**PART 89—CONTROL OF EMISSIONS FROM NEW AND IN-USE NONROAD COMPRESSION-IGNITION ENGINES**

1. The authority for part 89 continues to read as follows:
Authority: 42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7545, 7547, 7549, 7550, and 7601(a).

**Subpart A—[Amended]**

2. Section 89.2 is amended by revising the definition of "United States" to read as follows:
**§89.2 Definitions.**
* * * * *

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, and the U.S. Virgin Islands.
* * * * *

**Subpart B—[Amended]**

3. Section 89.112 is amended by revising the text of paragraph (f)(1) to read as follows:
**§89.112 Oxides of nitrogen, carbon monoxide, hydrocarbon, and particulate matter exhaust emission standards.**
* * * * *
(f) * * *
(1) Voluntary standards. Engines may be designated "Blue Sky Series" engines by meeting the voluntary standards listed in Table 3, which apply to all certification and in-use testing, as follows:

4. A new part 1039 is added to subchapter U of chapter I, to read as follows:

**SUBCHAPTER U—AIR POLLUTION CONTROLS**

**PART 1039—CONTROL OF EMISSIONS FROM NEW AND IN-USE NONROAD COMPRESSION-IGNITION ENGINES**

**Subpart A—Determining How to Follow This Part**

Sec.



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



**Subpart C—Certifying Engine Families**



**Subpart D—[Reserved]**

**Subpart E—Testing In-use Engines [Reserved]**

Authority: 42 U.S.C. 7401 - 7671(q).

**Subpart A—Determining How to Follow This Part**

**§1039.1 Does this part apply to me?**

(a) This part applies to you if you manufacture or import new, compression-ignition nonroad engines (defined in §1039.801), unless we exclude them under §1039.5. See §1039.20 for the requirements that apply to excluded engines. Subpart G of this part also contains provisions that apply to manufacturers of nonroad equipment.

(b) If you manufacture or import engines with maximum brake power at or above 250 kW that would otherwise be covered by 40 CFR part 1048, you may choose to meet the requirements of this part instead. In this case, all the provisions of this part apply for those engines.

(c) As noted in subpart G of this part, 40 CFR part 1068 applies to everyone, including anyone who manufactures, imports, installs, owns, operates, or rebuilds any of the engines this part covers or equipment containing these engines.

(d) See §§1039.801 and 1039.805 for definitions and acronyms that apply to this part. The definition section contains significant regulatory provisions and it is very important that you read them.

**§1039.5 Which engines are excluded or exempted from this part's requirements?**

(a) This part does not apply to the following nonroad engines:

(1) Locomotive engines. Locomotive engines certified to meet the requirements of 40 CFR part 92 are not subject to the provisions of this part 1039. The regulations in 40 CFR part 92 specify that locomotive auxiliary CI engines and locomotive CI engines less than 750 kW are regulated by this part 1039. The regulations in 40 CFR part 92 also allow manufacturers to certify some other locomotive engines under this part 1039 instead of part 92.

(2) Marine engines. Marine engines certified to meet the requirements of 40 CFR part 94 are not subject to the provisions of this part 1039. The regulations in 40 CFR part 94 specify that marine CI engines under 37 kW are regulated by 40 CFR part 89. The regulations in 40 CFR part 94 also allow manufacturers to certify some other marine engines under this part 1039 instead of 40 CFR part 94.

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

(4) Hobby engines. Engines with per-cylinder displacement of less than 50 cc are not subject to the provisions of this part 1039.

(5) Aircraft engines. Aircraft engines are not subject to the provisions of this part 1039. See 40 CFR part 87 for engines used in aircraft.

(b) See subpart G of this part and 40 CFR part 1068, subpart C, for exemptions of specific engines.

(c) Send the Designated Compliance Officer a written request if you want us to determine whether this part covers or excludes certain engines. Excluding engines from this part's requirements does not affect other requirements that may apply to them.

(d) As defined in §1039.801, stationary engines are not required to comply with this part (because they are not nonroad engines), except that you must meet the requirements in §1039.20. In addition, the prohibitions in 40 CFR

1068.101 restrict the use of stationary engines for non-stationary purposes.

**§1039.10 What main steps must I take to comply with this part?**

(a) You must have a certificate of conformity from us for each engine family before you do any of the following with a new nonroad engine covered by this part: sell, offer for sale, introduce into commerce, distribute or deliver for introduction into commerce, or import it into the United States. "New" engines may include some already placed in service (see the definition of "new nonroad engine" and "new nonroad equipment" in §1039.801). You must get a new certificate of conformity for each new model year.

(b) To get a certificate of conformity and comply with its terms, you must do six things:

(1) Meet the emission standards and other requirements in subpart B of this part.

(2) Perform preproduction emission tests.

(3) Apply for certification (see subpart C of this part).

(4) Do emission testing on in-use engines, as we direct under subpart E of this part.

(6) Follow our instructions throughout this part.

(c) Subpart F of this part describes how to test your engines (including references to other parts).

(d) Subpart G of this part and 40 CFR part 1068 describe requirements and prohibitions that apply to engine manufacturers, equipment manufacturers, owners, operators, rebuilders, and all others.

(e) Note that §1039.145 discusses certain interim requirements and compliance provisions that apply only for a limited time.

**§1039.15 Do any other regulation parts affect me?**

(a) Part 1065 of this chapter describes procedures and equipment specifications for testing engines. Subpart F of this part describes how to apply the provisions of part 1065 of this chapter to show you meet the emission standards in this part.

(b) Part 1068 of this chapter describes general provisions, including these seven areas:

(1) Prohibited acts and penalties for engine manufacturers, equipment manufacturers, and others.

(2) Rebuilding and other aftermarket changes.

(3) Exclusions and exemption for certain engines.

(4) Importing engines.

(5) Selective enforcement audits of your production.

(6) Defect reporting and recall.

(7) Procedures for hearings.

(c) Other parts of this chapter affect you if referenced in this part.

**§1039.20 What requirements from this part apply to my excluded engines?**

(a) Engine manufacturers producing an engine excluded under §1039.5(d) must add a permanent label or tag identifying each engine. This applies equally to importers. To meet labeling requirements, you must do the following things:

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

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

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

(4) Write it in block letters in English.

(5) Instruct equipment manufacturers that they must place a duplicate label as described in 40 CFR 1068.105 if they obscure the engine's label.

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

(1) Include the heading "Emission Control Information".

(2) Include your full corporate name and trademark.

(3) State the engine displacement (in liters) and maximum brake power.

(4) State: "THIS ENGINE IS EXCLUDED FROM THE REQUIREMENTS OF 40 CFR PART 1039 AS A "STATIONARY ENGINE." INSTALLING OR USING THIS ENGINE IN ANY OTHER APPLICATION MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.".

(c) You may ask to use alternate labels.

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

**§1039.101 What exhaust emission standards must my engines meet?**

Apply the exhaust emission standards in Table 1 of this section by model year. You may choose to certify engines earlier than we require. The Tier 4 standards apply to steady-state and transient testing, as described in paragraphs (a) and (b) of this section. See §1039.145 to determine if there are alternate phase-in provisions. Table 1 follows:

| Tier 4 Exhaust Emissions Standards | | | | | | |
|---|---|---|---|---|---|---|
| Engine Power | First Model Year for Which Standards Apply | Emissions Standard g/kW-hr | | | | |
| | | PM | NOx | NMHC | NMHC+NOx | CO |
| kW < 19 | 2008 | 0.40 | - | - | 7.5 | 6.6 |
| 19 ≤ kW < 56 | 2013[a] | 0.034 | - | - | 4.7 | 5.0 |
| 56 ≤ kW < 130 | 2012 | 0.020 | 0.40 | 0.19 | - | 5.0 |
| 130 ≤ kW < 560 | 2011 | 0.020 | 0.40 | 0.19 | - | 3.5 |
| kW ≥ 560 | 2011 | 0.020 | 0.40 | 0.19 | - | 3.5 |

[a] The PM Tier 4 PM standard for engines 37 ≤ kW <56 applies beginnning in the 2012 model year.

(a) Emission standards for transient testing. Emissions from your engines, as measured using the transient test procedures listed in subpart F of this part, may not exceed the emission standards listed in Table 1 of this section. The requirements of this paragraph (a) do not apply for constant-torque engines.

(b) Emission standards for steady-state testing. Emissions from your engines, as measured using the steady-state test procedures listed in subpart F of this part, may not exceed the emission standards listed in Table 1 of this section. The requirements of this paragraph (b) apply for all engines.

(c) Averaging banking and trading. You may choose to meet the NOx, NMHC+NOx, or PM standards described in this section on average using the averaging, banking, and trading (ABT) provisions of subpart H of this part. To do this, determine a single FEL for each pollutant for each engine family included in the ABT program. This FEL will be considered the applicable standard for the engine family with respect to both steady-state and transient testing. The FEL may not be higher than the following limits:

| Tier 4 FEL Caps | | | |
|---|---|---|---|
| Engine Power | Emission g/kW-hr | | |
| | PM | NOx | NMHC+NOx |
| kW < 8 | 0.80 | - | 10.5 |
| 8 ≤ kW < 19 | 0.80 | - | 9.5 |
| 19 ≤ kW < 56 | 0.054 | - | 7.5 |
| 56 ≤ kW < 130 | 0.040 | 0.80 | - |
| 130 ≤ kW < 560 | 0.040 | 0.80 | - |
| kW ≥ 560 | 0.040 | 0.80 | - |

(d) Not-to-exceed standards. Not-to-exceed (NTE) standards are determined for each pollutant based on the transient standard or FEL to which an engine family is certified. Emissions from the engine, as measured according to the procedures specified §1039.515, may not exceed any applicable NTE standard.

(1) Determine the NTE standard, rounded to the same number of decimal places as the applicable transient standard, from the following equation:

NTE standard for each pollutant = (STD) × (M), where

(i) STD = The transient standard specified for that pollutant in paragraph (a) of this section if you certify without using ABT for that pollutant, or the FEL for that pollutant if you certify using ABT.

(ii) M = The NTE multiplier for that pollutant, as defined in paragraph (d)(2) of this section.

(2) The NTE multiplier for each pollutant equals 1.25, except in the following cases:

| If . . . | or . . . | then . . . |
|---|---|---|
| (i) The engine family is certified to a NOx standard less than 2.00 g/kW-hr without using ABT | The engine family is certified to a NOx FEL less than 2.00 g/kW-hr | The multipliers for NOx and for NMHC are 1.50 |
| (ii) The engine family is certified to a PM standard less than 0.07 g/kW-hr without using ABT | The engine family is certified to a PM FEL less than 0.07 g/kW-hr | The multiplier for PM is 1.50 |

(3) You may choose which ambient operating regions apply for NTE testing.

(i) You do not need to choose the same region for different engine families. You must indicate your choice in your application for certification. The region that you choose will apply for all NTE testing of engines in your engine family. You must choose one of the following two options:

(A) All altitudes less than or equal to 5,500 feet above sea-level, during all ambient conditions (temperature and humidity).

(B) All altitudes less than or equal to 5,500 feet above sea-level, for temperatures less than or equal to the temperature determined by the following equation at the specified altitude;

$$T = -0.00254 \times A + 100$$

Where;

T = ambient air temperature in degrees Fahrenheit

A = altitude in feet above sea-level (A is negative for altitudes below sea-level)

(ii) Temperature and humidity ranges for which correction factors are allowed are specified in 40 CFR §86.1370-2007(e).

(4) For engines equipped with exhaust gas recirculation, the NTE emission limits of this section do not apply to during cold operating conditions as specified in 40 CFR § 86.1370(f).

(e) Field testing standards. [Reserved]

(f) Fuel types. Apply the exhaust emission standards in this section for engines using each type of fuel specified in 40 CFR part 1065, subpart C, for which they are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Diesel-fueled engines: NMHC emissions.

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

(3) Alcohol-fueled engines: THCE emissions.

(g) Useful life. (1) Your engines must meet the exhaust emission standards in paragraphs (a) through (d) of this section over their full useful life (§1039.240 describes how to use deterioration factors to show this). The useful life values are shown in the following table:

| If your engine is certified as . . . | And your rated power is . . . | And your rated speed is . . . | Your useful life is . . . |
|---|---|---|---|
| Variable speed or constant speed | Less than 19 kW | Any speed | 3,000 hours or five years, whichever is reached first |
| Constant speed | At least 19 kW, but less than 37 kW | 3,000 rpm or higher | 3,000 hours or five years, whichever is reached first |
| Constant speed | At least 19 kW, but less than 37 kW | Less than 3,000 rpm | 5,000 hours or seven years, whichever is reached first |
| Variable speed | At least 19 kW, but less than 37 kW | Any speed | 5,000 hours or seven years, whichever is reached first |
| Variable speed or constant speed | 37kW or higher | Any speed | 8,000 hours or ten years, whichever is reached first |

(2) You may request a shorter useful life for an engine family if you have documentation from in-use engines showing that these engines will rarely operate longer than the alternate useful life. The useful life value may not be shorter than any of the following:

(i) 1,000 hours of operation.

(ii) Your recommended overhaul interval.

(iii) Your mechanical warranty for the engine

(h) Applicability for testing. The emission standards in this subpart apply to all testing, including selective enforcement audits and in-use testing.

**§1039.103 What smoke standards must my engines meet?**

Your engines must have less than 22 percent opacity when measured with the smoke test procedure in §1039.501 throughout its useful life.

**§1039.105 What evaporative emissions standards and requirements apply?**

There are no evaporative emission standards for diesel-fueled engines, or engines using other nonvolatile or nonliquid fuels (e.g., natural gas). If your engine uses a volatile liquid fuel, such as methanol, you must meet the evaporative emission requirements of part 1048 of this chapter that apply to SI engines.

**§1039.110 How must my engines diagnose malfunctions? [Reserved]**

**§1039.115 What other requirements must my engines meet?**

Your engines must meet the following requirements:

(a) Closed crankcase. Your engines may not vent crankcase emissions into the atmosphere throughout their useful life, with the following exception: your engines may vent crankcase emissions if you measure and include these crankcase emissions with all measured exhaust emissions. Note: If you choose to use the exception to vent crankcase emissions, you must account for this when determining and applying your deterioration factors.

(b) Torque broadcasting. [Reserved]

(c) EPA access to broadcast information. If we request it, you must provide us any hardware or tools we would need to readily read, interpret, and record all information broadcast by an engine's on-board computers and electronic control modules. If you broadcast a surrogate parameter for torque values, you must provide us what we need to convert these into torque units. We will not ask for hardware or tools if they are readily available commercially.

(d) Emission sampling capability. Produce all your engines to allow sampling of exhaust emissions in the field without damaging the engine or equipment. Show in your application for certification how this can be done in a way that prevents diluting the exhaust sample with ambient air. To do this, you might simply allow for extending the exhaust pipe by 20 cm; you might also install exhaust ports downstream of any aftertreatment devices.

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

(1) We do not consider an operating parameter adjustable if you permanently seal it or if ordinary tools cannot readily access it.

(2) We may require that you set adjustable parameters to any specification within the adjustable range during any testing, including certification testing, selective enforcement auditing, or in-use testing.

(f) 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.

(g) Defeat devices. You may not equip your engines with a defeat device. A defeat device is any device, system, or element of design which senses operation outside normal emission test conditions and reduces emission control effectiveness. This includes any auxiliary emission-control device that reduces the effectiveness of emission controls

under conditions you may reasonably expect the engine to encounter during normal operation and use, except for auxiliary emission-control devices that you identify in your certification application if any of the following is true:

(1) The conditions of concern were substantially included in the applicable test procedures described in subpart F.

(2) You show your design is necessary to protect the engine (or equipment) from damage or accident during its operation.

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

**§1039.120 What warranty requirements apply to me?**

(a) General requirements. You must warrant to the ultimate buyer that the new nonroad engine meets two conditions:

(1) It is designed, built, and equipped it to conform at the time of sale 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 for at least as long as the minimum warranty periods listed in the paragraph in hours of operation and years, whichever is reached first. You may offer an emission-related warranty more generous than we require. This emission-related warranty may not be shorter than any published or negotiated warranty you offer for the engine or any of its components. 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 minimum warranty periods are shown in the following table:

| If your engine is certified as . . . | And your rated power is . . . | And your rated speed is . . . | Your useful life is . . . |
|---|---|---|---|
| Variable speed or constant speed | Less than 19 kW | Any speed | 1,500 hours or five years, whichever is reached first |
| Constant speed | At least 19 kW, but less than 37 kW | 3,000 rpm or higher | 1,500 hours or two years, whichever is reached first |
| Constant speed | At least 19 kW, but less than 37 kW | Less than 3,000 rpm | 3,000 hours or five years, whichever is reached first |
| Variable speed | At least 19 kW, but less than 37 kW | Any speed | 3,000 hours or five years, whichever is reached first |
| Variable speed or constant speed | 37kW or higher | Any speed | 3,000 hours or five years, whichever is reached first |

(c) Components covered. The emission-related warranty must cover components whose failure would increase an engine's emissions, including electronic controls, fuel injection, exhaust-gas recirculation, aftertreatment, or any other system you develop to control emissions. We generally consider replacing or repairing other components to be the owner's responsibility.

(d) Scheduled maintenance. You may schedule emission-related maintenance for a component named in paragraph (c) of this section, subject to the restrictions of §1039.125. You are not required to cover this scheduled maintenance under your emission-related warranty if the component meets either of the following criteria:

(1) The component was in general use on similar engines, and was subject to scheduled maintenance, before January 1, 1990.

(2) Failure of the component would clearly degrade the engine's performance enough that the operator would need to repair or replace it.

(e) Limited applicability. You may deny warranty claims under this section if the operator caused the problem, as described in 40 CFR 1068.115.

