application requesting that we include new or modified configurations within the scope of the Executive Order,

subject to the provisions of this section. You must amend your application if any changes occur with respect to any information included in your application.

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

(1) Add an engine or fuel-system configuration to an emission family. In this case, the configuration added must be consistent with other configurations in the emission family with respect to the criteria listed in § 1054.230.

(2) Change a configuration already included in an emission 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.

(b) To amend your application for certification, send the following relevant information to the Designated Compliance Officer:

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

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

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

(4) Include any other information needed to make your application correct and complete.

(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 emission families already covered by an Executive Order, we will determine whether the existing Executive Order covers your new or modified configuration. You may ask for a hearing if we deny your request (see § 1054.820).

(e) For emission families already covered by an Executive Order, you may start producing the new or modified configuration at 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 configurations do not meet applicable requirements, we will notify you to cease production of the configurations and may require you to recall the engine or equipment at no expense to the owner. Choosing to produce engines under this paragraph (e) is deemed to be consent to recall all engines or equipment 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 engine or equipment.

§ 1054.230 How do I select emission families?

(a) For purposes of certification, divide your product line into families of engines that are expected to have similar emission characteristics throughout their useful life as described in this section. Your engine family is limited to a single model year. For evaporative emissions, group engines into emission families as described in Title 13, California Code of Regulations, Chapter 15, Article 1.

(b) Group engines into the same emission family for exhaust emissions if they are the same in all the following aspects:

(1) The combustion cycle and fuel. See paragraph (g) of this section for special provisions that apply for dual-fuel engines.

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

(3) Valve configuration (for example, side-valve vs. overhead valve).

(4) Method of air aspiration (for example, turbocharged vs. naturally aspirated).

(5) The number, location, volume, and composition of catalytic converters.

(6) The number and arrangement of cylinders (such as in-line or vee configuration) and approximate total displacement.

(7) Engine class, as defined in Title 13, California Code of Regulations, § 2403.

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

(9) The numerical level of the applicable emission standards. For example, an engine family may not include engines certified to different family emission limits, though you may change family emission limits without recertifying as specified in § 1054.225.

(10) Useful life.

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

(d) [Reserved]

(e) Select test engines from the emission family as described in Part 1065.401.

(f) [Reserved]

(g) You may certify dual-fuel or flexible-fuel engines in a single engine family. You may include dedicated-fuel versions of this same engine model in the same engine family, as long as they are identical to the engine configuration with respect to that fuel type for the dual-fuel or flexible-fuel version of the engine. For example, if you produce an engine that can alternately run on gasoline and natural gas, you can include the gasoline-only and natural gas-only

versions of the engine in the same engine family as the dual-fuel engine if engine operation on each fuel type is identical with or without installation of components for operating on the other fuel.

§ 1054.235 What testing requirements apply for certification?

This section describes the exhaust emission testing you must perform to show compliance with the emission standards in §§ 1054.103 and 1054.105. See §§ 1054.240 and 1054.245 and Part 1065, subpart E, regarding service accumulation before emission testing.

(a) Select an emission-data engine from each engine family for testing as described in Part 1065.401. Select a configuration and set adjustable parameters in a way that is most likely to exceed the HC+NO_x standard in subpart B of this part, using good engineering judgment. Configurations must be tested as they will be produced, including installed governors, if applicable.

(b) Test your emission-data engines using the procedures and equipment specified in subpart F of this part. In the case of dual-fuel engines, measure emissions when operating with each type of fuel for which you intend to certify the engine. In the case of flexible-fuel engines, measure emissions when operating with the fuel mixture that is most likely to cause the engine to exceed the applicable HC+NO_x emission standard, though you may ask us to instead perform tests with both fuels separately if you can show that intermediate mixtures are not likely to occur in use.

(c) We may measure emissions from any of your emission-data engines or other engines from the emission 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 engine to a test facility we designate. The 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 engines, the results of that testing become the official emission results for the engine.

(3) We may set the adjustable parameters of your engine to any point within the physically adjustable ranges (see § 1054.115(b)).

(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, we may calibrate it within normal production tolerances for a parameter that is subject to production variability because it is adjustable during production, but is not considered an adjustable parameter (as defined in § 1054.801) because it is permanently sealed.

(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 emission family from the previous model year differs from the current emission family only with respect to model year, items identified in § 1054.225(a), or other characteristics unrelated to emissions. We may waive this paragraph (d)(1) for differences we determine not to be relevant.

(2) The emission-data engine from the previous model year remains the appropriate emission-data engine under paragraph (b) of this section.

(3) The data show that the emission-data engine would meet all the requirements of this part that apply to the emission family covered by the application for certification.

(e) We may require you to test another engine of the same or different configuration in addition to the engine(s) tested under paragraph (b) of this section.

(f) If you use an alternate test procedure under Part 1065.10 and later testing shows that such testing does not produce results that are equivalent to the procedures specified in subpart F of this part, we may reject data you generated using the alternate procedure.

(g) Measure CO₂ and CH₄ with each low-hour certification test using the procedures specified in Part 1065 starting in the 2013 model year. Also measure N₂O with each low-hour certification test using the procedures specified in Part 1065 starting in the 2013 model year for any engine family that depends on NO_x aftertreatment to meet emission standards. 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 0.001 g/kW-hr.

(h) The use of auxiliary fans for engine cooling must be indicated in the application for certification. The manufacturer must justify to the satisfaction of the Executive Officer in the application for certification the need for and use of such fans. The manufacturer must also demonstrate that the supplemental cooling resulting from the use of the fans is representative of in-use engine operation.

§ 1054.240 How do I demonstrate that my emission family complies with exhaust emission standards?

(a) For purposes of certification, your engine family is considered in compliance with the emission standards in §1054.101(a) if all emission-data engines representing that family have test results showing deteriorated emission levels at or below these standards. This paragraph (a) 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.

(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 emission standard in subpart B of this part. This

paragraph (b) also applies for all test points for emission-data engines within the family used to establish deterioration factors.

(c) Determine a deterioration factor to compare emission levels from the emission-data engine with the applicable emission standards in subpart B of this part. Section 1054.245 specifies how to test engines to develop deterioration factors that represent the expected deterioration in emissions over your engines' full useful life. Calculate a multiplicative deterioration factor as described in §1054.245. If the deterioration factor is less than one, use one. Specify the deterioration factor to one more significant figure than the emission standard. In the case of dual-fuel and flexible-fuel engines, apply deterioration factors separately for each fuel type.