(f) Aftermarket parts. As noted 40 CFR 1068.101, it is a violation of the Act to manufacture an engine part if one of its main effects is to reduce the effectiveness of the engine's emission controls. If you make an aftermarket part, you may—but do not have to—certify that using the part will still allow engines to meet emission standards, as described in 40 CFR 85.2114.

**§1039.125 What maintenance instructions must I give to buyers?**

Give the ultimate buyer of each new nonroad engine written instructions for properly maintaining and using the engine, including the emission-control system. The maintenance instructions also apply to service accumulation on your test engines, as described in 40 CFR part 1065, subpart E.

(a) Critical emission-related maintenance. Critical emission-related maintenance includes any adjustment, cleaning, repair, or replacement of air-induction, fuel-system, or ignition components, aftertreatment devices, exhaust gas recirculation systems, crankcase ventilation valves, sensors, or electronic control units. This may also include any other component whose only purpose is to reduce emissions or whose failure will increase emissions without significantly degrading engine performance. You may schedule critical emission-related maintenance on these components if you meet the following conditions:

(1) You may ask us to approve critical emission-related maintenance only if it meets two criteria:

(i) Operators are reasonably likely to do the maintenance you call for.

(ii) Engines need the maintenance to meet emission standards.

(2) We will accept scheduled maintenance as reasonably likely to occur in use if you satisfy any of four conditions:

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

(ii) You present survey data showing that 80 percent of engines in the field get the maintenance you specify at the recommended intervals.

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

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

(3) You may not schedule emission-related maintenance on the following components more frequently than the minimum intervals specified in the following table, except as specified in paragraph (a)(5) of this section:

| For the following components . . . | If your rated power is . . . | The minimum interval is . . . |
|---|---|---|
| EGR-related filters and coolers<br><br>PCV valves<br><br>Fuel injector tips (cleaning only) | Any power | 1,500 hours. |
| Fuel injectors<br><br>Turbochargers<br><br>Electronic engine control units (and associated sensors and actuators)<br><br>Particulate traps, trap oxidizers, and related components) (cleaning and repair only)<br><br>EGR system (including related components, but excluding filters and coolers)<br><br>Catalytic converters<br><br>Other add-on emission-related components | Less than 130 kW | 3,000 hours. |
| | 130 kW or higher | 4,500 hours. |

(5) If your engine family has an alternate useful life shorter than the period specified in paragraph (a)(4) of this section, you may not schedule maintenance on those components more frequently than the alternate useful life (see §1039.101(g)).

(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 make clear 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 them from in-use testing or deny a warranty claim.

(c) Special maintenance. You may specify more frequent maintenance to address problems related to special situations, such as atypical engine operation.

(d) Noncritical emission-related maintenance. For engine parts not listed in paragraph (a) of this section, you may schedule any amount of emission-related inspection or maintenance. But you must state clearly that these steps are not necessary to keep the emission-related warranty valid. Also, do not take these inspection or maintenance steps during service accumulation on your test 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 test vehicles or engines. This might include adding engine oil, changing air, fuel, or oil filters, cooling system maintenance, adjustment of idle speed, governor, engine bolt torque, valve lash, injector lash, timing, or lubrication of the exhaust manifold heat control valve. This nonemission-related maintenance may be performed on durability vehicles at the least frequent intervals that you recommend to the ultimate purchaser (not the intervals recommended for severe service).

(f) Source of parts and repairs. Print clearly on the first page of your written maintenance instructions that any repair shop or person 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 vehicle be serviced by your franchised dealers or any other service establishments with which you have a commercial relationship.

You may disregard the requirements in this paragraph (f) if you do one of two things:

(1) Provide a component or service without charge under the purchase agreement.

(2) Get us to waive this prohibition in the public's interest by convincing us the engine will work properly only with the identified component or service.

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

(a) If you sell an engine for someone else to install in a piece of nonroad equipment, give the buyer of the engine written instructions for installing it consistent with the requirements of this part. Include all information necessary to ensure that engines installed this way will meet emission standards.

(b) Make sure these 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 a piece of nonroad equipment violates federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.".

(3) Describe any other instructions needed to install an exhaust aftertreatment device and to locate exhaust sampling ports consistent with your application for certification.

(4) [Reserved]

(5) Describe any limits on the range of applications needed to ensure that the engine operates consistently with your application for certification. For example, if your engines are certified only for constant-speed operation, tell equipment manufacturers not to install the engines in variable-speed applications.

(7) Describe any other instructions to make sure the installed engine will operate according to design specifications in your application for certification.

(8) 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 vehicle, as described in 40 CFR 1068.105.".

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

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

(a) Assign each production engine a unique identification number and permanently and legibly affix, engrave, or stamp it on the engine.

(b) At the time of manufacture, add a permanent emission control information label identifying each engine. To meet labeling requirements, do four things:

(1) Attach the label in one piece so it is not removable without being destroyed or defaced.

(2) Design and produce it to be durable and readable for the engine's entire life.

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

(4) Write it in block letters in English.

(c) On your engine's emission control information label, do 13 things:

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

(2) Include your full corporate name and trademark.

(3) State: "THIS ENGINE IS CERTIFIED TO OPERATE ON [specify operating fuel or fuels].".

(4) Identify the emission-control system; your identifiers must use names and abbreviations consistent with SAE J1930 (incorporated by reference in §1039.810).

(5) List all requirements for fuel and lubricants.

(6) State the date of manufacture [DAY (optional), MONTH, and YEAR]; if you stamp this information on the engine and print it in the owner's manual, you may omit it from the emission control information label.

(7) State: "THIS ENGINE MEETS U.S. ENVIRONMENTAL PROTECTION AGENCY REGULATIONS FOR [MODEL YEAR] LARGE NONROAD COMPRESSION-IGNITION ENGINES.".

(8) Include EPA's standardized designation for the engine family (and subfamily, where applicable).

(9) State the engine's displacement (in liters) and maximum brake power.

(10) State the engine's useful life (see §1039.101(g)).

(11) List specifications and adjustments for engine tuneups; show the proper position for the transmission during tuneup and state which accessories should be operating.

(12) Describe other information on proper maintenance and use.

(d) Some of your engines may need more information on the emission control information label.

(1) If you have an engine family that has been certified only for constant-speed engines, add to the engine label "CONSTANT-SPEED ONLY".

(2) If you have an engine family that has been certified only for constant-torque engines, add to the engine label "CONSTANT-TORQUE ONLY".

(3) If you certify an engine to the voluntary standards in §1039.140, add to the engine label "BLUE SKY SERIES".

(5) If you produce an engine we exempt from the requirements of this part, see subpart G of this part and 40 CFR part 1068, subparts C and D, for more label information.

(e) Some engines may not have enough space for an emission control information label with all the required information. In this case, you may omit the information required in paragraphs (c)(3), (c)(4), (c)(5), and (c)(12) of this section if you print it in the owner's manual instead.

(f) Label both the engine and equipment to indicate the maximum allowable sulfur level of the fuel, as described in your application for certification.

(1) The label should state either:

(i) "ULTRA LOW-SULFUR NONROAD DIESEL FUEL OR ON-HIGHWAY DIESEL FUEL ONLY (15 parts per million)"; or

(ii) "LOW-SULFUR NONROAD DIESEL FUEL, ULTRA LOW-SULFUR NONROAD DIESEL FUEL, OR ON-HIGHWAY DIESEL FUEL ONLY (500 ppm maximum)".

(2) The equipment must be labeled near the fuel inlet. If you manufacturer the engine, but not the equipment,

provide the appropriate label to the equipment manufacturer and notify the equipment manufacturer in the installation instructions. Optionally, if the equipment manufacturer chooses to install its own label, you are not required to provide the label.

(g) If you are unable to meet the labeling requirements, you may ask us to modify them consistent with the intent of this part.

**§1039.145 What provisions apply only for a limited time?**

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

(a) Transition from 40 CFR part 89. This part 1039 applies for Tier 4 engines. Engines subject to earlier tiers of standards (i.e., Tier 1, Tier 2, and Tier 3 engines) are regulated in 40 CFR part 89. You may choose to certify Tier 2 or Tier 3 engine families to the standards listed 40 CFR 89.112 according to the provisions of this part 1039. If you choose this option for an engine family, then you must comply with all of the requirements of this part 1039 for the engines in that engine family, except the following:

(1) NTE standards do not apply.

(2) The transient test procedures do not apply.

(b) Interim Tier 4 standards and phase-in. At the start of the Tier 4 program, interim emission standards and a phase-in schedule apply for certain model years instead of the numerical standards specified in §1039.101 (a) and (b). For each power category, the model years in which the interim standards and phase-in schedule apply is called the phase-in period. The emission standards and phase-in schedule are shown in the following table:

| Interim Exhaust Emissions Standards | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Engine Power | Emissions Standard g/kW-hr | | | | | | | Model Years for which interim Tier 4 standards apply |
| | PM | | NOx | | NMHC | | CO | |
| 19 ≤ kW < 37 | 0.30 | | 7.5 (NMHC+NOx) | | | | 5.0 | 2008-2012 |
| 37 ≤ kW < 56 | 0.30 | | 4.7 (NMHC+NOx) | | | | 5.0 | 2008-2012 |
| 56 ≤ kW < 75 (Phase-in percentage) | 0.020 | | 0.40 (50%) | 4.7[a] (50%) | 0.19 (50%) | 4.7[a] (50%) | 5.0 | 2012-2013 |
| 75 ≤ kW < 130 (Phase-in percentage) | 0.020 | | 0.40 (50%) | 4.0[a] (50%) | 0.19 (50%) | 4.0[a] (50%) | 5.0 | 2012-2013 |
| 130 ≤ kW ≤ 560 (Phase-in percentage) | 0.020 | | 0.40 (50%) | 4.0[a] (50%) | 0.19 (50%) | 4.0[a] (50%) | 3.5 | 2011-2013 |
| kW > 560 (Phase-in percentage) | 0.020 (50%) | 0.20 (50%) | 0.40 (50%) | 6.4[a] (50%) | 0.19 (50%) | 6.4[a] (50%) | 3.5 | 2011-2013 |

a Phase-out standard for this power category is for NMHC+NOx

(1) The phase-in percentages listed in the table specify the fraction of your total production (for that power category) that must comply with the specified interim Tier 4 standard during the model years listed. Where phase-in percentage apply the table shows the phase-in and phase-out standards in two subcolumns. If no phase-in percentage is listed in the table for a standard, then all of your engines must comply with the specified interim Tier 4 standard during the model years listed.

(2) The interim standards listed in the table for engine families rated 37-56 kW are optional. If you choose to comply with the interim standards for these engines families for the entire phase-in period, then you are not required to meet the final Tier 4 PM standards in §1039.101 until model year 2013.

(3) NTE standards are calculated for these interim periods using the equation specified in §1039.101(d) with the interim standards specified.

(4) All other Tier 4 standards and requirements apply for your engines during these interim periods. The standards specified in this paragraph (b) apply with respect to emissions measured according to the test procedures specified in subpart F of this part, except as specified in paragraph (c) of this section. Phase-out engines participating in the ABT program are subject to the restrictions applicable for the previous tier of standards.

(c) Transient and NTE testing. The transient and NTE emission standards in §1039.101(a) and (d) do not apply for engines below 37 kW through the 2012 model year, or for phase-out engines rated over 560 kW.

(d) Smoke standards. You may meet the smoke standards in 40 CFR 89.113 instead of the standards in §1039.103 through the 2008 model year. If you meet the smoke standards in 40 CFR 89.113, use the test procedures in that

section.

(e) Split Families. For the purpose of using or generating credits during the phase-in of Tier 4 standards, you may choose to split an engine family into two subfamilies (e.g., one which uses credits and one which generates credits). You must indicate in the application for certification that the engine family is to be split, and may assign the numbers and configurations of engines within the respective subfamilies at any time prior to the submission of the end-of-year report. This option is not available for engine families under 56 kW.

(1) You may exclude the engines within the split family from end-of-year NOx (or NOx+NMHC) ABT calculations, provided that neither subfamily generates credits for use by other engine families, or uses banked credits, or uses averaging credits from other engine families. All of the engines in that split family must be excluded from the phase-in calculations (both from the number of engines complying with the Tier 4 emission standards being phased-in and from the total number of U.S.-directed production engines).

(2) Label all of the engines within the family with a single NOx FEL, as listed in the following table:

| If the power rating of the engine family is . . . | Then your NOx FEL for the entire family is . . . |
|---|---|
| (i) At least 56 kW, but less than 130 kW | 2.3 g/kW-hr. |
| (ii) At least 130 kW, but less than 560 kW | 2.0 g/kW-hr. |
| (iii) 560 kW or higher | 3.1 g/kW-hr. |

(3) For split families rated over 560 kW, your PM FEL is 0.10.

(4) Your engines must comply with all other standards and requirements applicable to Tier 4 engines.

(f) Incentives for early introduction. You may reduce the number of engines that are required to meet the standards in §1039.101 (or paragraph (b) of this section) by certifying engines to the applicable standards in §1039.101 (without using credits) prior to the model year otherwise required (either by §1039.101 or paragraph (b) of this section). This option begins in model year 2008.

(1) For engines with rated power at 56 kW or higher:

| If you certify . . . | To the . . . | You may reduce the number of engines in the same power category that are required to meet the . . . | In later model years by . . . |
|---|---|---|---|
| Two engines | 0.020 g/kW-hr PM standard | 0.020 g/kW-hr PM standard | Three engines |
| Two engines | 0.020 g/kW-hr PM standard, the 0.40 g/kW-hr NOx standard, and the 0.19 g/kW-hr NMHC standard | 0.020 g/kW-hr PM standard, the 0.40 g/kW-hr NOx standard, and the 0.19 g/kW-hr NMHC standard | Three engines |
| One engine | 0.020 g/kW-hr PM standard, a 0.20 g/kW-hr | 0.020 g/kW-hr PM standard, the 0.40 g/kW- | Two engines |

(2) For engines with rated power less than 56 kW:

| If you certify . . . | To a . . . | You may reduce the number of engines in any with rated power between 19kW and 56kW that are required to meet the . . . | In later model years by . . . |
|---|---|---|---|
| Two engines | 0.034 g/kW-hr PM standard | 0.034 g/kW-hr PM standard | Three engines |

(3) Example: If you produce 100 56-130 kW engines in 2008 that meet all of the applicable the standards listed in §1039.101, and you produced 10,000 56-130 kW engines in 2012, then only 9,850 of the engines would need to comply with the standards listed in §1039.101 in 2012.

(g) You may initially base compliance with the phase-in requirements of paragraph (b) of this section on projected U.S.-directed production estimates. This is allowed for all phase-in model years, except the last year in which less than 100 percent compliance is required. However, if your actual U.S. directed production volume of engines that comply with the Tier 4 standards is less than the required amount, you must make up the shortfall (in terms of number of engines) prior to the end of the phase-in period. For example, if you plan in good faith to produce 50 percent of your projected 10,000 56-130kW engines (i.e., 5,000 engines) in 2012 in compliance with the Tier 4 NOx and NMHC standards, but are only able to produce 4,500 such engines of an actual 10,000 engines, you would need to produce an extra 500 engines in 2013 in compliance with the Tier 4 NOx and NMHC standards. The deficit allowed by this paragraph (f) may not exceed 25 percent of your U.S. directed production volume.

(h) (1) For purposes of determining compliance after title or custody has transferred to the ultimate purchaser, for engines having a NOx FEL no higher than 2.0 g/kW-hr, the applicable compliance limit shall be determined by adding the following adjustment to the otherwise applicable standard or FEL for NOx.

| In model years . . . | If you engine power is . . . | The NOx adjustment in g/kW-hr is . . . |
|---|---|---|
| 2012-2015 | $56 \leq$ kW < 130 | 0.13 for operating hours $\leq$ 4000<br>0.27 for operating hours > 4000 |
| 2011-2015 | kW $\geq$ 130 | 0.13 for operating hours $\leq$ 4000<br>0.27 for operating hours > 4000 |

(2) For model years prior to 2014 for engines rated less than 56 kW, and model years prior to 2015 for engines rated at 56 kW or higher, for purposes of determining compliance after title or custody has transferred to the ultimate purchaser, the applicable compliance limit shall be determined by adding 0.013 g/kW-hr to the otherwise applicable standard or FEL for PM.

(i) Provisions for small-volume manufacturers. Special provisions apply to you if you are a small-volume engine manufacturer subject to the requirements of this part. You must contact us before 2008 if you intend to use these provisions.

(1) You may delay complying with the following otherwise applicable Tier 4 emission standards for three model years:

(i) PM standard for engines rated less than 19 kW.

(ii) NMHC+NOx standard for engines rated at least 19 kW but less than 37 kW.

(ii) NMHC+NOx and PM standards for engines rated at least 56 kW but less than 130 kW.

(2) For engines rated at least 19 kW but less than 56 kW, if you choose to meet the interim PM standard in paragraph (b) of this section by model year 2011 (without using PM credits), you may delay complying with the Tier 4 PM standard in §1039.101 for engines rated at least 19 kW but less than 56 kW for three model years.