(d) Determine the official emission result for each pollutant to at least one more decimal place than the applicable standard in subpart B of this part. Apply the deterioration factor to the official emission result, as described in §1054.245(e), then round the adjusted figure to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each emission-data engine. In the case of HC+NO_x standards, add the official emission results and apply the deterioration factor to the sum of the pollutants before rounding. However, if your deterioration factors are based on emission measurements that do not cover the engine's full useful life, apply deterioration factors to each pollutant and then add the results before rounding.

(e) The provisions of this paragraph (e) apply only for engine families with a useful life at or below 300 hours. To apply the deterioration factor to engines other than the original emission-data engine, they must be operated for the same number of hours before starting emission measurements that you used for the original emission-data engine, within one hour. For example, if the original emission-data engine operated for 8 hours before the low-hour emission test, operate the other test engines for 7 to 9 hours before starting emission measurements.

§ 1054.245 How do I determine deterioration factors from exhaust durability testing?

This section describes how to determine deterioration factors, either with pre-existing test data or with new emission measurements.

(a) Small-volume engine manufacturers may, at their option, use deterioration factors (DF) for HC+NO_x (NMHC+NO_x) and CO from Table 1 or Table 2 of this section or they may calculate deterioration factors for HC+NO_x (NMHC+NO_x) and CO according to the process described in paragraph (d) of this section. For technologies that are not addressed in Table 1 or Table 2 of this section, the manufacturer may ask the Executive Officer to assign a deterioration factor prior to the time of certification.

(b) Table 1 follows:

Table 1: Assigned HC+NO_x (NMHC+NO_x) and CO deterioration factors for small volume engine manufacturers for engines with displacement greater than 80 cc

Displacement Category	Side Valve Engines		Overhead Engines		Engines with Aftertreatment
	HC + NO _x (NMHC+NO _x)	CO	HC + NO _x (NMHC+NO _x)	CO	
>80 cc-<225 cc	2.1	1.1	1.5	1.1	DFs must be calculated using the formula in Subsection (d) below
≥225 cc	1.6	1.1	1.4	1.1	

(c) Table 2 follows:

TABLE 2.

Assigned HC+NO_x (NMHC+NO_x) and CO deterioration factors for small volume engine manufacturers for engines with displacement less than or equal to 80 cc

Displacement Category	Two-stroke Engines ¹		Four-Stroke Engines		Engines with Aftertreatment
	HC + NO _x (NMHC+NO _x)	CO	HC + NO _x (NMHC+NO _x)	CO	
0-80 cc, inclusive	1.1	1.1	1.5	1.1	DFs must be calculated using the formula in Subsection (d) below

¹ Two-stroke technologies to which these assigned deterioration factors apply include conventional two-strokes, compression wave designs, and stratified scavenging designs.

(d) Formula for calculating deterioration factors for engines with aftertreatment:

$$DF = [(NE * EDF) - (CC * F)] / (NE - CC)$$

Where:

DF = deterioration factor.

NE = new engine emission levels prior to the catalyst (g/kW-hr).

EDF = deterioration factor for engines without catalyst as shown in Table 1 or Table 2 of this section. CC = amount converted at 0 hours in g/kW-hr.

F = 0.8 for HC (NMHC), 1.0 for NO_x, and 0.8 for CO for all classes of engines.

(e)(1) Manufacturers shall obtain an assigned DF or calculate a DF, as appropriate, for each regulated pollutant for all engine families. Such DF shall be used for certification, production line testing, and compliance testing.

(2) For engines not using assigned deterioration factors from Table 1 or Table 2 of this section, deterioration factors shall be determined as follows:

(i) The new prototype engine must be emissions tested at zero hour (break in) with all emission control systems (e.g., EGR, catalysts, etc.) installed.

(ii) The engine must be aged on the emissions durability cycle to the first test point. The manufacturer must choose its test points that are equally divided (same number of hours \pm 2 hours). An emissions test is conducted at half the emissions durability period \pm 2 hours.

(iii) The prototype engine must be emissions tested at each test point. Following testing the durability cycle must be continued to the next point.

(iv) Only specified maintenance may be performed during durability cycle testing. In addition, an emission test must be performed before and after the maintenance is performed.

(v) When the prototype engine has been aged on the durability cycle to the full emissions durability cycle, a final emissions test must be conducted.

(vi) For each pollutant, a line must be fitted to the data points treating the initial test as occurring at hour=0, and using the method of least-squares. The deterioration factor is the calculated emissions at the end of the emissions durability period divided by the calculated emissions at zero hours.

(vii) If the engine manufacturer conducts more than one test at a test point, the number of tests at every test point must be the same. All tests must be used in a linear regression analysis as separate points to determine the deterioration factor.

(viii) Additional engines identical to the original test engine may be tested with prior approval from the Executive Officer. In such cases, data collection must remain consistent for all test engines. The testing of multiple engines requires the determination of separate deterioration factors for each test engine. The official deterioration factor shall be the average of the separate deterioration factors for each test engine.

(ix) The product of the zero-hour (break-in) results from the engine multiplied by the deterioration factor is the emissions certification value for that engine family and pollutant. In the case of multiple zero-hour tests on a single engine, the engine manufacturer must select the last zero-hour test as the official zero-hour test upon which the deterioration factor is applied. If multiple engines are tested, the manufacturer must select the highest zero-hour result among the last zero-hour test of each engine as the official zero-hour test upon which the deterioration factor is applied.

(3) CARB may reject a DF if the DF is not appropriate for that engine family. The manufacturer must retain actual emission test data to support its choice of DF and furnish that data to the Executive Officer upon request. Manufacturers may request approval by the Executive Officer of alternative procedures for determining deterioration.

(4) Calculated deterioration factors may cover model years in addition to the one upon which they were generated if the manufacturer submits a justification acceptable to the Executive Officer in advance of certification that the affected engine families can be reasonably expected to have similar emission deterioration characteristics.

(5) Engine families that undergo running changes need not generate a new DF, if the manufacturer submits a justification acceptable to the Executive Officer concurrent with the running change that the affected engine families can be reasonably expected to have similar emission deterioration characteristics.

§ 1054.250 What records must I keep and what reports must I send to CARB?

(a) Send to the Chief, Emissions Certification and Compliance Division, 4001 Iowa Street, Riverside, CA 92507, information related to your California-directed production volumes as described in §1054.345. In addition, within 45 days after the end of the model year, you must send CARB a report describing information about engines you produced during the model year as follows:

(1) State the total California and Federal production volume for each engine family.

(b) Organize and maintain the following records:

(1) A copy of all applications and any summary information you send us.

(2) Any of the information we specify in § 1054.205 that you were not required to include in your application.

(3) A detailed history of all emission-data engines. For each engine, describe all of the following:

(i) The emission-data engine's construction, including its origin and buildup, steps you took to ensure that it represents production engines, any components you built specially for it, and all the components you include in your application for certification.