(j) FEL caps for interim period.

| Interim Tier 4 FEL Caps for Phase-In Engines | | | |
|---|---|---|---|
| Engine Power | Emission g/kW-hr | | |
| | PM | NOx | NMHC+NOx |
| 19 ≤ kW < 37 | 0.60 | - | 9.5 |
| 37 ≤ kW < 56 | 0.40 | - | 7.5 |
| 56 ≤ kW < 75 | 0.040 | 4.4 | - |
| 75 ≤ kW ≤ 560 | 0.040 | 3.7 | - |
| kW > 560 | 0.20 | 6.1 | - |

| Interim Tier 4 FEL Caps for Phase-Out Engines | | |
|---|---|---|
| Engine Power | Emissions Standard g/kW-hr | |
| | PM | NMHC+NOx |
| 56 ≤ kW < 75 | 0.040 | 7.5 |
| 75 ≤ kW < 225 | 0.040 | 6.6 |
| 225 ≤ kW < 560 | 0.040 | 6.4 |
| kW ≥ 560 | 0.54 | 10.5 |

(k) Deficiencies for NTE emission standards. (1) For the first three model years during which Tier 4 standards apply for your engines, you may ask us to accept a HDDE as compliant with the NTE standards even though specific requirements are not fully met. We will grant such deficiencies (i.e., compliance without meeting specific requirements) only if compliance would be infeasible or unreasonable considering such factors as, but not limited to: technical feasibility of the given hardware and lead time and production cycles including phase-in or phase-out of

engines or vehicle designs and programmed upgrades of computers. We will approve deficiencies on a engine model and/or horsepower rating basis within an engine family, and each approval is applicable for a single model year. Your request must include a description of the auxiliary emission control device(s) which will be used to maintain emissions to the lowest practical level, considering the deficiency being requested, if applicable. An application for a deficiency must be made during the certification process; no deficiency will be granted to retroactively cover engines already certified.

(2) For the next four model years after the period covered by paragraph (k)(1) of this section, we may allow up to three deficiencies per engine family. The provisions of paragraphs (k)(1) of this section apply for deficiencies allowed by this paragraph (2). In determining whether to allow the additional deficiencies, we may consider any relevant factors, including the factors identified in paragraph (k)(1) of this section. If we approve additional deficiencies, we may set any additional conditions that we determine to be appropriate.

(3) Unmet requirements should not be carried over from the previous model year except where unreasonable hardware or software modifications would be necessary to correct the deficiency, and we determine that you have demonstrated an acceptable level of effort toward compliance. The NTE deficiency should only be seen as an allowance for minor deviations from the NTE requirements. The NTE deficiency provisions allow you to apply for relief from the NTE emission requirements under limited conditions. We expect that you should have the necessary functioning emission control hardware in place to comply with the NTE.

**Subpart C—Certifying Engine Families**

**§1039.201 What are the general requirements for submitting a certification application?**

(a) Send us an application for a certificate of conformity for each engine family. Each application is valid for only one model year.

(b) The application must not include false or incomplete statements or information (see §1039.255).

(c) We may choose to ask you to send us less information than we specify in this subpart, but this would not change your recordkeeping requirements.

(d) Use good engineering judgment for all decisions related to your application (see 40 CFR 1068.5).

(e) An authorized representative of your company must approve and sign the application.

**§1039.205 What must I include in my application?**

In your application, do all the following things unless we ask you to send us less information:

(a) Describe the engine family's specifications and other basic parameters of the engine's design. List the types of fuel you intend to use to certify the engine family (for example, diesel fuel).

(b) Explain how the emission-control systems operate. Describe in detail all the system components for controlling exhaust emissions, including auxiliary emission-control devices and all fuel-system components you will install on any production or test engine. Explain why any auxiliary emission-control devices are not defeat devices (see §1039.115(g)). Do not include detailed calibrations for components unless we ask for them. Each application must include:

(1) A general overview of the engine and the emission control strategies and AECDs employed;

(2) A general description of the purpose and function of each AECD;

(3) The parameters that are sensed (measured) or estimated (calculated or empirically determined) by each AECD;

(4) The purpose for every parameter sensed or estimated;

(5) The location of the sensors used for each sensed parameter;

(6) The threshold values for the sensed/estimated parameters which activate the AECD;

(7) The parameters modulated (controlled) in response to the sensed/estimated parameter(s) including the range of modulation for each parameter, a description of the relationship between the sensed/estimated parameters and the controlled parameters (graphs and tables as necessary), and an explanation of how the modulation achieves the stated purpose for the AECD;

(8) Specific calibration details for each AECD specific to the engine family (may be in the form of data tables, graphical representations or other description);

(9) The hierarchy among the AECDs when multiple AECDs sense or modulate the same parameter(s) including whether the strategies interact in a comparative or additive manner, and the AECD which takes precedence in responding;

(10) An explanation of the extent to which the AECD is substantially included in the applicable Federal Test Procedure, if applicable;

(11) Additionally for engine or equipment protection AECDs:

(i) The engine and/or equipment design limit(s) which necessitate protection and a description of any engine damage that would occur in the absence of the AECD;

(ii) A description of how each parameter sensed or estimated relates to the design limits for the engine and/or equipment components being protected or those operating conditions that cause the need for protection;

(iii) The relationship between the design limits/parameters being protected and those being sensed or calculated as surrogates for the design limits/parameters, if applicable;

(iv) How the modulation prevents engine and/or equipment design limits from being exceeded;

(v) For estimated parameters, an explanation of why an estimate is necessary and how the estimate is calculated.

(vi) A description of the extent to which the AECD modulation is calibrated to activate only during conditions that give rise to the AECD's stated need, and the extent to which the modulation is the minimum necessary to accomplish the stated need;

(c) [Reserved]

(d) Describe the engines you selected for testing and the reasons for selecting them.

(e) Describe any special or alternate test procedures you used (see §1039.501).

(f) Describe how you operated the engine or vehicle prior to testing, including the duty cycle and the number of engine operating hours used to stabilize emission levels. 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 40 CFR part 1065, subpart C.

(h) Identify the engine family's useful life.

(i) Propose maintenance and use instructions for the ultimate buyer of each new nonroad engine (see §1039.125).

(j) Propose emission-related installation instructions if you sell engines for someone else to install in a piece of nonroad equipment (see §1039.130).

(k) Propose an emission control information label.

(l) Present emission data to show that you meet the applicable emission standards. Present emission data for HC, NOx, and CO on a test engine to show your engines meet the duty-cycle emission standards we specify in §1039.101. Show these figures before and after applying deterioration factors for each engine. Identify the emission standards or FELs to which you are certifying engines in the engine family. Include test data for each type of fuel from 40 CFR part 1065, subpart C, on which you intend for engines in the engine family to operate. If we specify more than one grade of any fuel type (for example, a summer grade and winter grade of gasoline), you only need to submit test data for one grade, unless the regulations of this part specify otherwise for your engine. Note that §1039.235 allows you to submit an application in certain cases without new emission data.

(m) Report all test results, including those from invalid tests or from any nonstandard tests (such as measurements based on exhaust concentrations in parts per million).

(n) Identify the engine family's deterioration factors and describe how you developed them (see §1039.520). Present any emission test data you used for this.

(o) Describe all adjustable operating parameters (see §1039.115(e)), including the following:

(1) The nominal or recommended setting.

(2) The intended physically adjustable range, including production tolerances if they affect the range.

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

(p) Describe everything we need to read and interpret all the information broadcast by an engine's onboard computers and electronic control modules and state that you will give us any hardware or tools we would need to do

this. You may reference any appropriate publicly released standards that define conventions for these messages and parameters. Format your information consistent with publicly released standards.

(q) State whether your engines will be limited to constant-speed or constant-torque applications. If your certification is limited to constant-speed or constant-torque applications, describe how you will prevent use of these engines in the applications for which they are not certified.

(r) State that all the engines in the engine family comply with the not-to-exceed emission standards we specify in §1039.101 for all normal operation and use (see §1039.515). Describe in detail any testing, engineering analysis, or other information on which you base this statement.

(s) State that you operated your test engines according to the specified procedures and test parameters using the fuels described in the application to show you meet the requirements of this part.

(t) State unconditionally that all the engines in the engine family comply with the requirements of this part, other referenced parts, and the Clean Air Act.

(u) Include estimates of U.S.-directed production volumes.

(v) Show us how to modify your production engines to measure emissions in the field (see §1039.115(d)).

(w) Include the information required by §1039.730, if you participate in the ABT program in subpart H of this part.

(x) Add other information to help us evaluate your application if we ask for it.

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

If you send us information before you finish the application, we will review it and make any appropriate determinations listed in §1039.215(b)(1) through (7). Decisions made under this section are considered to be preliminary approval. We will generally not disapprove applications under §1039.215(b)(1) through (5) where we have given you preliminary approval, unless we find new and substantial information supporting a different decision.

(a) If you request preliminary approval related to the upcoming model year or the model year after that, we will make a "best-efforts" attempt to make the appropriate determinations as soon as possible. We will generally not provide preliminary approval related to a future model year more than two years ahead of time.

(b) You may consider full compliance with published guidance to be preliminary approval only if the guidance includes a statement that we intend you to consider it as such.

**§1039.215 What happens after I complete my application?**

(a) If any of the information in your application changes after you submit it, amend it as described in §1039.225.

(b) We may deny your application (that is, determine that we cannot approve it without revision) if the engine family does not meet the requirements of this part or the Act. For example:

(1) If you inappropriately use the provisions of §1039.230(c) or (d) to define a broader or narrower engine family, we will require you to redefine your engine family.

(2) If we determine you did not appropriately select the useful life under §1039.101(g), we will require you to lengthen it.

(3) If we determine you did not appropriately select deterioration factors under §1039.240(c), we will require you to revise them.

(4) [Reserved]

(5) [Reserved]

(6) If your proposed emission control information label is inconsistent with §1039.135, we will require you to change it (and tell you how, if possible).

(7) If you require or recommend maintenance and use instructions inconsistent with §1039.125, we will require you to change them.

(8) If we find any other problem with your application, we will tell you what the problem is and what needs to be corrected.

(c) If we determine your application is complete and shows that the engine family meets all the requirements of this part and the Act, we will issue a certificate of conformity for your engine family for that model year. If we deny the application, we will explain why in writing. You may then ask us to hold a hearing to reconsider our decision (see §1039.820).

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

Send the Designated Compliance Officer a 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.

(a) If you are decreasing the specified level of maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. We may approve a shorter time or waive this requirement.

(b) If your requested change would not decrease the specified level of maintenance, you may distribute the new maintenance instructions anytime after you send your request.

(c) If you are correcting or clarifying your maintenance instructions or if you are changing instructions for maintenance unrelated to emission controls, the requirements of this section do not apply.

**§1039.225 How do I amend my application to include new or modified engines?**

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

(1) Add an engine to a certificate of conformity.

(2) Make a design change for a certified engine family that may affect emissions or an emission-related part over the engine's lifetime.

(b) Send the Designated Compliance Officer a request to amend the application for certification for an engine family. In your request, do all of the following:

(1) Describe the engine model or configuration you are adding or changing.

(2) Include engineering evaluations or reasons why the original test engine is or is not still appropriate.

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

(c) You may start producing the new or modified nonroad engine anytime after you send us your request. If we determine that the affected engines do not meet applicable requirements, we will require you to cease production of the engines and to recall and correct the engines at no expense to the owner. If you choose to produce engines under this paragraph (c), we will consider that to be consent to recall all engines that we determine do not meet applicable emission standards or other requirements and to remedy the nonconformity at no expense to the owner.

(d) You must give us test data within 30 days if we ask for more testing, or stop producing the engine if you cannot do this. You may give us an engineering evaluation instead of test data if we agree that you can address our questions without test data.

(e) If we determine that the certificate of conformity would not cover your new or modified nonroad engine, we will send you a written explanation of our decision. In this case, you may no longer produce these engines, though you

may ask for a hearing for us to reconsider our decision (see §1039.820).

**§1039.230 How do I select engine families?**

(a) Divide your product line into families of engines that you expect to have similar emission characteristics. Your engine family is limited to a single model year.

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

(1) The combustion cycle and fuel.

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

(3) Method of air aspiration.

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

(5) Combustion chamber design.

(6) Bore and stroke.

(7) Number of cylinders, (engines with aftertreatment devices only); and

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

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

(10) Rated power category.

(c) In some cases you may subdivide a group of engines that is identical under paragraph (b) of this section into different engine families. To do so, you must show you expect emission characteristics to be different during the useful life.

(d) If your engines are not identical with respect to the things listed in paragraph (b) of this section, but you show that their emission characteristics during the useful life will be similar, we may approve grouping them in the same engine family.

(e) If you cannot appropriately define engine families by the method in this section, we will define them based on features related to emission characteristics.

**§1039.235 What emission testing must I perform for my application for a certificate of conformity?**

This section describes the emission testing you must perform to show compliance with the emission standards in §1039.101. See §1039.205(r) regarding emission testing related to the NTE emission standards.

(a) Test your emission-data engines using the procedures and equipment specified in subpart F of this part.

(b) Select from each engine family a test engine for each fuel type with a configuration that is most likely to exceed the applicable emission standards, using good engineering judgment. Consider the emission levels of all exhaust constituents over the full useful life of the engine when operated in a piece of equipment.

(c) You may use previously generated emission data in either of the following cases:

(1) You may submit emission data for equivalent engine families from previous years instead of doing new tests, but only if the data show that the test engine would meet all the requirements for the latest engine models. We may require you to do new emission testing if we believe the latest engine models could be substantially different from the previously tested engine.

(2) You may submit emission data for equivalent engine families performed to show compliance with other emission standards (such as international emission standards) instead of doing new tests, but only if the data show that the test engine would meet all of this part's requirements.

(d) We may choose to measure emissions from any of your test engines (or other engines from the engine family).

(1) If we do this, you must provide the test engine at the location we select. We may decide to do the testing at

your plant or any other facility. If we choose to do the testing at your plant, you must schedule it as soon as possible and make available the instruments and equipment we need.

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

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

(4) Calibrate the test engine within normal production tolerances for anything we do not consider an adjustable parameter (see §1039.205(p)).

(e) You may ask us to waive the requirement to provide smoke emission data for the following engines:

(1) Constant-speed engines.

(2) Constant-torque engines.

(3) Single-cylinder engine.

(4) Engines having certified PM emissions or a PM FEL less than 0.07 g/kW-hr.

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

(a) For certification, your engine family is considered in compliance with the applicable numerical emission standards in §1039.101 if all emission-data engines representing that family have test results showing emission levels at or below these standards. (Note: if you participate in the ABT program in subpart H of this part, your FELs are considered to be applicable emission standards with which you must comply.)

(b) Your engine family does not comply if any emission-data engine representing that family has test results showing emission levels above any applicable emission standard from §1039.101 for any pollutant.

(c) To compare emission levels from the test engine with the applicable emission standards, apply deterioration factors (to four significant figures) to the measured emission levels. The deterioration factor is a number that shows the relationship between exhaust emissions at the end of useful life and at the low-hour test point. Section 1039.520 specifies how to test your engine to develop deterioration factors that estimate the change in emissions over your engines' full useful life. Your deterioration factors must be consistent with emission increases observed from any in-use testing with similar engines. Small-volume engine manufacturers may use assigned deterioration factors that we establish. Apply the deterioration factors as follows:

(1) If you use aftertreatment technology (other than particulate traps) to control emissions of a pollutant, the deterioration factor for that pollutant is the ratio of exhaust emissions at the end of useful life to exhaust emissions at the low-hour test point. Adjust the official emission results for each tested engine at the selected test point by multiplying the measured emissions by the deterioration factor. If the factor is less than one, use one.

(2) If you use do not use aftertreatment technology to control emissions of a pollutant, the deterioration factor for that pollutant is the difference between exhaust emissions at the end of useful life and exhaust emissions at the low-hour test point. Adjust the official emission results for each tested engine at the selected test point by adding the factor to the measured emissions. If the factor is less than zero, use zero.

(3) For engines that use particulate traps, you may calculate the deterioration factor for PM as either a multiplicative factor under paragraph (c)(1) of this section or an additive factor under paragraph (c)(2) of this section.

(4) If your engine vents crankcase emissions to the exhaust or to the atmosphere, you must account for

crankcase emission deterioration, using good engineering judgment. You may use separate factors for crankcase emissions (either multiplicative or additive) or include the effects in combined exhaust and crankcase factors.

(d) After adjusting the emission levels for deterioration, round them to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each test engine.

(e) For NMHC emissions, you may choose base compliance on total hydrocarbon (THC) emissions. Indicate in your application for certification if you are using this option. If you do, calculate NMHC emissions as 98 percent of THC emissions:

NMHC = (0.98) × (THC).

**§1039.250 What records must I keep or send to EPA?**

(a) Within 30 days after the end of the model year. send the Designated Compliance Officer a report describing how many engines you produced in each engine family during the model year; divide the total number of engines by maximum brake power, total displacement, and the type of fuel system. We may also ask you to give us production figures for each assembly plant if you produce engines at more than one plant. If you produced exempted engines under the provisions of §1039.625, include in your report the number of exempted engines you produced for each engine model and identify the buyer or shipping destination for each exempted engine.

(b) Organize and maintain the following records to keep them readily available; we may review these records at any time:

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

(2) Any of the information we specify in §1039.205 that you did not include in your application.

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

(i) The test 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 emission-related components.

(ii) How you accumulated engine operating hours, 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, including documentation on routine and standard tests, as specified in part 40 CFR part 1065, and the date and purpose of each test.

(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) If we ask, you must give us projected production figures for an engine family. We may ask you to divide your production figures by maximum brake power, total displacement, or assembly plant (if you produce engines at more than one plant).

(5) Keep a list of engine identification numbers for all the engines you produce under each certificate of conformity. Give us this list within 30 days if we ask for it.

(b) Keep data from routine emission tests (such as test cell temperatures and relative humidity readings) for one year after we issue the associated certificate of conformity. Keep all other information specified in paragraph (a) of this section for eight years after we issue your certificate.

(c) 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.

(d) Send us copies of any engine maintenance instructions or explanations if we ask for them.