(ii) How you accumulated engine operating hours (service accumulation), including the dates and the number of hours accumulated.

(iii) All maintenance, including modifications, parts changes, and other service, and the dates and reasons for the maintenance.

(iv) All your emission tests (valid and invalid), including the date and purpose of each test and documentation of test parameters as specified in Part 1065.

(v) All tests to diagnose engine or emission control performance, giving the date and time of each and the reasons for the test.

(vi) Any other significant events.

(4) Production figures for each emission family divided by assembly plant.

(5) Keep a list of engine identification numbers for all the engines you produce under each Executive Order.

(c) Keep required data from emission tests and all other information specified in this section for eight years after we issue your Executive Order. If you use the same emission data or other information for a later model year, the eight-year period restarts with each year that you continue to rely on the information.

(d) 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.

§ 1054.255 What decisions may CARB make regarding an Executive Order?

(a) If we determine your application is complete and shows that the engine family meets all the requirements of this part, the California Health and Safety Code, and Title 13, California Code of Regulations, Chapters 9 and 15, we will issue an Executive Order for the emission family for that model year. We may make the approval subject to additional conditions.

(b) We may deny an application for certification if we determine that an emission family fails to comply with emission standards or other requirements of this part or the California Health and Safety Code or Title 13, California Code of Regulations, Chapters 9 and 15. We will base our decision on all available information. If we deny an application, we will explain why in writing.

(c) In addition, we may deny your application or suspend or revoke your Executive Order if you do any of the following:

(1) Refuse to comply with any testing, reporting, or bonding requirements.

(2) Submit false or incomplete information. This includes doing anything after submitting an application that causes submitted information to be false or incomplete.

(3) Cause any test data to become inaccurate.

(4) Deny us from completing authorized activities (see subsections (i) through (vi) below). This includes a failure to provide reasonable assistance.

(i) We may inspect your testing, manufacturing processes, storage facilities (including port facilities for imported engines and equipment or other relevant facilities), or records, as authorized by California law, to enforce the provisions of this part 1054. Inspectors will have

authorizing credentials and will limit inspections to reasonable times—usually, normal operating hours.

(ii) If we come to inspect, we may or may not have a warrant or court order.

(A) If we do not have a warrant or court order, you may deny us entry.

(B) If we have a warrant or court order, you must allow us to enter the facility and carry out the activities it describes.

(iii) We may seek a warrant or court order authorizing an inspection described in this section whether or not we first tried to get your permission to inspect.

(iv) We may select any facility to do any of the following:

(A) Inspect and monitor any aspect of engine or equipment manufacturing, assembly, storage, or other procedures, and any facilities where you do them.

(B) Inspect and monitor any aspect of engine or equipment test procedures or test-related activities, including test engine/equipment selection, preparation, service accumulation, emission duty cycles, and maintenance and verification of your test equipment's calibration.

(C) Inspect and copy records or documents related to assembling, storing, selecting, and testing an engine or piece of equipment.

(D) Inspect and photograph any part or aspect of engines or equipment and components you use for assembly.

(v) You must give us reasonable help without charge during an inspection authorized by California law, including but not limited to the Health and Safety Code. For example, you may need to help us arrange an inspection with the facility's managers, including clerical support, copying, and translation. You may also need to show us how the facility operates and answer other questions. If we ask in writing to see a particular employee at the inspection, you must ensure that he or she is present (legal counsel may accompany the employee).

(vi) If you have facilities in other countries, we expect you to locate them in places where local law does not keep us from inspecting as described in this section. We will not try to inspect if we learn that local law prohibits it, but we may suspend your Executive Order if we are not allowed to inspect.

(5) Produce engines or equipment for importation into the United States at a location where local law prohibits us from carrying out authorized activities.

(6) Fail to supply requested information or amend your application to include all engines or equipment being produced.

(7) Take any action that otherwise circumvents the intent of the California Health and Safety Code, or this part 1054 or Title 13, California Code of Regulations, Chapters 9 and 15.

(d) We may void an Executive Order if you fail to keep records, send reports, or give us information as required under this part or the California Health and Safety Code, or Title 13, California Code of Regulations, Chapters 9 and 15.

(e) We may void an Executive Order if we find that you intentionally submitted false or incomplete information. This includes doing anything after submitting your application that causes the submitted information to be false or incomplete.

(f) If we deny an application or suspend, revoke, or void an Executive Order, you may ask for a hearing (see § 1054.820)

Subpart D – Production-line Testing

§1054.300 General provisions.

Upon the Executive Officer's request, the manufacturer must supply a reasonable number of production engines for testing and evaluation. These engines must be representative of typical production and supplied for testing at such time and place and for such reasonable periods as the Executive Officer may require. Manufacturers must comply with the production-line testing provisions as specified in Title 13, California Code of Regulations, Section 2407.

Subpart E – In-use Testing

§ 1054.401 General provisions.

We may perform in-use testing of any engines or equipment subject to the standards of this part. We will consult with you as needed for information or special equipment related to testing your engines.

Subpart F – Testing Procedures

§ 1054.501 How do I run a valid emission test?

(a) *Applicability.* This subpart is addressed to you as a manufacturer but it applies equally to anyone who does testing for you, and to us when we perform testing to determine if your engines or equipment meet emission standards.

(b) *General requirements.* Use the equipment and procedures for spark-ignition engines in Part 1065 to determine whether engines meet the exhaust emission standards, as follows:

(1) Measure the emissions of all exhaust constituents subject to emissions standards as specified in § 1054.505 and Part 1065. Measure CO₂, N₂O, and CH₄ as described in § 1054.235. See § 1054.650 for special provisions that apply for variable-speed engines (including engines shipped without governors).

(2) Use the appropriate fuels and lubricants specified in Part 1065, subpart H, for all the testing we require in this part. Use gasoline specified for general testing except as specified in paragraph (d) of this section. For service accumulation, use the test fuel or any commercially available fuel that is representative of the fuel that in-use engines will use.

(3) Ambient conditions for duty-cycle testing must be within ranges specified in of Part 1065.520, subject to the provisions of § 1054.115(c).

(i) *Corrections.* Emissions may not be corrected for the effects of test temperature or pressure. You may correct emissions for humidity as specified in of Part 1065.670.

(ii) *Intake air temperature.* Measure engine intake air temperature as described in Part 1065.125, and control it if necessary. For example, since the purpose of this requirement is to ensure that the measured air temperature is consistent with the intake air temperature that would occur during in-use operation at the same ambient temperature, do not cool the intake air and do not measure air temperature at a point where engine heat affects the temperature measurement.

(4) The provisions of Part 1065.405 describes how to prepare an engine for testing. However, you may consider emission levels stable without measurement after 12 hours of engine operation, except for the following special provisions that apply for engine families with a useful life of 300 hours or less:

(i) We will not approve a stabilization period longer than 12 hours even if you show that emissions are not yet stabilized.

(ii) Identify the number of hours you use to stabilize engines for low-hour emission measurements. You may consider emissions stable at any point less than 12 hours. For example, you may choose a point at which emission levels reach a low value before the effects of deterioration are established.

(5) Prepare your engines for testing by installing a governor that you normally use on production engines, consistent with §§ 1054.235(b) and 1054.505.

(6) During testing, supply the engine with fuel in a manner consistent with how it will be supplied with fuel in use. If you sell engines with complete fuel systems and your production engines will be equipped with a vapor line that routes running loss vapors into the engine's intake system, measure exhaust emissions using a complete fuel system representing a production configuration that sends fuel vapors to the test engine's intake system in a way that represents the expected in-use operation. You may alternatively demonstrate by engineering analysis that your engines will continue to meet emission standards for any amount of running loss vapor that can reasonably be expected during in-use operation.

(7) Determine the carbon mass fraction of fuel, w_c , using a calculation based on measured fuel properties as described in Part 1065.655(d)(1). You may not use the default values specified in Part 1065.655(d)(2).

(8) Engine service accumulation and stabilization procedure. Use the service accumulation procedure determined by the manufacturer for exhaust emission stabilizing of an engine, consistent with good engineering practice.

(i) The manufacturer determines, for each engine family, the number of hours at which the engine exhaust emission control system combination is stabilized for emission testing. However, this stabilization procedure may not exceed 12 hours. The manufacturer must maintain, and provide to the Executive Officer upon request, a record of the rationale used in making this determination. If the manufacturer can document that at some time prior to the full 12 hour service accumulation period the engine emissions are decreasing for the remainder of the 12 hours, the service accumulation may be completed at that time. The manufacturer may elect to accumulate 12 hours on each test engine within an engine family without making this determination.

(ii) During service accumulation, the fuel and lubricants specified in Part 1065 must be used.

(iii) Engine maintenance during service accumulation is allowed only in accordance with Part 1065.

(9) Engine pre-test preparation.

(i) Drain and charge the fuel tank(s) with the specified test fuel to 50 percent of the tank's nominal capacity. If an external fuel tank is used, the engine fuel inlet system pressure must be typical of what the engine will see in use.

(ii) If you are using the raw gas sampling method, operate the engine on the dynamometer measuring the fuel consumption and torque before and after the emission sampling equipment is installed, including the sample probe.

(10) Analyzer pre-test procedures.

(i) If necessary, warm up and stabilize the analyzer(s) before calibrations are performed.

(ii) Replace or clean the filter elements and then leak check the system as required by Part 1065. If necessary, allow the heated sample line, filters and pumps to reach operating temperature.

(iii) Perform the following system checks:

(A) If necessary, check the sample line temperature. Heated FID sample line temperature must be maintained between 110°C and 230°C; a heated NO_x sample line temperature must be maintained between 60°C and 230°C.

(B) Check that the system response time has been accounted for prior to sample collection data recording.

(C) A HC hang-up check is permitted.

(iv) Check analyzer zero and span before and after each test at a minimum. Further, check analyzer zero and span any time a range change is made or at the maximum demonstrated time span for stability for each analyzer used.

(11) Check system flow rates and pressures and reset, if necessary.

(c) *Special and alternate procedures.* You may use special or alternate procedures to the extent we allow them under Part 1065.10. The following additional provisions apply:

(1) If you are unable to run the test cycle specified in this part for your engine, use an alternate test cycle that will result in a cycle-weighted emission measurement equivalent to the expected average in-use emissions. This cycle must be approved under Part 1065.10.

(2) Describe in your application for certification any specially designed fixtures or other hardware if they are needed for proper testing of your engines. (Note: You do not need to specify the size or performance characteristics of engine dynamometers.) You must send us these fixtures or other hardware if we ask for them. We may waive the requirement of §1054.205(aa) to identify a test facility in the United States for such engine families as long as the projected California-directed production volume of all your engine families using the provisions of this paragraph (c)(2) is less than 5 percent of your total production volume from all engine families certified under this part 1054.

(d) *Wintertime engines.* You may test wintertime engines at the ambient temperatures specified in Part 1065.520, even though this does not represent in-use operation for these engines (Part 1065.10(c)(1)). In this case, you may modify the test engine as needed to achieve intake temperatures that are analogous to in-use conditions. You may also test wintertime engines at reduced ambient temperatures as specified in 40 CFR 1051.505. Use the gasoline specified for low-temperature testing only if you test your engines at ambient temperatures below 20 °C.

§ 1054.505 How do I test engines?

(a) This section describes how to test engines under steady-state conditions. For handheld engines, you must perform tests with discrete-mode sampling. For nonhandheld engines we allow you to perform tests with either discrete-mode or ramped-modal testing methods. You must use the same modal testing method for certification and all other testing you perform for an engine family. If we test your engines to confirm that they meet emission standards, we will

use the modal testing method you select for your own testing. If you submit certification test data collected with both discrete-mode and ramped-modal testing (either in your original application or in an amendment to your application), either method may be used for subsequent testing. We may also perform other testing as allowed by the California's Health and Safety Code. Conduct duty-cycle testing as follows:

(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. Control engine speed as specified in this section. Use one of the following methods for confirming torque values for nonhandheld engines:

(i) Calculate torque-related cycle statistics and compare with the established criteria as specified in Part 1065.514 to confirm that the test is valid.

(ii) Evaluate each mode separately to validate the duty cycle. All torque feedback values recorded during non-idle sampling periods must be within ± 2 percent of the reference value or within ± 0.27 N·m of the reference value, whichever is greater. Also, the mean torque value during non-idle sampling periods must be within ± 1 percent of the reference value or ± 0.12 N·m of the reference value, whichever is greater. Control torque during idle as specified in paragraph (c) of this section.

(2) For ramped-modal testing, start sampling at the beginning of the first mode and continue sampling until the end of the last mode. Calculate emissions and cycle statistics the same as for transient testing as specified in Part 1065. Unless we specify otherwise, you may simulate the governor for ramped-modal testing.

(b) Measure emissions by testing the engine on a dynamometer with the test procedures for constant-speed engines in Part 1065 while using one of the steady-state duty cycles identified in this paragraph (b) to determine whether it meets the exhaust emission standards specified in § 1054.101(a). This requirement applies for all engines, including those not meeting the definition of "constant-speed engine" in Part 1065.1001.