**§1039.255 When may EPA deny, revoke, or void my certificate of conformity?**

(a) We may deny your application for certification if your engine family fails to comply with emission standards or other requirements of this part or the Act. Our decision may be based on any information available to us showing you do not meet emission standards or other requirements, including any testing that we conduct under paragraph (f) of this section. If we deny your application, we will explain why in writing.

(b) In addition, we may deny your application or revoke your certificate if you do any of the following:

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

(2) Submit false or incomplete information (paragraph (d) of this section applies if this is fraudulent).

(3) Render inaccurate any test data.

(4) Deny us from completing authorized activities despite our presenting a warrant or court order (see 40 CFR 1068.20).

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

(c) We may void your certificate if you do not keep the records we require or do not give us information when we ask for it.

(d) We may void your certificate if we find that you intentionally submitted false or incomplete information.

(e) If we deny your application or revoke or void your certificate, you may ask for a hearing (see §1039.820). Any such hearing will be limited to substantial and factual issues.

(f) We may conduct confirmatory testing of your engines as part of certification. We may deny your application for certification or revoke your certificate if your engines fail to comply with emission standards or other requirements during confirmatory testing.

**Subpart D—[Reserved]**

**Subpart E—Testing In-use Engines [Reserved]**

**Subpart F—Test Procedures**

**§1039.501 What procedures must I use to test my engines?**

(a) Use the equipment and procedures for compression-ignition engines in 40 CFR part 1065 to show your engines meet the duty-cycle emission standards in §1039.101(a) and (b). Measure HC, NOx, PM, CO, and $CO_2$ emissions using the full-flow dilute sampling procedures in 40 CFR part 1065. Use the applicable duty cycles in §§1039.505 and 1039.510.

(b) Section 1039.515 describes the supplemental procedures for showing that your engines meet the not-to-exceed emission standards in §1039.101(c).

(c) Use the equipment and procedures in 40 CFR part 1065 to show your engines meet the smoke standards in §1039.103.

(d) Use the fuels specified in 40 CFR part 1065, subpart C, for all the testing we require in this part, except as noted in §1039.515.

(1) Use these test fuels or any commercially available fuel for service accumulation.

(2) For diesel-fueled engines, choose one of the diesel fuels in 40 CFR part 1065, subpart C for emission testing. Identify this test fuel in your application for certification and ensure that the engine and equipment are labeled consistent with your selection of the test fuel. For example, do not test with 15 ppm sulfur fuel if you intend to label your engines to allow 500 ppm sulfur fuel.

(e) You may use special or alternate procedures, as described in 40 CFR 1065.10.

(f) We may reject data you generate using alternate procedures if later testing with the procedures in 40 CFR part 1065 shows contradictory emission data.

**§1039.505 What steady-state duty cycles apply for laboratory testing?**

(a) Measure emissions by testing the engine on a dynamometer with one of the following steady-state duty cycles to show that the engine meets the steady-state standards in §1039.101(b):

(1) Use the 5-mode duty cycle described in the following table for engines from an engine family that will be used only in constant-speed applications:

Table 1 of §1039.505—
5-Mode Duty Cycle for Constant-Speed Engines[1]

| Mode Number | Engine Speed | Torque[2] | Minimum Time in mode (minutes) | Weighting Factors |
|---|---|---|---|---|
| 1 | Maximum test speed | 100 | 3.0 | 0.05 |
| 2 | Maximum test speed | 75 | 3.0 | 0.25 |
| 3 | Maximum test speed | 50 | 3.0 | 0.30 |
| 4 | Maximum test speed | 25 | 3.0 | 0.30 |
| 5 | Maximum test speed | 10 | 3.0 | 0.10 |

[1]This duty cycle is analogous to the D2 cycle specified in ISO 8178–4.
[2]The percent torque is relative to the maximum torque at maximum test speed.

(2) Use the 2-mode duty cycle described in the following table for engines from an engine family that will be used only in constant-torque applications:

Table 2 of §1039.505—
2-Mode Duty Cycle[1]

| Mode Number | Engine Speed | Observed Torque[1] | Minimum Time in mode (minutes) | Weighting Factors |
|---|---|---|---|---|
| 2 | Maximum test speed | 75 | 3.0 | 0.15 |
| 6 | Intermediate test speed | 75 | 3.0 | 0.10 |

[1]The percent torque is relative to the maximum torque at the given engine speed.

(3) Use the 6-mode duty cycle described in the following table for engines with rated power below 19 kW from an engine family that is not limited to constant-speed or constant-torque applications:

Table 3 of §1039.505—
6-Mode Duty Cycle[1]

| Mode Number | Engine Speed | Observed Torque[2] | Minimum Time in mode (minutes) | Weighting Factors |
|---|---|---|---|---|
| 1 | Maximum test speed | 100 | 3.0 | 0.09 |
| 2 | Maximum test speed | 75 | 3.0 | 0.20 |
| 3 | Maximum test speed | 50 | 3.0 | 0.29 |
| 4 | Maximum test speed | 25 | 3.0 | 0.30 |
| 5 | Maximum test speed | 10 | 3.0 | 0.07 |
| 6 | Idle | 0 | 3.0 | 0.05 |

[1]This duty cycle is analogous to the G2 cycle specified in ISO 8178–4.
[2]The percent torque is relative to the maximum torque at maximum test speed.

(4) Use the 8-mode duty cycle described in the following table for engines with rated power at or above 19 kW from an engine family that is not limited to constant-speed or constant-torque applications:

Table 4 of §1039.505—
8-Mode Duty Cycle[1]

| Mode Number | Engine Speed | Observed Torque[2] | Minimum Time in mode (minutes) | Weighting Factors |
|---|---|---|---|---|
| 1 | Maximum test speed | 100 | 3.0 | 0.15 |
| 2 | Maximum test speed | 75 | 3.0 | 0.15 |
| 3 | Maximum test speed | 50 | 3.0 | 0.15 |
| 4 | Maximum test speed | 10 | 3.0 | 0.10 |
| 5 | Intermediate test speed | 100 | 3.0 | 0.10 |
| 6 | Intermediate test speed | 75 | 3.0 | 0.10 |
| 7 | Intermediate test speed | 50 | 3.0 | 0.10 |
| 8 | Idle | 0 | 3.0 | 0.15 |

[1]This duty cycle is analogous to the C1 cycle specified in ISO 8178–4.
[2]The percent torque is relative to the maximum torque at the given engine speed.

(b) If we test an engine to confirm that it meets the steady-state emission standards in §1039.101(b), we will use the duty cycle from paragraph (a) of this section that applies for that engine family.
(c) During idle mode, operate the engine with the following parameters:
(1) Hold the speed within your specifications.

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

(3) Keep engine torque under 5 percent of the peak torque value at maximum test speed.

(d) For full-load operating modes, operate the engine at wide-open throttle.

(e) See 40 CFR part 1065 for detailed specifications of tolerances and calculations.

(f) In the normal test sequence described in 40 CFR part 1065, subpart F, steady-state testing generally follows the transient test. For those cases where we do not require transient testing, perform the steady-state test after an appropriate warm-up period, consistent with good engineering judgment.

**§1039.510 What transient duty cycles apply for laboratory testing?**

(a) Measure emissions by testing the engine on a dynamometer with one of the following transient duty cycles to show that the engine meets the transient emission standards in §1039.101(a):

(1) If you certify an engine family for constant-speed operation only, use the transient duty-cycle described in Appendix I of this part.

(2) For all other engines, use the transient duty-cycle described in Appendix II of this part.

(b) If we test an engine to confirm that it meets the transient emission standards in §1039.101(a), we will use the transient duty cycle that applies for that engine family.

(c) The transient test sequence consists of an initial run through the transient sequence from a cold start, 20 minutes with no engine operation, then a final run through the same transient sequence. Start sampling emissions immediately after you start the engine. Combine the results from these two test runs by applying a weighting factor of 10 percent to the cold-start measurement and 90 percent to the hot-start measurement.

(d) If the engine was already operating before a test, use good engineering judgment to let the engine cool down enough so measured emissions during the next test will accurately represent those from an engine starting at room temperature.

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

Use the test procedures described in 40 CFR 86.1370-2007 to show that the engine meets the not-to-exceed emission standards in §1039.101(c).

**§1039.520 How do I perform exhaust durability testing?**

Determine deterioration factors to show that your engines will meet emission standards throughout the useful life, as described in §§1039.101 and 1039.240. This section describes how to determine deterioration factors, either with an engineering analysis, with pre-existing test data, or with new emission measurements. If you are required to perform durability testing, see §1039.220 for limitations on the maintenance that you may perform on your test engine.

(a) You may ask us to approve deterioration factors for an engine family with established technology based on engineering analysis instead of testing. Established technology refers to engines for which the applicable NMHC+NOx standard or FEL is higher than the Tier 3 NMHC+NOx standard described in §89.112, unless the engines use exhaust gas recirculation or aftertreatment. Established technology also refers to engines for which the applicable NMHC+NOx standard or FEL is at or below the Tier 3 NMHC+NOx standard if you can show that the engines do not have technologies other than those generally used on engines meeting NMHC+NOx standards less stringent than the Tier 3 standards.

(b) You may ask us to approve deterioration factors for an engine family based on emission measurements from similar highway or nonroad engines if you have already given us this data for certifying the other engines in the same

or previous model years. Use good engineering judgment to decide whether the two engines are similar.

(c) If you are unable to determine deterioration factors for an engine family under paragraph (a) or (b) of this section, select engines, subsystems, or components for testing. Determine deterioration factors based on service accumulation and related testing to represent the deterioration expected from in-use engines. You must measure emissions from the test engine at least three times with evenly spaced intervals of service accumulation. You may use extrapolation to determine deterioration factors once you have established a trend of increasing emissions with age for each pollutant. You may use an engine installed in nonroad equipment to accumulate service hours instead of running the engine only in the laboratory. Use good engineering judgment for all aspects of the effort to establish deterioration factors under this paragraph (c).

(d) Include the following information in your application for certification (see §1039.205(n)):

(1) If you use test data from a different engine family, explain why this is appropriate and include all the emission measurements on which you base the deterioration factor.

(2) If you determine your deterioration factors based on engineering analysis, explain why this is appropriate and include a statement that all data, analyses, evaluations, and other information you used are available for our review upon request.

(3) If you conduct testing to determine deterioration factors, describe the form and extent of service accumulation, including a rationale for selecting the service-accumulation period and the method you use to accumulate hours.

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

This section describes how to adjust emission results from engines using aftertreatment technology with infrequent regeneration events. For this section, "regeneration" means an intended event during which emission levels change while the system restores aftertreatment performance. For example, exhaust gas temperatures may increase temporarily to remove sulfur from adsorbers or to oxidize accumulated particulate matter in a trap. For this section, "infrequent" refers to regeneration events that are expected to occur less than once over the applicable transient duty cycle.

(a) Developing adjustment factors. Develop an upward adjustment factor and a downward adjustment factor for each pollutant based on measured emission data and observed regeneration frequency. Adjustment factors should generally apply to an entire engine family, but you may develop separate adjustment factors for different engine configurations within an engine family. You may use carryover or carry-across data to establish adjustment factors for an engine family, as described in §1039.240??, consistent with good engineering judgment. All adjustment factors for regeneration are additive. You may use either of the following different approaches for engines that use aftertreatment with infrequent regeneration events:

(1) You may disregard this section if regeneration does not significantly effect emission levels for an engine family (or configuration) or if it is not practical to identify when regeneration occurs. If you do not use adjustment factors under this section, your engines must meet emission standards for all testing, without regard to regeneration.

(2) If your engines use aftertreatment technology with extremely infrequent regeneration and you are unable to apply the provisions of this section, you may ask us to approve an alternate methodology to account for regeneration events.

(b) Calculating average adjustment factors. Calculate the average adjustment factor ($EF_A$) based on the following equation:

$_{EIA} = (F)(EF_H) + (1-F)(EF_L)$

Where,

F = the frequency of the regeneration event in terms of the fraction of tests during which the regeneration occurs.

$EF_H$ = measured emissions from a test in which the regeneration occurs.

$EF_{L\ =}$ measured emissions from a test in which the regeneration does not occur.

(c) Applying adjustment factors. Apply adjustment factors based on whether regeneration occurs during the test run. You must be able to identify regeneration in a way that is readily apparent during all testing.

(1) If regeneration does not occur during a test run, add an upward adjustment factor to the measured emission rate. Determine the upward adjustment factor (UAF) using the following equation:

$UAF = _{EIA} - EF_L$

(2) If regeneration occurs during a test run, subtract a downward adjustment factor from the measured emission rate. Determine the downward adjustment factor (DAF) using the following equation:

$DAF = EF_H - _{EIA}$

(d) Sample calculation. If $EF_L$ is 0.10 g/kW-hr, $EF_H$ is 0.50 g/kW-hr, and F is 0.1 (the regeneration occurs once for each ten tests), then:

$_{EIA} = (0.1)(0.5\ g/kW\text{-}hr) + (1.0 - 0.1)(0.1\ g/kW\text{-}hr) = 0.14\ g/kW\text{-}hr$

UAF = 0.14 g/kW-hr - 0.10 g/kW-hr = 0.04 g/kW-hr

DAF = 0.50 g/kW-hr - 0.14 g/kW-hr = 0.36 g/kW-hr

**Subpart G—Compliance Provisions**

**§1039.601 What compliance provisions apply to these engines?**

Engine and equipment manufacturers, as well as owners, operators, and rebuilders of these engines, and all other persons, must observe the requirements and prohibitions in 40 CFR part 1068 and the requirements of the Act. The compliance provisions in this subpart apply only to the engines we regulate in this part.

**§1039.605 What are the provisions for exempting engines from the requirements of this part if they are already certified under the motor-vehicle program?**

(a) This section applies to you if you are an engine manufacturer. See §1039.610 if you are not an engine manufacturer.

(b) The only requirements or prohibitions from this part that apply to an engine that is exempt under this section are in this section.

(c) If you meet all the following criteria and requirements regarding your new nonroad engine, it is exempt under this section:

(1) You must produce it by modifying an engine covered by a valid certificate of conformity under 40 CFR part 86.

(2) Do not make any changes to the certified engine that we could reasonably expect to increase its exhaust emissions. For example, if you make any of the following changes to one of these engines, you do not qualify for this exemption:

(i) Identify your full corporate name, address, and telephone number.

(ii) List the engine models you expect to produce under this exemption in the coming year.

(iii) State: "We produce each listed engine model for nonroad application without making any changes that could increase its certified emission levels, as described in 40 CFR 1039.605.".

(d) If your engines do not meet the criteria listed in paragraph (c) of this section, they will be subject to the standards and prohibitions of this part. Producing these engines without a valid exemption or certificate of conformity would violate the prohibitions in 40 CFR 1068.101.

(e) If you are the original engine manufacturer of both the highway and nonroad versions of an exempted engine, you must send us emission test data on the applicable nonroad duty cycle(s). You may include the data in your application for certification or in your letter requesting the exemption. If the highway engine is certified using chassis-based test procedures, you may ask us to waive the requirements of this paragraph (e).

(f) If you are the original engine manufacturer of an exempted engine that is modified by another company under this exemption, we may require you to send us emission test data on the applicable nonroad duty cycle(s). If we ask for this data, we will allow a reasonable amount of time to collect it.

(g) The engine exempted under this section must meet all applicable requirements from 40 CFR part 86. This applies to engine manufacturers, equipment manufacturers who use these engines, and all other persons as if these engines were used in a motor vehicle.

**§1039.610 What are the provisions for producing nonroad equipment with engines already certified under the motor-vehicle program?**

If you are not an engine manufacturer, you may produce nonroad equipment from complete or incomplete motor vehicles with the motor vehicle engine if you meet four criteria:

(a) The engine or vehicle is certified to 40 CFR part 86.

(b) The engine is not adjusted outside the engine manufacturer's specifications (see §1039.605(c)(2)).

(c) The engine or vehicle is not modified in any way that may affect its emission control.

(d) The engine or vehicle has the label we require in §1039.605(c)(5).

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

If you are unable to meet this part's requirements with engines using noncommercial fuels (such as unrefined natural gas released by oil wells), the following provisions apply for those engines:

(a) Create a separate engine family.

(b) Disregard the limits on adjustable parameters in §1039.115(e), but make sure the engines meet emission standards with normal settings when the engine is using fuel meeting the specifications of 40 CFR part 1065, subpart C.

(c) Add the following information to the emission control information label specified in §1039.135:

(1) Include instructions describing how to adjust the engine to operate in a way that maintains the effectiveness of the emission-control system.

(2) State: "THIS ENGINE IS CERTIFIED TO OPERATE IN APPLICATIONS USING NONCOMMERCIAL FUEL. USING IT IN AN APPLICATION INVOLVING ONLY COMMERCIAL FUELS MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.".

(d) Keep records to document the destinations and quantities of engines produced under this section.

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

(a) Your engine is exempt without a request if you produce it for a vehicle or piece of equipment that will be used solely for competition. To produce engines under this section, you must have a written request for an exempted engine from the equipment manufacturer, showing the basis for believing that the equipment will be used solely for competition. We would generally consider a vehicle or piece of equipment to be one that will be used solely for competition if it has features that are not easily removed that would make its use other than in competition unsafe, impractical, or highly unlikely.

(b) We may discontinue your exemption if we find that engines exempted under this section are not used solely for competition.

(d) You must permanently label engines exempted under this section to clearly indicate that they are to be used solely for competition. Failure to properly label an engine will void its exemption.

**§1039.625 What are the provisions for exempting engines for equipment-manufacturer flexibility?**

If you manufacture nonroad equipment, the provisions of this section may allow you to sell equipment with exempted engines after the Tier 4 emission standards begin to apply. As noted in paragraph (d) of this section, the exempted engines must meet less stringent emission standards. See 40 CFR 89.102(d) and (e) for provisions that apply to equipment made while Tier 1, Tier 2, or Tier 3 standards apply. See §1039.626 for special provisions that apply to you if you import equipment under this section.

(a) General. We may allow you to introduce into commerce in the United States limited numbers of nonroad equipment with exempted engines under this section. These provisions are available up to seven years after Tier 4 emission standards begin for each engine-power category, as shown in §1039.101. Consider all U.S.-directed equipment sales, including those from any parent or subsidiary companies, in showing that you meet the requirements of this section. You may use the exemptions in this section only if you have the primary responsibility for designing and manufacturing the equipment.

(b) Allowances. The following provisions, which apply separately to each engine-power category used to define emission standards in §1039.101, describe how many exempted engines you may sell under this section:

(1) Percent-of-production allowances. You may sell a certain number of units with exempted engines based on a percentage of your total sales within an engine-power category. Calculate annually the percentage of equipment with exempted engines from your total sales within an engine-power category. The seven-year sum of these percentages within an engine-power category may not exceed 80 percent, except as allowed under paragraph (b)(2) of this section.

(2) Small-volume allowances. You may sell up to 700 units with exempted engines within an engine-power category during the seven-year period, with no more than 200 units in any single calendar year. This paragraph (b)(2) applies only to engines from a single engine family within each calendar year.

(c) Inclusion of previous-tier engines. The following provisions apply to engines not yet subject to Tier 4 standards:

(1) If you use the provisions of §1068.105(a) to use up your inventories of engines not certified to new emission standards, do not include these units in your count of exempted engines under paragraph (b) of this section.

(2) If you install engines that are exempted from the Tier 4 standards for any reason other than for equipment-manufacturer flexibility under this section, do not include these units in your count of exempted engines under paragraph (b) of this section.

(3) If the engine's model year or manufacturing date for its engine-power category precedes the Tier 4 standards, you may nevertheless start using the allowances under this section before the Tier 4 standards apply; however, you may not start using these early allowances before the seven-year period for using allowances under the Tier 2 or Tier 3 program expires (see 40 CFR 89.102(d)). To use these early allowances, you must use engines that meet the emission standards described in paragraph (d) of this section. You must also count these units or calculate these percentages as described in paragraph (b) of this section and apply them to the total number or percentage of engines we allow for the Tier 4 standards. The maximum number of cumulative early allowances is 10 percent under the percent-of-production allowance or 100 units under the small-volume allowance.

(d) Standards. If you produce equipment with exempted engines under this section, the engines must meet less stringent emission standards.

(1) If you are using the provisions of paragraph (c)(3) of this section, engines must meet the appropriate Tier 1 (or more stringent) emission standards described in §89.112.

(2) In all other cases, engines with rated power from 37 kW up to 560 kW must meet the appropriate Tier 3 standards described in §89.112. Larger and smaller engines must meet the appropriate Tier 2 standards described in §89.112.

(e) Equipment labeling. You must add a permanent, legible label, written in block letters in English to the engine or another readily visible part of each piece of equipment you produce with exempted engines under this section. This label, which supplements the engine manufacturer's emission control information label, must include at least the

following items:

(1) The label heading "EMISSION CONTROL INFORMATION".

(2) Your corporate name and trademark.

(3) The calendar year in which the equipment is manufactured.

(4) Whom to contact for further information.

(5) The following statement:

THIS EQUIPMENT [or identify the type of equipment] HAS AN ENGINE THAT HAS BEEN EXEMPTED FROM CURRENT FEDERAL NONROAD EMISSION STANDARDS, AS ALLOWED BY 40 CFR 1039.625.

(f) Notification and reporting. You must notify us of your intent to use the provisions of this section and to verify that you are not exceeding the allowances.

(1) Before January 1 of the first year you intend to use the flexibility provisions of this section, send the Designated Compliance Officer and the Designated Enforcement Officer a written notice of your intent, including:

(i) Your company's name and address.

(ii) Whom to contact for more information.

(iii) The calendar years you expect to use the flexibility provisions of this section.

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

(v) Your best estimate of the number of engines in each engine-power category you will sell under this section in the upcoming calendar year and whether you intend to comply under paragraph (b)(1) or (b)(2) of this section.

(vi) The number of engines in each engine-power category you have sold under this section in previous calendar years.

(2) For each year that you use the flexibility provisions of this section, send the Designated Compliance Officer and the Designated Enforcement Officer a written report by March 31 of the following year. Include in your report the total number of engines you sold in the preceding year for each engine-power category, based on actual production information. If you might base your compliance on the percent-of-production allowances in paragraph (b)(1) of this section, identify the percentages that correspond to the number of engines in each engine-power category. Also identify the cumulative numbers and percentages of engines, if appropriate, for all the engines you have sold under this section for each engine-power category.

(g) Recordkeeping. Keep the following records of all equipment with exempted engines you sell under this section for at least five full years after the final year in which allowances are available for each engine-power category:

(1) The model number, serial number, and date of manufacture for each engine and piece of equipment.

(2) The rated power of each engine.

(3) The total number or percentage of exempted engines, as described in paragraph (b) of this section.

(4) The notifications and reports we require under paragraph (f) of this section.

(h) Engine exemption. As an engine manufacturer, you may produce exempted engines as needed under this section. You do not have to request this exemption for your engines, but you must have written assurance from equipment manufacturers that they need a certain number of exempted engines under this section. Send us an annual report of the engines you produce under this section, as described in §1039.250(a). The exempted engines must meet less

stringent standards, as described in paragraph (d) of this section. It must also have the label we require in §1039.135, with the following additional statement:

"THIS ENGINE HAS BEEN EXEMPTED FROM CURRENT FEDERAL NONROAD EMISSION STANDARDS. SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN FOR THE EQUIPMENT FLEXIBILITY PROVISIONS OF 40 CFR 1039.625 MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(i) Enforcement. Selling more exempted engines than we allow under this section or selling engines that do not meet the certification requirements of paragraph (d) of this section is a violation of §1068.101(a)(1). You must give us the records we require under this section if we ask for them (see §1068.101(a)(2)).

(j) Other exemptions. See 40 CFR 1068.255 for exemptions based on hardship for equipment manufacturers and secondary engine manufacturers.

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

This section describes special provisions that apply to anyone importing exempted engines into the United States under the provisions of §1039.625. For this section, we refer to an "equipment manufacturer" as the company with primary responsibility for designing and manufacturing a piece of equipment and an "importer" as any company importing equipment into the United States for which it does not have primary responsibility for design and manufacturing.

(a) As an equipment manufacturer, you may use the allowances specified in §1039.625 only if you meet the following additional requirements:

(1) Allow us full and immediate access to inspect your facilities and audit your records.

(2) Name someone who can represent you in Washington, DC.

(3) Agree that the Clean Air Act governs your activities under this subpart.

(4) Submit to the substantive and procedural laws of the United States.

(b) As an importer, you may sell engines under the provisions of §1039.625 only if the equipment manufacturer has met the requirements of paragraph (b) of this section for those engines. In addition, you must annually notify us of your intent to import exempted engines under this section and to verify that allowances are available to cover your actual sales.

(1) Before January 1 of the first year you intend to use the flexibility provisions of this section, send the Designated Compliance Officer and the Designated Enforcement Officer a written notice of your intent, including:

(i) Your company's name and address (and the name and address of any parent companies).

(ii) Whom to contact for more information.

(iii) The calendar years you expect to use the flexibility provisions of this section.

(iv) The name and address of the company that produces the equipment you intend to import under this section.

(v) Your best estimate of the number of engines in each engine-power category you will sell under this section in the upcoming calendar year.

(vi) The number of exempted engines in each engine-power category you have sold in previous calendar years from each equipment manufacturer.

(2) For each year that you use the flexibility provisions of this section, send the Designated Compliance Officer

and the Designated Enforcement Officer a written report by March 31 of the following year. Include in your report the total number of engines you sold in the preceding year for each engine-power category from each equipment manufacturer.

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

If you are a nonroad equipment manufacturer, you may use the hardship provisions specified in §1068.255 to sell equipment with exempted engines for up to two years, subject to two additional conditions:

(a) You must show that you were selling new equipment with engines that were certified to meet the requirements of 40 CFR part 89 before 2003.

(b) You must show that you have used up the allowances to produce equipment with exempted engines under §1039.625.

**§1039.635 What are the hardship provisions for engine manufacturers?**

If you qualify for the hardship provisions specified in §§1068.245 or 1068.250 of this chapter, we may approve a period of delayed compliance for up to two years total.

**§1039.639 What special provisions apply to engines sold in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands?**

Engines introduced into commerce in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands may meet the latest emission standards in 40 CFR 89.112 instead of the Tier 4 standards in §1039.101. Introducing any such engine into commerce in any state or territory of the United States other than Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands, throughout its lifetime, is a violation of 40 CFR 1068.101(a)(1). To use this exemption, you must include the following statement on the label we require in 40 CFR 89.110 (or on a separate, permanent label with your corporate name and trademark): "THIS ENGINE DOES NOT CONFORM TO U.S. EPA EMISSION REQUIREMENTS IN EFFECT AT THE TIME OF PRODUCTION AND MAY NOT BE IMPORTED INTO THE UNITED STATES OR ANY TERRITORY OF THE UNITED STATES EXCEPT GUAM, AMERICAN SAMOA, OR THE COMMONWEALTH OF NORTHERN MARIANA ISLANDS.".

**Subpart H—Averaging, Banking, and Trading for Certification**

**§1039.701 General provisions.**

(a) You may average, bank, and trade (ABT) emission credits for purposes of certification as described in this subpart to show compliance with the standards of this part. To do this, you must show that you have sufficient credits to offset any credit deficits for the applicable model year. If you cannot show in your end-of-year report that you have sufficient credits to offset a credit deficit for any engine family, we may void the certificate of conformity for the engine family.

(b) The averaging set restrictions that apply are specified in §1039.735.

(c) The definitions of Subpart I of this part apply to this subpart. The following definitions also apply:

(1) Standard means the standard that applies under subpart B of this part. (Note: In other subparts of this part the term "applicable standard" means the standard or FEL.)

(2) Broker means any entity that facilitates a trade between a buyer and seller.

(3) Buyer means the entity that receives credits as a result of trade.

(4) Family emission limit (FEL) has the meaning given it in §1039.801.

(5) Reserved credits means credits you have generated that we have not yet verified in reviewing the end-of-year report.

(6) Seller means the entity that provides credits during a trade.

(d) Include only your U.S.-directed production certified under this part in this ABT program. Do not include any exported, exempted, or excluded engines in this program.

**§1039.705 How do I calculate emission credits?**

The following provisions apply for calculating NOx credits, NMHC+NOx credits, or PM credits:

(a) Calculate positive credits for an engine family that has an FEL below the applicable standard. Calculate negative credits for an engine family that has an FEL above the applicable standard.

(b) Calculate for each participating engine family NOx + NMHC emission credits and/or PM emission credits (positive or negative) according to the following equation and round them to the nearest one-hundredth of a megagram (Mg), using consistent units throughout the equation:

Emission credits = (Std - FEL) x (Volume) x (AvgPR) x (UL) x ($10^{-6}$)

Where:

Std = the applicable nonroad engine emission standard, in grams per kilowatt-hour.

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

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

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

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

(c) Do not include engines sold to equipment or vehicle manufacturers under the provisions of §1039.625. Use quarterly projections of production volumes for initial certification. Base your actual compliance determination on

the end-of-year production volumes.

**§1039.710 How do I generate and use emission credits?**

(a) If you certify an engine family to an FEL below the applicable standard, you may generate positive credits based on the difference between the FEL and the standard, as described in §1039.705.

(b)(1) You may certify an engine family to an FEL above the applicable standard if you have sufficient credits (or project to have sufficient credits at the end of the year) to offset the negative credits. Your FEL may not be higher than the applicable FEL cap specified in subpart A of this part. Calculate the negative credits based on the difference between the FEL and the standard, as described in §1039.705.

(2) You may offset the negative credits by using positive credits that you generate from other families during the same model year (i.e., averaging) or by using banked credits from earlier model years.

(c) Since participation in the emission credit program is voluntary, you need to notify us during certification of your intent to participate in the ABT program, as described in §1039.205.

**§1039.715 How do I bank emission credits?**

(a) You may bank unused emission credits, but only after we have reviewed your end-of-year reports.

(b) During the calendar year and before you send in your end-of-year report, you may reserve any credits you originally designate for banking during certification. You may redesignate these credits for trading in your end-of-year report, but they may not be used to demonstrate compliance until we have verified them.

(c) You may use for averaging or trade any credits you declared for banking from the previous calendar year that we have not reviewed. But, we may revoke these credits later—following our review of your end-of-year report or audit actions. For example, this could occur if we find that credits are based on erroneous calculations; or that emission levels are misrepresented, unsubstantiated, or derived incorrectly in the certification process.

**§1039.720 How do I trade emission credits?**

(a) You may trade banked emission credits.

(b) You may trade banked credits to any certifying manufacturer.

(c) If a negative credit balance results from a credit trade, both buyers and sellers are liable, except in cases involving fraud. We may void the certificates of all emission families participating in a negative trade.

(1) If you buy credits but have not caused the negative credit balance, you must only supply more credits equivalent to the amount of invalid credits you used.

(2) If you caused the credit shortfall, you may be subject to the requirements of §1039.730(b)(6).

**§1039.725 What information must I keep?**

(a) Maintain and keep six types of properly organized and indexed records for each engine family in the ABT program:

(1) Model year and EPA engine family.

(2) FEL.

(3) Useful life.

(4) Power rating for each configuration tested

(5) Projected U.S.-directed production volume for the model year.

(6) Actual U.S.-directed production volume for the model year.

(b) We may ask you to provide that information required by paragraph (a) of this section on a quarterly basis. We may also ask you to maintain records of credits deficits and surpluses on a quarterly basis.

(c) Maintain and keep six types of properly organized and indexed records for each engine in the ABT program:

(1) Model year and EPA engine family.

(2) FEL.

(3) Useful life.

(4) Power rating for each configuration tested

(5) Build date and assembly plant.

(6) Purchaser and destination.

(d) Keep paper records of this information for eight years from the due date for the end-of-year report. You may use any additional storage formats or media if you like.

(e) Keep a copy of all of the information you send us under §1039.730.

(f) We may ask you to keep or send other information necessary to implement this subpart.

**§1039.730 What information must I report?**

(a) Include the following information in each of your applications for certification:

(1) A statement that, to the best of your belief, you will not have a negative credit balance for any engine family when all credits are calculated.

(2) Detailed calculations of projected emission credits (zero, positive, or negative) based on U.S.-directed production projections. If you project a credit deficit, state the source of credits needed to offset the credit deficit.

(b) At the end of each model year, send an end-of-year report. You must submit a final end-of-year report within 270 days of the end of the model year. Unless we tell you otherwise, you must also submit a preliminary within 90 days of the end of the model year. Failure to submit reports on time is a violation of the Act.

(1) Your report must include three things:

(i) Calculate in detail emission credits (positive or negative) based on actual U.S.-directed production volumes.

(ii) Demonstrate that you have the positive credits needed to offset any negative credits. If you cannot demonstrate that you have enough credits for an engine family at the time you submit your end-of-year report, we may void the certificate of conformity for that family.

(iii) State whether you will reserve any credits for banking.

(2) Base your U.S.-directed production volumes on the point of first retail sale. You may consider distributors to be the point of first retail sale if all their engines are sold to ultimate buyers in the United States.

(3) Send end-of-year reports to the Designated Compliance Officer.

(4) If you generate credits for banking and you do not send your end-of-year reports within 90 days after the end of the model year, you may not use or trade the credits until we receive and review your reports. You may not use projected credits pending our review.

(5) You may correct errors discovered in your end-of-year report, including errors in calculating credits according to the following table:

| If... | And if... | Then we... |
|---|---|---|
| (i) Our review discovers an error in your end-of-year report that increases your credit balance | the discovery occurs within 270 days of the end of the model year | restore the credits for your use. |
| (ii) You discover an error in your report that increases your credit balance | the discovery occurs within 270 days of the end of the model year | restore the credits for your use. |
| (iii) We or you discover an error in your report that increases your credit balance | the discovery occurs more than 270 days after the end of the model year | do not restore the credits for your use. |
| (iv) We discover an error in your report that reduces your credit balance | at any time after receipt | reduce your credit balance |

(6) If our review of your end-of year-report shows a negative balance, you may buy credits to bring your credit balance to zero. But you must buy 1.1 credits for each 1.0 credit needed. We may void the certificates for any engine family certified to an FEL above the standard if you are not able to show us within 90 days of when we notify you that you have sufficient credits.

(c) Within 90 days of any credit trade, you must send the Designated Compliance Officer a report of the trade that includes three types of information:

(1) The corporate names of the buyer, seller, and any brokers.

(2) Copies of contracts related to credit trading from the buyer, seller, and broker, as applicable.

(d) Include in each report a statement certifying the accuracy and authenticity of its contents.

(e) We may void a certificate of conformity for any engine family if you do not keep the records this section requires or give us 1information when we ask for it.

**§1039.735 What restrictions apply for using credits?**

The following restrictions apply for credit use:

(a) Averaging sets. Credits may be exchanged only within a single averaging set. Averaging sets are defined based on the standards against which positive credits are generated. There are two separate averaging sets for Tier 4 engines. Tier 4 engines rated under 19 kW that are subject to this part constitute one averaging set; Tier 4 engines rated at or above 19 kW that are subject to this part constitute the second averaging set. Averaging set restrictions for earlier tiers are defined in 40 CFR part 89 subpart C.