(1) For handheld engines, use the two-mode duty cycle described in paragraph (a) of Appendix II of this part. Establish an engine's rated speed as follows:

(i) For ungoverned handheld engines used in fixed-speed applications all having approximately the same nominal in-use operating speed, hold engine speed within 350 rpm of the nominal speed for testing. We may allow you to include in your engine family without additional testing a small number engines that will be installed such that they have a different nominal speed. If your engine family includes a majority of engines with approximately the same nominal in-use operating speed and a substantial number of engines with different nominal speeds, you must test engines as specified in this paragraph (b)(1)(i) and paragraph (b)(1)(ii) of this section.

(ii) For ungoverned handheld engines for which there is not a dominant value for nominal in-use operating speeds, hold engine speed within 350 rpm of the point at which the engine generates maximum power.

(iii) For governed handheld engines, hold engine speed at maximum test speed, as defined in Part 1065.1001.

(2) For nonhandheld engines, use the six-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (b) of Appendix II of this part. Control engine speeds and torques during idle mode as specified in paragraph (c) of this section. Control engine speed during the full-load operating mode as specified in paragraph (d) of this section. For all other modes, control the engine speed to within 5 percent of the nominal speed specified in paragraph (d) of this section or let the installed governor (in the production configuration) control engine speed. For all modes except idle, control torque as needed to meet the cycle-validation criteria in paragraph (a)(1) of this section. The governor may be adjusted before emission sampling to target the nominal speed identified in paragraph (d) of this section, but the installed governor must control engine speed throughout the emission-sampling period whether the governor is adjusted or not. Note that ramped-modal testing involves continuous sampling, so governor adjustments may not occur during such a test. Note also that our testing may involve running the engine with the governor in the standard configuration even if you adjust the governor as described in this paragraph (b)(2) for certification or production-line testing.

(c) During idle mode for nonhandheld engines, operate the engine with the following parameters:

(1) Allow the engine to operate at the idle speed determined by the installed governor. If any production engines from the engine family have a user-selectable idle speed, operate the engine with an installed governor that controls engine speed to the lowest available speed setting.

(2) Keep engine torque under 5 percent of the nominal torque value for Mode 1.

(3) You must conduct testing at the idle mode even if the allowable torque values overlap with those for another specified mode.

(d) During full-load operation for nonhandheld engines, operate the engine with the following parameters:

(1) In normal circumstances, select a test speed of either 3060 rpm or 3600 rpm that is most appropriate for the engine family. If all the engines in the engine family are used in intermediate-speed equipment, select a test speed of 3060 rpm. The test associated with intermediate-speed operation is referred to as the A Cycle. If all the engines in the engine family are used in rated-speed equipment, select a test speed of 3600 rpm. The test associated with rated-speed operation is referred to as the B Cycle. If an engine family includes engines used in both intermediate-speed equipment and rated-speed equipment,

select the test speed for emission-data engines that will result in worst-case emissions. In unusual circumstances, you may ask to use a test speed different than that specified in this paragraph (d)(1) if it better represents in-use operation.

(2) Operate the engine ungoverned at wide-open throttle at the test speed established in paragraph (d)(1) of this section until the engine reaches thermal stability as described in Part 1065.530(a)(2)(ii). Record the torque value after stabilization. Use this value for the full-load torque setting and for denormalizing the rest of the duty cycle.

(3) Control engine speed during emission sampling to stay within 5 percent of the nominal speed identified in paragraph (d)(1) of this section.

(4) The provisions of this paragraph (d) apply instead of the engine mapping procedures in Part 1065.510.

(e) See Part 1065 for detailed specifications of tolerances and calculations.

§ 1054.520 What testing must I perform to establish deterioration factors?

Sections 1054.240 and 1054.245 describe the required methods for testing to establish deterioration factors for an emission family.

Subpart G – Special Compliance Provisions

§ 1054.601 What compliance provisions apply?

(a) Engine and equipment manufacturers, as well as owners, operators, and rebuilders of engines subject to the requirements of this part, and all other persons, must observe the provisions of this part and the provisions of California's Health and Safety Code.

(b) Note that the provisions of 40 CFR 1068.103(f) prohibit engine manufacturers from deviating from normal production and inventory practices to stockpile engines with a date of manufacture before new or changed emission standards take effect. If your normal practice for producing engines subject to this part 1054 includes maintaining engines in inventory for some engine families for more than 12 months, you must get our prior approval to continue this practice for model years in which emission standards change. Include in your request information showing that this is necessary and it is consistent with your normal business practice. Unless we specify otherwise, include relevant inventory and production records from the preceding eight years. Note that 40 CFR 1068.103(f) applies to any engines inventoried beyond your normal practice and authorizes us to review your records to verify your normal practices, whether or not you maintain the engines in inventory for more than 12 months.

(c) The provisions of 40 CFR 1068.215 apply for cases in which the manufacturer takes possession of engines for purposes of recovering components as described in this paragraph (c). Note that this paragraph (c) does not apply for certified engines that still have the emission control information label since such engines do not need an exemption.

(1) You must label the engine as specified in Title 13, California Code of Regulations, Chapter 9, Article 1, Section 2404.

(2) You may not resell the engine. For components other than the engine block, you may generate revenue from the sale of the components that you recover, or from the sale of new engines containing these components. You may also use components other than the engine block for engine rebuilds as otherwise allowed under the regulations. You may use the engine block from an engine that is exempted under this paragraph (c) only to make a new engine, and then only where such an engine has a separate identity from the original engine.

(3) Once the engine has reached its final destination, you may stop collecting records describing the engine's final disposition and how you use the engine. This does not affect the requirement to maintain the records you have already collected under 40 CFR 1068.215. This also does not affect the requirement to maintain records for new engines.

(d) Subpart C of this part describes how to test and certify dual-fuel and flexible-fuel engines. Some multi-fuel engines may not fit the definitions in this part of either dual-fuel or flexible-fuel. For such engines, we will determine whether it is most appropriate to treat them as single-fuel engines, dual-fuel engines, or flexible-fuel engines based on the range of possible and expected fuel mixtures.

§ 1054.635 What special provisions apply for small-volume engine and equipment manufacturers?

This section describes how we apply the special provisions in this part for small-volume engine and equipment manufacturers. Small-volume engine and equipment manufacturers may use assigned deterioration factors. See §1054.245.

§ 1054.645 What special provisions apply for converting an engine to use an alternate fuel?

An Executive Order is no longer valid for an engine if the engine is modified such that it is not in a configuration covered by the Executive Order. Such engines may need to be recertified as specified in this part 1054 if the Executive Order is no longer valid for that engine.

§ 1054.650 What special provisions apply for adding or changing governors?

The special provisions in this section apply for engines that will not be governed to control engine speeds consistent with the constant-speed operation reflected by the duty cycles specified in § 1054.505. We refer to these as constant-speed governors in this section. Paragraph (a) of this section also applies for any engines shipped without installed governors.