(b) Credits from a different tier of standards. Credits are defined by the tier of standards relative to which they were generated (i.e., the standards to which an engine was certified). For example, credits generated by engines certified to the Tier 4 standards are considered to be "Tier 4 credits". You may not use credits generated from engines certified to a different tier of standards, except as specified in the following table:

| If the power rating of the credit generating engine is. . . | Then you may use . . . |
|---|---|
| (1) Less than 37 kW | Tier 2 credits to show compliance with Tier 4 standards. |
| (2) At least 37 kW, but less than 750 kW | Tier 3 credits to show compliance with Tier 4 standards. |
| (3) 750 kW or higher | Tier 2 credits to show compliance with Tier 4 standards. |

(c) NOx and NMHC+NOx credits. You may use NOx credits to show compliance with NMHC+NOx standards. You may use NMHC+NOx credits to show compliance with NOx standards, but you must adjust the NMHC+NOx credits downward by twenty percent when you use them, as shown in the following equation:

NOx credits = (0.8) × (NMHC+NOx credits)

(d) Transitional restrictions. During the phase-in period, the number of your engines certified to NOx FELs over 0.80 g/kW-hr using banked NMHC+NOx or NOx credits may not exceed ten percent of your total U.S.-directed production in any power category.

**Subpart I—Definitions and Other Reference Information**

**§1039.801 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 the Act gives to them. The definitions follow:

Act means the Clean Air Act, as amended, 42 U.S.C. 7401 et seq.

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. You may ask us to exclude a parameter that is difficult to access if it cannot be adjusted to affect emissions without significantly degrading performance, or if you otherwise show us that it will not be adjusted in a way that affects emissions during in-use operation.

Aftertreatment means relating to any system, component, or technology mounted downstream of the exhaust valve or exhaust port whose design function is to reduce exhaust emissions.

Aircraft means any vehicle capable of sustained air travel above treetop heights.

Auxiliary emission-control device means any element of design that senses temperature, engine rpm, motive speed, transmission gear, atmospheric pressure, manifold pressure or vacuum, or any other parameter to activate, modulate, delay, or deactivate the operation of any part of the emission-control system. This also includes any other feature that causes in-use emissions to be higher than those measured under test conditions, except as we allow under this part.

Blue Sky Series engine means an engine meeting the requirements of §1039.140.

Brake power means the usable power output of the engine, not including power required to operate fuel pumps, oil pumps, or coolant pumps.

Broker means any entity that facilitates a trade of emission credits between a buyer and seller.

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.

Certification means obtaining a certificate of conformity for an engine family that complies with the emission standards and requirements in this part.

Compression-ignition means relating to a type of reciprocating, internal-combustion engine that is not a spark-ignition engine.

Constant-speed engine means an engine governed to operate at a single speed.

Constant-torque engine means an engine governed to operate at constant load with varying speeds or one that is installed or will be installed in an application that limits engine operation to a constant load.

Crankcase emissions means airborne substances emitted to the atmosphere from any part of the engine crankcase's ventilation or lubrication systems. The crankcase is the housing for the crankshaft and other related internal parts.

Designated Compliance Officer means the Manager, Engine Programs Group (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

Designated Enforcement Officer means the Director, Air Enforcement Division (2242A), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW.,Washington, DC 20460.

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

Emission-data engine means an engine that is tested for certification.

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

Engine family means a group of engines with similar emission characteristics, as specified in §1039.230.

Engine manufacturer means the manufacturer of the engine. See the definition of "manufacturer" in this section.

Engine used in a locomotive means either an engine placed in the locomotive to move other equipment, freight, or passenger traffic; or an engine mounted on the locomotive to provide auxiliary power.

Exempted means relating to an engine that is not required to meet otherwise applicable standards because the engine conforms to regulatory conditions specified for an exemption in this part 1039 or in part 1068 of this chapter. (Note: Engines exempted with respect to a certain tier of standards may be required to comply with an earlier tier of standards as a condition of the exemption; for example, engines exempted with respect to Tier 4 standards may be required to comply with Tier 3 standards.)

Excluded means relating to an engine that either:

(1) Has been determined not to be a nonroad engine, as specified in 40 CFR 1068.30; or

(2) Is a nonroad engine that, according to §1039.5, is not subject to this part 1039.

Exhaust gas recirculation means an emission-control 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 prior to 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 prior to or during combustion is not considered to be exhaust gas recirculation for the purposes of this part.

Family emission limit (FEL) means an emission level declared by the manufacturer to serve in place of an emission standard for certification under the emission-credit program in subpart H of this part. The family emission limit must be expressed to the same number of decimal places as the emission standard it replaces.

FEL cap means the highest FEL allowed by the regulations for given a power category and tier of standards.

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.

Good engineering judgment has the meaning we give in 40 CFR 1068.5.

Hydrocarbon (HC) means the hydrocarbon group on which the emission standards are based for each fuel type. For petroleum-fueled engines and natural gas-fueled engines, HC means nonmethane hydrocarbon (NMHC). For alcohol-fueled engines, HC means total hydrocarbon equivalent (THCE).

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

Intermediate test speed has the meaning we give in 40 CFR 1065.515.

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

Manufacturer has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures an engine, vehicle, or piece of equipment for sale in the United States or otherwise introduces a new nonroad engine into commerce in the United States. This includes importers who import engines, equipment, or vehicles for resale. (Note: In §1039.626, the term "equipment manufacturer" has a more narrow meaning; that narrow meaning only applies to that section.)

Marine engine means an engine that someone installs or intends to install on a marine vessel. There are two kinds of marine engines:

(1) Propulsion marine engine means a marine engine that moves a vessel through the water or directs the vessel's movement.

(2) Auxiliary marine engine means a marine engine not used for propulsion.

Marine vessel means a vehicle that is capable of operation in water but is not capable of operation out of water. Amphibious vehicles are not marine vessels.

Maximum brake power means the maximum brake power an engine produces at maximum test speed.

Maximum test speed has the meaning we give in 40 CFR 1065.515.

Maximum test torque has the meaning we give in 40 CFR 1065.1001.

Model year means one of the following things:

(1) For freshly manufactured engines (see definition of "new nonroad engine," paragraph (1)), model year means one of the following:

(i) Calendar year.

(ii) Your annual new model production period if it is different than the calendar year. This must include January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year.

(2) For an engine that is converted to a nonroad engine after being placed into service in a motor vehicle, model year means the calendar year in which the engine was originally produced (see definition of "new nonroad engine," paragraph (2)).

(3) For a nonroad engine excluded under §1039.5 that is later converted to operate in an application that is not excluded, model year means the calendar year in which the engine was originally produced (see definition of "new nonroad engine," paragraph (3)).

(4) For engines that are not freshly manufactured but are installed in new nonroad equipment, model year means the calendar year in which the engine is installed in the new nonroad equipment. This installation date is based on the time that final assembly of the equipment is complete (see definition of "new nonroad engine," paragraph (4)).

(5) For an engine modified by an importer (not the original engine manufacturer) who has a certificate of conformity for the imported engine (see definition of "new nonroad engine," paragraph (5)), model year means one of the following:

(i) The calendar year in which the importer finishes modifying and labeling the engine.

(ii) Your annual production period for producing engines if it is different than the calendar year; follow the guidelines in paragraph (1)(ii) of this definition.

(6) For an engine you import that does not meet the criteria in paragraphs (1) through (5) of the definition of "new nonroad engine," model year means the calendar year in which the engine manufacturer completed the original assembly of the engine. In general, this applies to used equipment that you import without conversion or major modification.

Motor vehicle has the meaning we give in 40 CFR 85.1703(a). In general, motor vehicle means a self-propelled vehicle that can transport one or more people or any material, but doesn't include any of the following:

(1) Vehicles having a maximum ground speed over level, paved surfaces no higher than 40 km per hour (25 miles per hour).

(2) Vehicles that lack features usually needed for safe, practical use on streets or highways— for example, safety

features required by law, a reverse gear (except for motorcycles), or a differential.
(3) Vehicles whose operation on streets or highways would be unsafe, impractical, or highly unlikely. Examples are vehicles with tracks instead of wheels, very large size, or features associated with military vehicles, such as armor or weaponry.

New nonroad engine means any of the following things:
(1) A freshly manufactured nonroad engine for which the ultimate buyer has never received the equitable or legal title. This kind of vehicle might commonly be thought of as "brand new." In the case of this paragraph (1), the engine is no longer new when the ultimate buyer receives this title or the product is placed into service, whichever comes first.
(2) An engine originally manufactured as a motor vehicle engine that is later intended to be used in a piece of nonroad equipment. In this case, the engine is no longer a motor vehicle engine and becomes a "new nonroad engine". The engine is no longer new when it is placed into nonroad service.
(3) A nonroad engine that has been previously placed into service in an application we exclude under §1039.5, where that engine is installed in a piece of equipment for which these exclusions do not apply. The engine is no longer new when it is placed into nonroad service. For example, this would apply to a stationary engine that is no longer used in a stationary application.
(4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in new nonroad equipment. The engine is no longer new when the ultimate buyer receives a title for the equipment or the product is placed into service, whichever comes first. This generally includes installation of used engines in new equipment.
(5) An imported nonroad engine covered by a certificate of conformity issued under this part, where someone other than the original engine manufacturer modifies the engine after its initial assembly and holds the certificate. The engine is no longer new when it is placed into nonroad service.
(6) An imported nonroad engine that is not covered by a certificate of conformity issued under this part at the time of importation. This addresses uncertified engines and vehicles that have been placed into service in other countries and that someone seeks to import into the United States. Importation of this kind of new nonroad engine (or vehicle containing such an engine) is generally prohibited by 40 CFR part 1068.

New nonroad equipment means either of the following things:
(1) A nonroad vehicle or other piece of equipment for which the ultimate buyer has never received the equitable or legal title. The product is no longer new when the ultimate buyer receives this title or the product is placed into service, whichever comes first.
(2) An imported nonroad piece of equipment with an engine not covered by a certificate of conformity issued under this part at the time of importation and manufactured after the date for applying the requirements of this part.

Noncommercial fuel means a fuel that is not marketed or sold as a commercial product. For example, this includes methane produced and released from landfills or oil wells.

Noncompliant engine means an engine that was originally covered by a certificate of conformity, but is not in the certified configuration or otherwise does not comply with the conditions of the certificate.

Nonconforming engine means an engine not covered by a certificate of conformity that would otherwise be subject to emission standards.

Nonmethane hydrocarbon means the difference between the emitted mass of total hydrocarbons and the emitted mass of methane.

Nonroad means relating to nonroad engines or equipment that includes nonroad engines.

Nonroad engine has the meaning given in 40 CFR 1068.30. In general this means all internal- combustion engines except motor vehicle engines, stationary engines, or engines used solely for competition. This part does not apply to all nonroad engines (see §1039.5).

Nonroad equipment means a vehicle or piece of equipment that is powered by one or more nonroad engines.

Nonroad equipment manufacturer means any person engaged in manufacturing or assembling new nonroad vehicles or equipment or importing such vehicles or equipment for resale. This includes any person who acts for and is under the control of any such person in connection with distributing such vehicles or equipment. A nonroad vehicle or equipment manufacturer does not include any dealer with respect to new nonroad vehicles or equipment received by such person in commerce. A nonroad equipment manufacturer does not include any person engaged in the manufacturing or assembling of new nonroad vehicles or equipment who does not install an engine as part of that manufacturing or assembling process. All nonroad vehicle or equipment manufacturing entities under the control of the same person are considered to be a single nonroad equipment manufacturer.

Opacity means the fraction of a beam of light, expressed in percent, which fails to penetrate a plume of smoke.

Oxides of nitrogen has the meaning given it in 40 CFR part 1065

Particulate trap means

Placed into service means used for its intended purpose.

Point of first retail sale means the location at which the retail sale occurs. This generally means a dealership.

Power category means a specific range rated engine power that defines the applicability of standards. For example, the 56-130 kW power category includes all engines with rated power of at least 56 kW but less than 130 kW. See §1039.101 for a list of specific power categories. (Note: In some cases, FEL caps are based on subcategories of power categories.)

Rated power means the measured maximum brake power output of an engine. The rated power of an engine family is the highest rated power of the engines within the family. Note: §1039.230 generally prohibits grouping engines from different power categories in the same engine family.

Rated speed means the maximum full load governed speed for governed engines ane the speed of maximum horsepower for ungoverned engines.

Revoke means to discontinue the certificate for an engine family. If we revoke a certificate, you must apply for a new certificate before continuing to produce the affected vehicles or engines. This does not apply to vehicles or engines you no longer possess.

Round means to round numbers according to ASTM E29-02 (incorporated by reference in §1039.810), unless otherwise specified.

Scheduled maintenance means adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems that is periodically needed to keep a part from failing or malfunctioning. 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.

Small-volume engine manufacturer means an engine manufacturer that had engine families certified to meet the requirements of 40 CFR part 89 before 2003 and had annual U.S.-directed production of no more than 2,500 units in 2002 and all earlier calendar years. For manufacturers owned by a parent company, the limit applies to the production of the parent company and all of its subsidiaries.

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.

Stationary engine means an internal combustion engine that is neither a nonroad engine, nor a motor-vehicle engine, nor an engine used solely for competition (see the definition of nonroad engine in 40 CFR 1068.30). In general this includes fixed engines and all portable or transportable engines that stay in a single site at a building, structure, facility, or installation for at least a full year; this does not include an engine installed in equipment that has the ability to propel itself. For year-round sources, a full year is 12 consecutive months. For seasonal sources, a full year is a full annual operating period of at least three months. A seasonal source is a site with engines operating only part of the year for at least two consecutive years. If you replace an engine with one that does the same or similar work in the same place, you may apply the previous engine's service to your calculation for residence time. If you move a stationary engine anytime in its life after it has been in place for at least a full year, it becomes a nonroad engine subject to emission standards unless it stays at the new location for a full year.

Suspend means to temporarily discontinue the certificate for an engine family. If we suspend a certificate, you may not sell vehicles or engines from that engine family unless we reinstate the certificate or approve a new one.

Test engine means an engine in a test sample.

Test sample means the collection of engines selected from the population of an engine family for emission testing.

Tier 1 means relating to the Tier 1 emission standards, as shown in 40 CFR 89.112.

Tier 2 means relating to the Tier 2 emission standards, as shown in 40 CFR 89.112.

Tier 3 means relating to the Tier 3 emission standards, as shown in 40 CFR 89.112.

Tier 4 means relating to the Tier 4 emission standards, as shown in §1039.101. This includes the emission standards for all pollutants if an engine is subject to Tier 4 emission standards for any pollutant. For example, this includes the Tier 3 HC+NOx standard during the phase-in period when engines are subject to the Tier 4 PM standard.

Total hydrocarbon means the combined mass organic compounds measured by our total hydrocarbon test procedure, expressed as a hydrocarbon with a hydrogen-to-carbon mass ratio of 1.85:1.

Total hydrocarbon equivalent means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, alcohols and aldehydes, or other organic compounds that are measured separately as contained in a gas sample, expressed as petroleum-fueled engine hydrocarbons. The hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

Ultimate buyer means ultimate purchaser.

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

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, and the U.S. Virgin Islands.

Upcoming model year means for an engine family the model year after the one currently in production.

U.S.-directed production volume means the number of engine units, subject to the requirements of this part, produced by a manufacturer for which the manufacturer has a reasonable assurance that sale was or will be made to ultimate buyers in the Unites States.

Useful life means the period during which the engine is designed to properly function in terms of reliability and fuel consumption, without being remanufactured, specified as a number of hours of operation or calendar years. It is

the period during which a new nonroad engine is required to comply with all applicable emission standards. See §1039.101(g).

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

Void means to invalidate a certificate or an exemption. If we void a certificate, all the vehicles produced under that engine family for that model year are considered noncompliant, and you are liable for each vehicle produced under the certificate and may face civil or criminal penalties or both. If we void an exemption, all the vehicles produced under that exemption are considered uncertified (or nonconforming), and you are liable for each vehicle produced under the exemption and may face civil or criminal penalties or both. You may not produce any additional vehicles using the voided exemption.

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 psi.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

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

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

| | |
|---|---|
| °C | degrees Celsius. |
| ASTM | American Society for Testing and Materials. |
| cc | cubic centimeters. |
| CFR | Code of Federal Regulations. |
| CI | compression-ignition. |
| cm | centimeter. |
| CO | carbon monoxide. |
| $CO_2$ | carbon dioxide. |
| EPA | Environmental Protection Agency. |
| FEL | Family Emission Limit. |
| g/kW-hr | grams per kilowatt-hour. |
| HC | hydrocarbon. |
| ISO | International Organization for Standardization. |
| kPa | kilopascals. |
| kW | kilowatts. |
| m | meters. |
| MIL | malfunction-indicator light. |
| mm Hg | millimeters of mercury. |
| NMHC | nonmethane hydrocarbons. |
| NOx | oxides of nitrogen (NO and $NO_2$). |
| psi | pounds per square inch of absolute pressure. |
| psig | pounds per square inch of gauge pressure. |
| rpm | revolutions per minute. |
| SAE | Society of Automotive Engineers. |
| SI | spark-ignition. |
| THC | total hydrocarbon. |
| THCE | total hydrocarbon equivalent. |
| U.S.C. | United States Code. |

**§1039.810 What materials does this part reference?**

We have incorporated by reference the documents listed in this section. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, Air and Radiation Docket and Information Center, 1301 Constitution Ave., NW., Room B102, EPA West Building, Washington, DC 20460 or the Office of the Federal Register, 800 N. Capitol St., NW., 7th Floor, Suite 700, Washington, DC.

(a) ASTM material. Table 1 of §1039.810 lists material from the American Society for Testing and Materials that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428. Table 1 follows:

Table 1 of §1039.810—ASTM Materials

| Document number and name | Part 1039 reference |
|---|---|
| ASTM E29-02, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications. | 1039.801 |

(b) SAE material. Table 2 of §1039.810 lists material from the Society of Automotive Engineering that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096. Table 2 follows:

Table 2 of §1039.810—SAE Materials

| Document number and name | Part 1039 reference |
|---|---|
| SAE J1930, Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms, May 1998. | 1039.135 |

**§1039.815 How should I request EPA to keep my information confidential?**

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method. We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2.

(b) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.

(c) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in 40 CFR 2.204.

**§1039.820 How do I request a hearing?**

See 40 CFR part 1068, subpart G, for information related to hearings.

Appendix I to Part 1039— Nonroad Compression-ignition (CI) Transient Cycle for Constant-Speed Engines

| Time (s) | Normalized Speed | Normalized Torque |
|---|---|---|
| 1 | 58% | 5% |
| 2 | 58% | 5% |
| 3 | 58% | 5% |
| 4 | 58% | 5% |
| 5 | 58% | 5% |
| 6 | 58% | 5% |
| 7 | 58% | 5% |
| 8 | 58% | 5% |
| 9 | 58% | 5% |
| 10 | 58% | 5% |
| 11 | 58% | 5% |
| 12 | 58% | 5% |
| 13 | 58% | 5% |
| 14 | 58% | 5% |
| 15 | 58% | 5% |
| 16 | 58% | 5% |
| 17 | 58% | 5% |
| 18 | 58% | 5% |
| 19 | 58% | 5% |
| 20 | 58% | 5% |
| 21 | 65% | 8% |
| 22 | 72% | 11% |
| 23 | 79% | 14% |
| 24 | 86% | 17% |
| 25 | 93% | 20% |
| 26 | 93% | 20% |
| 27 | 93% | 20% |
| 28 | 93% | 20% |
| 29 | 93% | 20% |
| 30 | 93% | 20% |
| 31 | 93% | 20% |
| 32 | 94% | 20% |
| 33 | 94% | 22% |
| 34 | 94% | 23% |
| 35 | 93% | 23% |
| 36 | 93% | 25% |
| 37 | 93% | 24% |
| 38 | 94% | 23% |
| 39 | 93% | 21% |
| 40 | 94% | 21% |
| 41 | 96% | 22% |
| 42 | 95% | 19% |
| 43 | 95% | 14% |
| 44 | 95% | 10% |
| 45 | 93% | 50% |
| 46 | 93% | 36% |
| 47 | 93% | 29% |
| 48 | 93% | 26% |
| 49 | 95% | 29% |
| 50 | 95% | 26% |
| 51 | 95% | 18% |
| 52 | 95% | 14% |
| 53 | 95% | 10% |
| 54 | 95% | 9% |
| 55 | 93% | 42% |
| 56 | 93% | 42% |
| 57 | 93% | 35% |
| 58 | 93% | 29% |
| 59 | 93% | 28% |
| 60 | 93% | 28% |
| 61 | 93% | 25% |
| 62 | 93% | 28% |
| 63 | 93% | 26% |
| 64 | 93% | 26% |
| 65 | 95% | 24% |
| 66 | 95% | 17% |
| 67 | 95% | 13% |
| 68 | 95% | 10% |
| 69 | 95% | 9% |
| 70 | 94% | 51% |
| 71 | 93% | 45% |
| 72 | 93% | 42% |
| 73 | 94% | 40% |
| 74 | 93% | 30% |
| 75 | 93% | 27% |
| 76 | 93% | 25% |
| 77 | 93% | 23% |
| 78 | 93% | 22% |
| 79 | 94% | 21% |
| 80 | 93% | 20% |
| 81 | 95% | 20% |
| 82 | 95% | 19% |
| 83 | 95% | 14% |
| 84 | 95% | 11% |
| 85 | 95% | 9% |
| 86 | 95% | 8% |
| 87 | 95% | 7% |
| 88 | 95% | 7% |
| 89 | 95% | 6% |
| 90 | 95% | 6% |
| 91 | 95% | 6% |
| 92 | 95% | 6% |
| 93 | 81% | 5% |
| 94 | 93% | 53% |
| 95 | 93% | 43% |
| 96 | 93% | 35% |
| 97 | 93% | 34% |
| 98 | 93% | 29% |
| 99 | 93% | 26% |
| 100 | 93% | 25% |
| 101 | 93% | 23% |
| 102 | 93% | 21% |
| 103 | 93% | 20% |
| 104 | 93% | 20% |
| 105 | 94% | 19% |
| 106 | 94% | 21% |
| 107 | 94% | 22% |
| 108 | 93% | 21% |
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| 113 | 94% | 20% |
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| 127 | 94% | 23% |
| 128 | 94% | 24% |
| 129 | 93% | 23% |
| 130 | 94% | 39% |
| 131 | 94% | 40% |
| 132 | 94% | 34% |
| 133 | 94% | 34% |
| 134 | 94% | 32% |
| 135 | 94% | 32% |
| 136 | 94% | 30% |
| 137 | 94% | 27% |
| 138 | 94% | 29% |
| 139 | 94% | 35% |
| 140 | 94% | 41% |
| 141 | 94% | 43% |
| 142 | 94% | 42% |
| 143 | 94% | 46% |
| 144 | 94% | 37% |
| 145 | 94% | 34% |
| 146 | 94% | 29% |
| 147 | 94% | 27% |
| 148 | 94% | 27% |
| 149 | 94% | 28% |
| 150 | 94% | 29% |
| 151 | 93% | 30% |
| 152 | 93% | 27% |
| 153 | 94% | 29% |
| 154 | 95% | 27% |
| 155 | 95% | 19% |
| 156 | 95% | 14% |
| 157 | 95% | 11% |
| 158 | 95% | 9% |
| 159 | 95% | 8% |
| 160 | 95% | 7% |
| 161 | 95% | 7% |
| 162 | 95% | 6% |
| 163 | 95% | 6% |
| 164 | 95% | 6% |
| 165 | 93% | 5% |
| 166 | 59% | 5% |
| 167 | 58% | 6% |
| 168 | 58% | 6% |
| 169 | 58% | 6% |
| 170 | 58% | 6% |
| 171 | 58% | 6% |
| 172 | 58% | 6% |
| 173 | 58% | 6% |
| 174 | 58% | 6% |
| 175 | 58% | 6% |
| 176 | 58% | 6% |
| 177 | 58% | 6% |
| 178 | 58% | 50% |
| 179 | 94% | 49% |
| 180 | 93% | 41% |
| 181 | 94% | 36% |
| 182 | 93% | 35% |
| 183 | 94% | 28% |
| 184 | 93% | 24% |
| 185 | 93% | 21% |
| 186 | 93% | 24% |
| 187 | 93% | 25% |
| 188 | 93% | 28% |
| 189 | 94% | 29% |
| 190 | 93% | 40% |
| 191 | 94% | 33% |
| 192 | 93% | 29% |
| 193 | 93% | 29% |
| 194 | 93% | 23% |
| 195 | 93% | 24% |
| 196 | 93% | 21% |
| 197 | 93% | 32% |
| 198 | 93% | 29% |
| 199 | 94% | 32% |
| 200 | 93% | 32% |
| 201 | 93% | 28% |
| 202 | 94% | 35% |
| 203 | 93% | 30% |
| 204 | 94% | 27% |
| 205 | 94% | 26% |
| 206 | 94% | 23% |
| 207 | 93% | 31% |
| 208 | 94% | 27% |
| 209 | 94% | 23% |
| 210 | 94% | 28% |
| 211 | 94% | 41% |
| 212 | 93% | 56% |
| 213 | 93% | 43% |
| 214 | 93% | 37% |
| 215 | 93% | 35% |

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|---|---|---|---|---|---|---|---|---|
| 216 | 94% | 33% | 292 | 95% | 7% | 368 | 93% | 22% |
| 217 | 93% | 29% | 293 | 93% | 52% | 369 | 94% | 23% |
| 218 | 94% | 25% | 294 | 93% | 42% | 370 | 94% | 49% |
| 219 | 94% | 23% | 295 | 93% | 40% | 371 | 93% | 40% |
| 220 | 94% | 23% | 296 | 93% | 35% | 372 | 94% | 37% |
| 221 | 94% | 20% | 297 | 94% | 35% | 373 | 94% | 32% |
| 222 | 94% | 29% | 298 | 93% | 36% | 374 | 93% | 26% |
| 223 | 94% | 34% | 299 | 94% | 39% | 375 | 94% | 23% |
| 224 | 93% | 27% | 300 | 94% | 38% | 376 | 94% | 26% |
| 225 | 94% | 28% | 301 | 94% | 30% | 377 | 94% | 28% |
| 226 | 94% | 34% | 302 | 94% | 35% | 378 | 93% | 30% |
| 227 | 93% | 34% | 303 | 94% | 35% | 379 | 93% | 25% |
| 228 | 94% | 29% | 304 | 94% | 36% | 380 | 94% | 24% |
| 229 | 92% | 49% | 305 | 94% | 30% | 381 | 94% | 23% |
| 230 | 94% | 43% | 306 | 93% | 27% | 382 | 94% | 22% |
| 231 | 94% | 39% | 307 | 94% | 27% | 383 | 94% | 20% |
| 232 | 94% | 35% | 308 | 94% | 33% | 384 | 94% | 22% |
| 233 | 93% | 54% | 309 | 94% | 29% | 385 | 94% | 25% |
| 234 | 94% | 50% | 310 | 94% | 25% | 386 | 93% | 36% |
| 235 | 94% | 40% | 311 | 94% | 28% | 387 | 93% | 40% |
| 236 | 94% | 33% | 312 | 95% | 26% | 388 | 94% | 35% |
| 237 | 94% | 37% | 313 | 94% | 95% | 389 | 93% | 33% |
| 238 | 94% | 41% | 314 | 94% | 101% | 390 | 93% | 29% |
| 239 | 93% | 31% | 315 | 93% | 92% | 391 | 93% | 27% |
| 240 | 94% | 25% | 316 | 93% | 64% | 392 | 93% | 23% |
| 241 | 94% | 22% | 317 | 93% | 49% | 393 | 93% | 23% |
| 242 | 94% | 22% | 318 | 94% | 41% | 394 | 93% | 23% |
| 243 | 94% | 26% | 319 | 93% | 37% | 395 | 94% | 23% |
| 244 | 94% | 26% | 320 | 93% | 31% | 396 | 93% | 21% |
| 245 | 94% | 34% | 321 | 94% | 26% | 397 | 93% | 22% |
| 246 | 96% | 30% | 322 | 94% | 36% | 398 | 94% | 22% |
| 247 | 95% | 71% | 323 | 93% | 29% | 399 | 94% | 23% |
| 248 | 94% | 52% | 324 | 93% | 23% | 400 | 94% | 23% |
| 249 | 93% | 42% | 325 | 93% | 21% | 401 | 93% | 24% |
| 250 | 93% | 40% | 326 | 94% | 28% | 402 | 94% | 23% |
| 251 | 93% | 32% | 327 | 93% | 26% | 403 | 93% | 20% |
| 252 | 94% | 31% | 328 | 94% | 35% | 404 | 93% | 21% |
| 253 | 94% | 27% | 329 | 93% | 51% | 405 | 93% | 22% |
| 254 | 94% | 27% | 330 | 94% | 43% | 406 | 93% | 23% |
| 255 | 94% | 28% | 331 | 93% | 33% | 407 | 94% | 23% |
| 256 | 93% | 24% | 332 | 93% | 29% | 408 | 93% | 22% |
| 257 | 94% | 23% | 333 | 96% | 27% | 409 | 93% | 21% |
| 258 | 94% | 28% | 334 | 95% | 22% | 410 | 93% | 23% |
| 259 | 93% | 29% | 335 | 93% | 64% | 411 | 94% | 23% |
| 260 | 93% | 23% | 336 | 93% | 46% | 412 | 93% | 21% |
| 261 | 93% | 26% | 337 | 93% | 37% | 413 | 93% | 21% |
| 262 | 94% | 21% | 338 | 93% | 31% | 414 | 93% | 20% |
| 263 | 93% | 21% | 339 | 93% | 33% | 415 | 94% | 19% |
| 264 | 93% | 24% | 340 | 94% | 33% | 416 | 94% | 21% |
| 265 | 94% | 25% | 341 | 93% | 30% | 417 | 94% | 21% |
| 266 | 94% | 25% | 342 | 93% | 26% | 418 | 93% | 19% |
| 267 | 94% | 34% | 343 | 93% | 34% | 419 | 93% | 22% |
| 268 | 93% | 35% | 344 | 93% | 37% | 420 | 94% | 21% |
| 269 | 93% | 27% | 345 | 94% | 29% | 421 | 94% | 23% |
| 270 | 93% | 23% | 346 | 94% | 27% | 422 | 94% | 25% |
| 271 | 93% | 26% | 347 | 93% | 36% | 423 | 94% | 26% |
| 272 | 93% | 23% | 348 | 95% | 30% | 424 | 94% | 34% |
| 273 | 93% | 25% | 349 | 95% | 22% | 425 | 94% | 28% |
| 274 | 94% | 23% | 350 | 95% | 16% | 426 | 94% | 24% |
| 275 | 93% | 22% | 351 | 95% | 12% | 427 | 94% | 24% |
| 276 | 94% | 26% | 352 | 95% | 10% | 428 | 94% | 25% |
| 277 | 94% | 26% | 353 | 94% | 43% | 429 | 94% | 23% |
| 278 | 93% | 29% | 354 | 93% | 34% | 430 | 94% | 24% |
| 279 | 94% | 29% | 355 | 94% | 28% | 431 | 94% | 25% |
| 280 | 94% | 28% | 356 | 94% | 34% | 432 | 94% | 26% |
| 281 | 94% | 23% | 357 | 94% | 28% | 433 | 94% | 25% |
| 282 | 94% | 45% | 358 | 93% | 33% | 434 | 94% | 26% |
| 283 | 93% | 37% | 359 | 94% | 31% | 435 | 94% | 25% |
| 284 | 94% | 29% | 360 | 94% | 41% | 436 | 94% | 23% |
| 285 | 94% | 28% | 361 | 94% | 31% | 437 | 93% | 23% |
| 286 | 95% | 27% | 362 | 93% | 26% | 438 | 94% | 21% |
| 287 | 95% | 19% | 363 | 94% | 25% | 439 | 93% | 19% |
| 288 | 95% | 14% | 364 | 94% | 23% | 440 | 94% | 18% |
| 289 | 95% | 11% | 365 | 94% | 27% | 441 | 93% | 19% |
| 290 | 95% | 9% | 366 | 94% | 23% | 442 | 94% | 20% |
| 291 | 95% | 8% | 367 | 94% | 23% | 443 | 94% | 21% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 444 | 94% | 20% | 520 | 94% | 47% | 596 | 93% | 24% |
| 445 | 94% | 21% | 521 | 93% | 56% | 597 | 93% | 28% |
| 446 | 94% | 20% | 522 | 94% | 86% | 598 | 93% | 27% |
| 447 | 93% | 46% | 523 | 93% | 56% | 599 | 93% | 24% |
| 448 | 93% | 39% | 524 | 96% | 39% | 600 | 93% | 21% |
| 449 | 94% | 32% | 525 | 93% | 57% | 601 | 93% | 20% |
| 450 | 96% | 28% | 526 | 93% | 43% | 602 | 93% | 24% |
| 451 | 95% | 24% | 527 | 92% | 68% | 603 | 93% | 26% |
| 452 | 95% | 17% | 528 | 93% | 49% | 604 | 93% | 31% |
| 453 | 95% | 13% | 529 | 95% | 35% | 605 | 93% | 26% |
| 454 | 95% | 10% | 530 | 93% | 55% | 606 | 93% | 25% |
| 455 | 95% | 9% | 531 | 93% | 43% | 607 | 93% | 27% |
| 456 | 95% | 8% | 532 | 93% | 73% | 608 | 93% | 26% |
| 457 | 95% | 7% | 533 | 93% | 76% | 609 | 93% | 23% |
| 458 | 95% | 7% | 534 | 95% | 60% | 610 | 94% | 32% |
| 459 | 95% | 6% | 535 | 95% | 44% | 611 | 93% | 29% |
| 460 | 95% | 6% | 536 | 92% | 68% | 612 | 93% | 33% |
| 461 | 95% | 6% | 537 | 94% | 81% | 613 | 92% | 52% |
| 462 | 80% | 5% | 538 | 93% | 73% | 614 | 94% | 63% |
| 463 | 79% | 44% | 539 | 93% | 57% | 615 | 93% | 48% |
| 464 | 94% | 33% | 540 | 94% | 46% | 616 | 95% | 38% |
| 465 | 93% | 27% | 541 | 94% | 71% | 617 | 95% | 26% |
| 466 | 93% | 30% | 542 | 93% | 57% | 618 | 95% | 18% |
| 467 | 94% | 41% | 543 | 93% | 54% | 619 | 95% | 14% |
| 468 | 93% | 33% | 544 | 93% | 46% | 620 | 95% | 10% |
| 469 | 93% | 28% | 545 | 95% | 38% | 621 | 95% | 9% |
| 470 | 93% | 27% | 546 | 93% | 56% | 622 | 92% | 40% |
| 471 | 94% | 30% | 547 | 93% | 41% | 623 | 95% | 31% |
| 472 | 93% | 30% | 548 | 94% | 33% | 624 | 95% | 23% |
| 473 | 93% | 28% | 549 | 92% | 69% | 625 | 93% | 59% |
| 474 | 93% | 29% | 550 | 93% | 48% | 626 | 93% | 47% |
| 475 | 93% | 23% | 551 | 93% | 40% | 627 | 94% | 43% |
| 476 | 93% | 22% | 552 | 92% | 67% | 628 | 94% | 48% |
| 477 | 93% | 30% | 553 | 93% | 46% | 629 | 94% | 37% |
| 478 | 94% | 31% | 554 | 93% | 36% | 630 | 93% | 31% |
| 479 | 94% | 33% | 555 | 96% | 31% | 631 | 93% | 29% |
| 480 | 94% | 29% | 556 | 93% | 61% | 632 | 94% | 26% |
| 481 | 93% | 32% | 557 | 94% | 50% | 633 | 93% | 23% |
| 482 | 93% | 25% | 558 | 94% | 40% | 634 | 93% | 21% |
| 483 | 93% | 22% | 559 | 92% | 64% | 635 | 93% | 26% |
| 484 | 93% | 26% | 560 | 93% | 49% | 636 | 94% | 24% |
| 485 | 94% | 23% | 561 | 94% | 34% | 637 | 93% | 23% |
| 486 | 93% | 19% | 562 | 92% | 62% | 638 | 94% | 20% |
| 487 | 93% | 20% | 563 | 93% | 48% | 639 | 93% | 17% |
| 488 | 93% | 29% | 564 | 94% | 36% | 640 | 93% | 16% |
| 489 | 94% | 23% | 565 | 92% | 62% | 641 | 93% | 17% |
| 490 | 93% | 23% | 566 | 93% | 48% | 642 | 93% | 15% |
| 491 | 94% | 33% | 567 | 93% | 42% | 643 | 93% | 19% |
| 492 | 93% | 39% | 568 | 93% | 69% | 644 | 93% | 19% |
| 493 | 94% | 39% | 569 | 93% | 55% | 645 | 93% | 19% |
| 494 | 93% | 36% | 570 | 94% | 42% | 646 | 93% | 21% |
| 495 | 93% | 36% | 571 | 93% | 30% | 647 | 93% | 23% |
| 496 | 94% | 32% | 572 | 94% | 25% | 648 | 93% | 24% |
| 497 | 94% | 27% | 573 | 93% | 23% | 649 | 93% | 23% |
| 498 | 93% | 23% | 574 | 93% | 22% | 650 | 93% | 23% |
| 499 | 96% | 32% | 575 | 93% | 28% | 651 | 94% | 20% |
| 500 | 95% | 72% | 576 | 93% | 23% | 652 | 93% | 19% |
| 501 | 93% | 56% | 577 | 93% | 21% | 653 | 94% | 20% |
| 502 | 93% | 46% | 578 | 93% | 23% | 654 | 93% | 21% |
| 503 | 93% | 38% | 579 | 95% | 23% | 655 | 93% | 22% |
| 504 | 92% | 62% | 580 | 93% | 47% | 656 | 95% | 23% |
| 505 | 94% | 49% | 581 | 93% | 42% | 657 | 95% | 18% |
| 506 | 94% | 44% | 582 | 93% | 34% | 658 | 95% | 13% |
| 507 | 93% | 59% | 583 | 93% | 30% | 659 | 95% | 10% |
| 508 | 93% | 40% | 584 | 93% | 47% | 660 | 95% | 9% |
| 509 | 96% | 30% | 585 | 93% | 34% | 661 | 95% | 8% |
| 510 | 93% | 70% | 586 | 93% | 59% | 662 | 95% | 7% |
| 511 | 93% | 47% | 587 | 93% | 51% | 663 | 95% | 7% |
| 512 | 96% | 39% | 588 | 93% | 37% | 664 | 95% | 6% |
| 513 | 94% | 66% | 589 | 93% | 29% | 665 | 95% | 6% |
| 514 | 93% | 49% | 590 | 93% | 23% | 666 | 95% | 6% |
| 515 | 94% | 36% | 591 | 93% | 31% | 667 | 95% | 6% |
| 516 | 94% | 68% | 592 | 93% | 26% | 668 | 66% | 5% |
| 517 | 93% | 56% | 593 | 94% | 25% | 669 | 57% | 6% |
| 518 | 93% | 42% | 594 | 93% | 21% | 670 | 58% | 6% |
| 519 | 92% | 67% | 595 | 93% | 29% | 671 | 58% | 6% |