(a) The representative-testing requirements of Part 1065.10(c)(1) related to in-use duty cycles do not apply to engines you produce and ship without constant-speed governors if you comply with all the following requirements:

(1) You must have test data showing that the effectiveness of the engine's emission controls over the expected range of in-use operation will be similar to that measured over the specified duty cycle. Alternatively, if your emission controls depend on maintaining a consistent air-fuel ratio, you may demonstrate that the engine is calibrated to maintain a consistent air-fuel ratio over the expected range of in-use operation.

(2) Describe in your application for certification the data and analysis that supports your conclusion.

§ 1054.655 What special provisions apply for installing and removing altitude kits?

An action for the purpose of installing or modifying altitude kits and performing other changes to compensate for changing altitude is not considered a prohibited act if it is done consistent with the manufacturer's instructions.

§ 1054.660 What are the provisions for exempting emergency rescue equipment?

Fire and police departments and other entities that specialize in emergency response may purchase emergency equipment powered by a non-California certified engine under the provisions specified in Title 13, California Code of Regulations, Chapter 9, Article 1, Section 2403(f).

Subpart H – Averaging, Banking, and Trading for Certification

§ 1054.701 General provisions.

Each manufacturer must comply with all provisions of the averaging, banking, and trading program outlined in Title 13, California Code of Regulations, Sections 2408-2409, for each engine family participating in that program.

Subpart I – Definitions and Other Reference Information

§ 1054.801 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning California's Health and Safety Code gives to them. The definitions follow:

Adjustable parameter means any device, system, or element of design that someone can adjust (including those which are difficult to access) and that, if adjusted, may affect emissions or engine performance during emission testing or normal in-use operation.

Aftertreatment means relating to a catalytic converter, particulate filter, thermal reactor, or any other system, component, or technology mounted downstream of the exhaust valve (or exhaust port) whose design function is to decrease emissions in the engine exhaust before it is exhausted to the environment. Exhaust-gas recirculation (EGR), turbochargers, and oxygen sensors are not aftertreatment.

Applicable emission standard or applicable standard means an emission standard to which an engine (or equipment) is subject. Additionally, if an engine (or equipment) has been or is being certified to another standard or FEL, applicable emission standard means the FEL or other standard to which the engine (or equipment) has been or is being certified.

Auxiliary emission control device means any element of design that senses temperature, motive speed, engine RPM, transmission gear, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.

Brake power means the usable power output of the engine, not including power required to fuel, lubricate, or heat the engine, circulate coolant to the engine, or to operate aftertreatment devices.

Calibration means the set of specifications and tolerances specific to a particular design, version, or application of a component or assembly capable of functionally describing its operation over its working range.

Carryover means relating to certification based on emission data generated from an earlier model year as described in § 1054.235(d).

Certification means, with respect to new small off-road engines, obtaining an executive order for an engine family complying with the small off-road engine emission standards and requirements specified in the California Code of Regulations, Title 13, chapter 9, Sections 2400-2409.

Critical emission-related component means any of the following components:

(1) Electronic control units, aftertreatment devices, fuel-metering components, EGR-system components, crankcase-ventilation valves, all components related to charge-air compression and cooling, air filters, spark plugs, and all sensors and actuators associated with any of these components.

(2) Any other component whose primary purpose is to reduce emissions.

Days means calendar days unless otherwise specified. For example, when we specify working days we mean calendar days, excluding weekends and California state holidays.

Designated Compliance Officer means the Executive Officer of the California Air Resources Board or a designee of the Executive Officer.

Deteriorated emission level means the emission level that results from applying the appropriate deterioration factor to the official emission result of the emission-data engine.

Deterioration factor means the relationship between emissions at the end of useful life and emissions at the low-hour test point (see §§1054.240 and 1054.245), expressed as the ratio of emissions at the end of useful life to emissions at the low-hour test point.

Discrete-mode means relating to the discrete-mode type of steady-state test described in § 1054.505.

Displacement has the meaning given in § 1054.140.

Dual-fuel engine means an engine designed for operation on two different fuels but not on a continuous mixture of those fuels (see §1054.601(d)). For purposes of this part, such an engine remains a dual-fuel engine even if it is designed for operation on three or more different fuels.

Emission-data engine means an engine that is tested for certification. This includes engines tested to establish deterioration factors.

Emission-data equipment means an engine, piece of equipment, or fuel system component that is tested for certification. This includes units tested to establish deterioration factors.

Emission family has the meaning given in § 1054.230. We may refer to emission families as "engine families" where provisions relate only to exhaust emissions from engines.

Emission-related maintenance means maintenance that substantially affects emissions or is likely to substantially affect emission deterioration.

Engine as used in this part, refers to small off-road engine.

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

Equipment means any mechanical device commonly known as equipment, including vehicles. If the equipment has an installed engine, the term *equipment* includes the installed engine and fuel system components.

Equipment manufacturer means a manufacturer of equipment with an engine. All such equipment manufacturing entities under the control of the same person are considered to be a single equipment manufacturer.

Evaporative means relating to fuel emissions controlled by Title 13, California Code of Regulations, Chapter 15, Article 1. This generally includes emissions that result from permeation of fuel through the fuel-system materials or from ventilation of the fuel system.

Executive Order means an order issued by the Executive Officer of the California Air Resources Board or his or her delegate certifying engines for sale in California.

Exhaust-gas recirculation (EGR) means a technology that reduces emissions by routing exhaust gases that had been exhausted from the combustion chamber(s) back into the engine to be mixed with incoming air before or during combustion. The use of valve timing to increase the amount of residual exhaust gas in the combustion chamber(s) that is mixed with incoming air before or during combustion is not considered exhaust-gas recirculation for the purposes of this part.

Family emission limit (FEL) has the meaning given in Title 13, California Code of Regulations, Section 2401.

Flexible-fuel engine means an engine designed for operation on any mixture of two or more different fuels (see §1054.601(d)).

Fuel system means all components involved in transporting, metering, and mixing the fuel from the fuel tank to the combustion chamber(s), including the fuel tank, fuel tank cap, fuel pump, fuel filters, fuel lines, carburetor or fuel-injection components, and all fuel-system vents.

Fuel type means a general category of fuels such as gasoline or natural gas. There can be multiple grades within a single fuel type, such as premium gasoline, regular gasoline, or low-level ethanol-gasoline blends.

Handheld has the meaning given in Title 13, California Code of Regulations, Section 2401.

Hydrocarbon (HC) means the hydrocarbon group on which the emission standards are based for each fuel type, as described in subpart B of this part.

Identification number means a unique specification (for example, a model number/serial number combination) that allows someone to distinguish a particular engine from other similar engines.

Intermediate-speed equipment means nonhandheld equipment in which the installed engine is intended for operation at speeds substantially below 3600 rpm.

Low-hour means relating to an engine that is considered to have stabilized emissions and represents the undeteriorated emission level. A low-hour engine typically operates no more than a few hours beyond the minimum stabilization period. However, a low-hour engine could have more hours as long as emissions remain stable. In the absence of other information, a low-hour engine with a useful life of 300 hours or less would generally have operated no more than 15 hours and a low-hour engine with a longer useful life would generally have operated no more than 24 hours.

Manufacture means the physical and engineering process of designing, constructing, and assembling an engine or piece of equipment.

Maximum engine power has the meaning given in § 1054.140.

Nonhandheld means relating to an engine (or equipment) subject to the standards of this part that is not a handheld engine (or equipment).

Nonmethane hydrocarbon (NMHC) has the meaning given in Part 1065.1001. This generally means the difference between the emitted mass of total hydrocarbon and the emitted mass of methane.

Nonroad engine means a small off-road engine as defined in the California Code of Regulations, Title 13, Chapter 9, Section 2401.

Official emission result means the measured emission rate for an emission-data engine on a given duty cycle before the application of any deterioration factor.

Overhead valve means relating to a four-stroke spark-ignition engine in which the intake and exhaust valves are located above the combustion chamber within the cylinder head. Such engines are sometimes referred to as “valve-in-head” engines.

Owner’s 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 owner’s manual is typically provided to the ultimate purchaser at the time of sale. The owner’s manual may be in paper or electronic format.

Oxides of nitrogen has the meaning given in Part 1065.1001.

Part 1065 means “California Exhaust Emission Standards and Test Procedures for New 2013 and Later Small Off-Road Engines; Engine-Testing Procedures (Part 1065),” adopted October 25, 2012, and amended January 1, 2023.

Percent has the meaning given in Part 1065.1001.

Placed into service means put into initial use for its intended purpose. Engines and equipment do not qualify as being “placed into service” based on incidental use by a manufacturer or dealer.

Ramped-modal means relating to the ramped-modal type of steady-state test described in § 1054.505.

Rated-speed equipment means equipment in which the installed engine is intended for operation at a rated speed that is nominally 3600 rpm or higher.

Relating to as used in this section means relating to something in a specific, direct manner. This expression is used in this section only to define terms as adjectives and not to broaden the meaning of the terms.

Round has the meaning given in Part 1065.1001.

Scheduled maintenance means adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems periodically to keep a part or system from failing, malfunctioning, or wearing prematurely. It also may mean actions you expect are necessary to correct an overt indication of failure or malfunction for which periodic maintenance is not appropriate.

Side valve means relating to a four-stroke spark-ignition engine in which the intake and exhaust valves are located to the side of the cylinder, not within the cylinder head. Such engines are sometimes referred to as "L-head" engines.

Small-volume engine manufacturer means any engine manufacturer whose total production of small off-road engines slated for sale in California are projected at the time of certification of a given model year to be not more than 500 engines.

Snowthrower engine means an engine used exclusively to power snowthrowers.

Spark-ignition means relating to a gasoline-fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

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.

Test engine means an engine in a test sample.

Test sample means the collection of engines selected from the population of an emission family for emission testing. This may include testing for certification, production-line testing, or in-use testing.

Thermal reactor means a hot surface in the engine exhaust system that has the effect of significantly lowering emissions of one or more regulated pollutants. Hot surfaces that have an inconsequential effect on emissions are not thermal reactors.

Total hydrocarbon (THC) has the meaning given in Part 1065.1001. This generally means the combined mass of organic compounds measured by the specified procedure for measuring total hydrocarbon, expressed as an atomic hydrocarbon with an atomic hydrogen-to-carbon ratio of 1.85:1.

Total hydrocarbon equivalent (THCE) has the meaning given in Part 1065.1001. This generally means the sum of the carbon mass contributions of non-oxygenated hydrocarbon, 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.

Ultimate purchaser means, with respect to any new small off-road equipment or new small off-road engine, the first person who in good faith purchases such new off-road equipment or new off-road engine for purposes other than resale.

Useful life means the period during which the engine and equipment are designed to properly function in terms of power output and intended function, without being remanufactured, specified as a number of hours of operation or calendar years, whichever comes first. It is the period during which an off-road engine must comply with all applicable emission standards. If an engine has no hour meter, the specified number of hours does not limit the period during which an in-use engine is required to comply with emission standards unless the degree of service accumulation can be verified separately.

Variable-speed engine means an engine that is not a constant-speed engine.

Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch.

We (us, our) means the California Air Resources Board and any authorized representatives

Wide-open throttle means maximum throttle opening.

Wintertime engine means an engine used exclusively to power equipment that is used only in wintertime, such as snowthrowers and ice augers.

§ 1054.805 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part:

ABT Averaging, banking, and trading.

CARB California Air Resources Board

cc cubic centimeters.

CFR Code of Federal Regulations.

CH₄ methane.

CO carbon monoxide.

CO₂ carbon dioxide.

FEL Family Emission Limit.

g gram.

HC hydrocarbon.

hr hour.

kPa kilopascals.

kW kilowatts.

N₂O nitrous oxide.

NMHC nonmethane hydrocarbons.

NO_x oxides of nitrogen (NO and NO₂).

psig pounds per square inch of gauge pressure.

RPM revolutions per minute.

THC total hydrocarbon.

THCE total hydrocarbon equivalent.

U.S.C. United States Code.

§ 1054.815 What provisions apply to confidential information?

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method.

(b) We will handle your confidential information as described in Title 17, California Code of Regulations, Section 91000-91022.

(c) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you.

§ 1054.820 How do I request a hearing?

The hearing procedure set forth in Chapter 15, Title 13, California Code of Regulations, Section 2771 apply to this subpart.

§ 1054.821 Right of entry and access.

(a) Any engine manufacturer affected by these regulations, upon receipt of prior notice must admit or cause to be admitted during operating hours any CARB Enforcement Officer that has presented proper credentials to any of the following:

(1) Any facility where tests or procedures or activities connected with such tests or procedures are or were performed.

(2) Any facility where any new small off-road engine is present and is being, has been, or will be tested.

(3) Any facility where a manufacturer constructs, assembles, modifies, or builds-up an engine into a certification engine that will be tested for certification.

(4) Any facility where any record or other document relating to any of the above is located.

(b) Upon admission to any facility referred to in paragraph (c)(1) of this Section, any CARB Enforcement Officer must be allowed:

(1) To inspect and monitor any part or aspect of such procedures, activities, and testing facilities, including, but not limited to, monitoring engine preconditioning, emissions tests and break-in, maintenance, and engine storage procedures.

(2) To verify correlation or calibration of test equipment; and,

(3) To inspect and make copies of any such records, designs, or other documents; and,

(4) To inspect and/or photograph any part or aspect of any such certification engine and any components to be used in the construction thereof.

(c) To permit a CARB determination whether production small off-road engines conform in all material respects to the design specifications that apply to those engines described in the Executive Order certifying such engines and to standards prescribed herein. Engine manufacturers must, upon receipt of prior notice, admit any CARB Enforcement Officer, upon presentation of credentials, to:

(1) Any facility where any document design, or procedure relating to the translation of the design and construction of engines and emission related components described in the application for certification or used for certification testing into production engines is located or carried on; and,

(2) Any facility where any small off-road engines to be introduced into commerce are manufactured or assembled.

(3) Any California retail outlet where any small off-road engine is sold.

(d) On admission to any such facility referred to in this Section, any CARB Enforcement Officer must be allowed:

(1) To inspect and monitor any aspects of such manufacture or assembly and other procedures;

(2) To inspect and make copies of any such records, documents or designs; and,

(3) To inspect and photograph any part or aspect of any such new small off-road engines and any component used in the assembly thereof that are reasonably related to the purpose of the Enforcement Officer's entry.

(e) Any CARB Enforcement Officer must be furnished by those in charge of a facility being inspected with such reasonable assistance as may be necessary to discharge any function listed in this paragraph. Each applicant for or recipient of certification is required to cause those in charge of a facility operated for its benefit to furnish such reasonable assistance without charge to CARB irrespective of whether or not the applicant controls the facility.

(f) The duty to admit or cause to be admitted any CARB Enforcement Officer applies whether or not the applicant owns or controls the facility in question and applies both to domestic and foreign engine manufacturers and facilities. CARB will not attempt to make any inspections that it has been informed that local law forbids. However, if local law makes it impossible to insure the accuracy of data generated at a facility, no informed judgment that an engine is certifiable or is covered by an Executive Order can properly be based on the data. It is the responsibility of the engine manufacturer to locate its testing and manufacturing facilities in jurisdictions where this situation will not arise.

(g) For purposes of this Section:

(1) "Presentation of credentials" means a display of a document designating a person to be a CARB Enforcement Officer.

(2) Where engine, component, or engine storage areas or facilities are concerned, "operating hours" means all times during which personnel are at work in the vicinity of the area or facility and have access to it.

(3) Where facilities or areas other than those covered by paragraph (g)(2) of this Section are concerned, "operating hours" means all times during which an assembly line is in operation or during which testing, maintenance, break-in procedure, production or compilation of records, or any other procedure or activity is being conducted related to certification testing, translation of designs from the test stage to the production stage, or engine manufacture or assembly.

(4) "Reasonable assistance" includes, but is not limited to, providing clerical, copying, interpretation and translation services; making personnel available upon request to inform the CARB Enforcement Officer of how the facility operates and to answer questions; and performing requested emissions tests on any engine that is being, has been, or will be used for certification testing. Such tests must be nondestructive, but may require appropriate break-in. The engine manufacturer must be compelled to cause the personal appearance of any employee at such a facility before a CARB Enforcement Officer, upon written request from the Executive Officer for the appearance of any employee of a facility, and service of such request upon the engine manufacturer. Any such employee who has been instructed by the engine manufacturer to appear will be entitled to be accompanied, represented, and advised by counsel.

§ 1054.825 What reporting and recordkeeping requirements apply under this part?

(a) This part includes various requirements to submit and record data or other information. Unless we specify otherwise, store required records in any format and on any media and keep them readily available for eight years after you send an associated application for certification, or eight years after you generate the data if they do not support an application for certification. We may request these records at any time. You must promptly give us organized, written records in English if we ask for them. This requirement to give us records applies

whether or not you rely on someone else to keep records on your behalf. We may require you to submit written records in an electronic format.

(b) The regulations in §1054.255 and in Title 13, California Code of Regulations, sections 2405-2409, describe your obligation to report truthful and complete information. This includes information not related to certification. If you fail to properly report information and keep the records we specify, we may, after considering relevant factors, including, as appropriate, factors in Health and Safety code section 43024(b), suspend, revoke, or void the executive order for the engine family involved, and you may be subject to civil or criminal penalties.

(c) Send all reports and requests for approval to the Designated Compliance Officer (see §1054.801).

(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 CARB. We may require you to send us these records.

(e) The following items illustrate the kind of reporting and recordkeeping we require for engines and equipment regulated under this part:

(1) We specify the following requirements related to engine and equipment certification in this part 1054:

(i-iii) [Reserved]

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

(v-vi) [Reserved]

(vii) 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.

(viii) [Reserved]

(2) [Reserved]

(3) We specify the following requirements related to testing in Part 1065:

(i) In Part 1065.2 we give an overview of principles for reporting information.

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

(iii) In Part 1065.25 we establish basic guidelines for storing test information.

(iv) In Part 1065.695 we identify the specific information and data items to record when measuring emissions.

(4) [Reserved]

Part 1054, App. I
Appendix I to Part 1054—[Reserved]

Appendix II to Part 1054—Duty Cycles for Laboratory Testing

(a) Test handheld engines with the following steady-state duty cycle:

G3 mode No.	Engine speed^a	Torque(percent)^b	Weighting factors
1	Rated speed	100	0.85
2	Warm idle	0	0.15

^a Test engines at the specified speeds as described in § 1054.505.

^b Test engines at 100 percent torque by setting operator demand to maximum. Control torque during idle at its warm idle speed as described in Part 1065.510.

(b) Test nonhandheld engines with one of the following steady-state duty cycles:

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

G2 mode No.^a	Torque (percent)^b	Weighting factors
1	100	0.09
2	75	0.2
3	50	0.29
4	25	0.3
5	10	0.07
6	0	0.05

^a Control engine speed as described in § 1054.505. Control engine speed for Mode 6 as described in § 1054.505(c) for idle operation.

^b The percent torque is relative to the value established for full-load torque, as described in § 1054.505.

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

RMC mode^a	Time in mode (seconds)	Torque (percent)^{b, c}
1a Steady-state	41	0
1b Transition	20	*
2a Steady-state	135	100
2b Transition	20	*
3a Steady-state	112	10
3b Transition	20	*
4a Steady-state	337	75
4b Transition	20	*
5a Steady-state	518	25
5b Transition	20	*
6a Steady-state	494	50
6b Transition	20	*
7 Steady-state	43	0

* Linear transition.

^a Control engine speed as described in § 1054.505. Control engine speed for Mode 6 as described in § 1054.505(c) for idle operation.

^b 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.

^c The percent torque is relative to the value established for full-load torque, as described in § 1054.505.