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|---|---|---|---|---|---|---|---|---|
| 672 | 58% | 6% | 748 | 93% | 20% | 824 | 93% | 24% |
| 673 | 58% | 6% | 749 | 93% | 25% | 825 | 93% | 22% |
| 674 | 58% | 6% | 750 | 93% | 25% | 826 | 93% | 21% |
| 675 | 58% | 6% | 751 | 93% | 22% | 827 | 93% | 18% |
| 676 | 58% | 6% | 752 | 93% | 21% | 828 | 93% | 21% |
| 677 | 58% | 6% | 753 | 93% | 18% | 829 | 93% | 19% |
| 678 | 58% | 6% | 754 | 93% | 19% | 830 | 93% | 23% |
| 679 | 58% | 6% | 755 | 96% | 23% | 831 | 93% | 29% |
| 680 | 58% | 6% | 756 | 95% | 19% | 832 | 93% | 41% |
| 681 | 58% | 6% | 757 | 95% | 14% | 833 | 93% | 37% |
| 682 | 58% | 6% | 758 | 95% | 10% | 834 | 93% | 29% |
| 683 | 58% | 6% | 759 | 95% | 9% | 835 | 93% | 24% |
| 684 | 58% | 6% | 760 | 95% | 8% | 836 | 93% | 21% |
| 685 | 58% | 6% | 761 | 95% | 7% | 837 | 93% | 23% |
| 686 | 58% | 6% | 762 | 95% | 7% | 838 | 93% | 20% |
| 687 | 58% | 6% | 763 | 95% | 6% | 839 | 93% | 18% |
| 688 | 58% | 6% | 764 | 95% | 6% | 840 | 93% | 17% |
| 689 | 58% | 6% | 765 | 92% | 53% | 841 | 93% | 18% |
| 690 | 58% | 6% | 766 | 93% | 38% | 842 | 93% | 19% |
| 691 | 58% | 6% | 767 | 93% | 30% | 843 | 93% | 22% |
| 692 | 58% | 6% | 768 | 96% | 30% | 844 | 93% | 21% |
| 693 | 58% | 6% | 769 | 93% | 65% | 845 | 93% | 21% |
| 694 | 58% | 6% | 770 | 94% | 76% | 846 | 93% | 19% |
| 695 | 58% | 6% | 771 | 93% | 53% | 847 | 93% | 19% |
| 696 | 58% | 6% | 772 | 93% | 43% | 848 | 93% | 18% |
| 697 | 74% | 55% | 773 | 93% | 33% | 849 | 93% | 19% |
| 698 | 93% | 45% | 774 | 93% | 29% | 850 | 93% | 17% |
| 699 | 93% | 36% | 775 | 93% | 33% | 851 | 93% | 16% |
| 700 | 93% | 29% | 776 | 96% | 28% | 852 | 93% | 19% |
| 701 | 93% | 23% | 777 | 95% | 69% | 853 | 93% | 18% |
| 702 | 93% | 26% | 778 | 93% | 64% | 854 | 94% | 24% |
| 703 | 93% | 24% | 779 | 93% | 55% | 855 | 93% | 25% |
| 704 | 93% | 20% | 780 | 93% | 43% | 856 | 93% | 25% |
| 705 | 93% | 19% | 781 | 93% | 32% | 857 | 93% | 21% |
| 706 | 93% | 20% | 782 | 93% | 30% | 858 | 93% | 17% |
| 707 | 93% | 24% | 783 | 93% | 42% | 859 | 96% | 19% |
| 708 | 93% | 25% | 784 | 93% | 33% | 860 | 95% | 18% |
| 709 | 93% | 21% | 785 | 93% | 31% | 861 | 93% | 54% |
| 710 | 93% | 19% | 786 | 93% | 24% | 862 | 93% | 61% |
| 711 | 93% | 17% | 787 | 93% | 23% | 863 | 93% | 43% |
| 712 | 93% | 16% | 788 | 93% | 24% | 864 | 93% | 31% |
| 713 | 93% | 20% | 789 | 93% | 20% | 865 | 93% | 24% |
| 714 | 93% | 17% | 790 | 93% | 24% | 866 | 93% | 23% |
| 715 | 93% | 20% | 791 | 93% | 26% | 867 | 93% | 22% |
| 716 | 93% | 22% | 792 | 93% | 24% | 868 | 93% | 21% |
| 717 | 93% | 22% | 793 | 93% | 27% | 869 | 93% | 20% |
| 718 | 93% | 25% | 794 | 93% | 24% | 870 | 93% | 16% |
| 719 | 93% | 42% | 795 | 93% | 22% | 871 | 93% | 16% |
| 720 | 93% | 30% | 796 | 93% | 19% | 872 | 93% | 16% |
| 721 | 93% | 26% | 797 | 93% | 16% | 873 | 93% | 31% |
| 722 | 93% | 22% | 798 | 93% | 15% | 874 | 93% | 30% |
| 723 | 93% | 24% | 799 | 93% | 14% | 875 | 93% | 27% |
| 724 | 93% | 20% | 800 | 93% | 17% | 876 | 93% | 23% |
| 725 | 93% | 18% | 801 | 93% | 22% | 877 | 93% | 23% |
| 726 | 93% | 18% | 802 | 93% | 23% | 878 | 93% | 21% |
| 727 | 93% | 19% | 803 | 93% | 21% | 879 | 93% | 20% |
| 728 | 93% | 17% | 804 | 93% | 18% | 880 | 93% | 18% |
| 729 | 93% | 17% | 805 | 93% | 21% | 881 | 93% | 16% |
| 730 | 94% | 23% | 806 | 93% | 18% | 882 | 93% | 18% |
| 731 | 93% | 21% | 807 | 93% | 18% | 883 | 93% | 16% |
| 732 | 93% | 20% | 808 | 93% | 17% | 884 | 93% | 17% |
| 733 | 93% | 17% | 809 | 96% | 18% | 885 | 93% | 20% |
| 734 | 93% | 16% | 810 | 95% | 17% | 886 | 93% | 20% |
| 735 | 93% | 15% | 811 | 95% | 13% | 887 | 93% | 22% |
| 736 | 93% | 19% | 812 | 94% | 69% | 888 | 93% | 20% |
| 737 | 93% | 19% | 813 | 93% | 54% | 889 | 93% | 17% |
| 738 | 93% | 20% | 814 | 93% | 40% | 890 | 93% | 17% |
| 739 | 93% | 20% | 815 | 93% | 29% | 891 | 93% | 17% |
| 740 | 93% | 20% | 816 | 93% | 24% | 892 | 93% | 16% |
| 741 | 93% | 19% | 817 | 93% | 31% | 893 | 93% | 18% |
| 742 | 93% | 20% | 818 | 93% | 27% | 894 | 93% | 18% |
| 743 | 93% | 18% | 819 | 93% | 29% | 895 | 93% | 21% |
| 744 | 93% | 18% | 820 | 93% | 23% | 896 | 93% | 21% |
| 745 | 93% | 18% | 821 | 93% | 23% | 897 | 93% | 18% |
| 746 | 93% | 16% | 822 | 93% | 21% | 898 | 94% | 24% |
| 747 | 93% | 18% | 823 | 93% | 18% | 899 | 93% | 28% |

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|---|---|---|---|---|---|---|---|---|
| 900 | 93% | 23% | 976 | 93% | 31% | 1052 | 96% | 8% |
| 901 | 93% | 19% | 977 | 93% | 26% | 1053 | 96% | 7% |
| 902 | 93% | 20% | 978 | 93% | 27% | 1054 | 95% | 7% |
| 903 | 93% | 20% | 979 | 93% | 21% | 1055 | 96% | 7% |
| 904 | 93% | 29% | 980 | 93% | 22% | 1056 | 95% | 6% |
| 905 | 93% | 23% | 981 | 93% | 18% | 1057 | 96% | 6% |
| 906 | 93% | 25% | 982 | 93% | 18% | 1058 | 96% | 6% |
| 907 | 93% | 23% | 983 | 93% | 19% | 1059 | 88% | 5% |
| 908 | 93% | 23% | 984 | 93% | 19% | 1060 | 89% | 49% |
| 909 | 93% | 23% | 985 | 93% | 23% | 1061 | 93% | 34% |
| 910 | 93% | 21% | 986 | 93% | 22% | 1062 | 93% | 27% |
| 911 | 93% | 21% | 987 | 93% | 20% | 1063 | 93% | 26% |
| 912 | 93% | 22% | 988 | 93% | 23% | 1064 | 93% | 25% |
| 913 | 93% | 30% | 989 | 93% | 20% | 1065 | 93% | 22% |
| 914 | 93% | 33% | 990 | 93% | 18% | 1066 | 93% | 23% |
| 915 | 93% | 25% | 991 | 93% | 18% | 1067 | 93% | 21% |
| 916 | 93% | 29% | 992 | 93% | 16% | 1068 | 93% | 21% |
| 917 | 93% | 27% | 993 | 93% | 19% | 1069 | 93% | 23% |
| 918 | 93% | 23% | 994 | 94% | 25% | 1070 | 93% | 23% |
| 919 | 93% | 21% | 995 | 93% | 30% | 1071 | 93% | 23% |
| 920 | 93% | 21% | 996 | 93% | 29% | 1072 | 93% | 23% |
| 921 | 93% | 19% | 997 | 93% | 23% | 1073 | 93% | 23% |
| 922 | 93% | 20% | 998 | 93% | 24% | 1074 | 93% | 22% |
| 923 | 93% | 24% | 999 | 93% | 22% | 1075 | 93% | 22% |
| 924 | 93% | 23% | 1000 | 94% | 20% | 1076 | 93% | 24% |
| 925 | 93% | 21% | 1001 | 93% | 17% | 1077 | 93% | 23% |
| 926 | 93% | 44% | 1002 | 93% | 16% | 1078 | 93% | 23% |
| 927 | 93% | 34% | 1003 | 93% | 16% | 1079 | 93% | 21% |
| 928 | 93% | 28% | 1004 | 93% | 15% | 1080 | 93% | 19% |
| 929 | 93% | 37% | 1005 | 93% | 17% | 1081 | 93% | 20% |
| 930 | 93% | 29% | 1006 | 93% | 18% | 1082 | 93% | 20% |
| 931 | 93% | 27% | 1007 | 93% | 20% | 1083 | 93% | 22% |
| 932 | 93% | 33% | 1008 | 93% | 21% | 1084 | 93% | 26% |
| 933 | 93% | 28% | 1009 | 93% | 18% | 1085 | 93% | 21% |
| 934 | 93% | 22% | 1010 | 93% | 17% | 1086 | 93% | 20% |
| 935 | 96% | 30% | 1011 | 92% | 54% | 1087 | 93% | 18% |
| 936 | 95% | 25% | 1012 | 93% | 38% | 1088 | 93% | 22% |
| 937 | 95% | 17% | 1013 | 93% | 29% | 1089 | 93% | 20% |
| 938 | 95% | 13% | 1014 | 93% | 24% | 1090 | 94% | 27% |
| 939 | 95% | 10% | 1015 | 93% | 24% | 1091 | 93% | 22% |
| 940 | 95% | 9% | 1016 | 93% | 24% | 1092 | 93% | 23% |
| 941 | 95% | 8% | 1017 | 93% | 23% | 1093 | 93% | 21% |
| 942 | 95% | 7% | 1018 | 93% | 20% | 1094 | 93% | 22% |
| 943 | 95% | 7% | 1019 | 93% | 20% | 1095 | 95% | 22% |
| 944 | 95% | 6% | 1020 | 93% | 18% | 1096 | 95% | 16% |
| 945 | 95% | 6% | 1021 | 93% | 19% | 1097 | 95% | 12% |
| 946 | 93% | 37% | 1022 | 93% | 19% | 1098 | 95% | 10% |
| 947 | 93% | 34% | 1023 | 93% | 16% | 1099 | 95% | 9% |
| 948 | 93% | 29% | 1024 | 93% | 16% | 1100 | 95% | 7% |
| 949 | 93% | 23% | 1025 | 93% | 16% | 1101 | 96% | 7% |
| 950 | 93% | 23% | 1026 | 93% | 17% | 1102 | 95% | 7% |
| 951 | 93% | 21% | 1027 | 93% | 21% | 1103 | 95% | 6% |
| 952 | 93% | 20% | 1028 | 93% | 20% | 1104 | 92% | 42% |
| 953 | 93% | 29% | 1029 | 93% | 20% | 1105 | 93% | 36% |
| 954 | 93% | 27% | 1030 | 93% | 17% | 1106 | 93% | 33% |
| 955 | 93% | 26% | 1031 | 93% | 19% | 1107 | 92% | 60% |
| 956 | 93% | 35% | 1032 | 93% | 16% | 1108 | 93% | 48% |
| 957 | 93% | 43% | 1033 | 93% | 18% | 1109 | 93% | 36% |
| 958 | 95% | 35% | 1034 | 93% | 16% | 1110 | 93% | 30% |
| 959 | 95% | 24% | 1035 | 93% | 16% | 1111 | 93% | 28% |
| 960 | 95% | 17% | 1036 | 93% | 16% | 1112 | 93% | 24% |
| 961 | 95% | 13% | 1037 | 93% | 17% | 1113 | 93% | 24% |
| 962 | 95% | 10% | 1038 | 93% | 16% | 1114 | 93% | 23% |
| 963 | 95% | 9% | 1039 | 93% | 17% | 1115 | 93% | 23% |
| 964 | 95% | 8% | 1040 | 93% | 18% | 1116 | 93% | 25% |
| 965 | 95% | 7% | 1041 | 93% | 17% | 1117 | 93% | 27% |
| 966 | 95% | 7% | 1042 | 93% | 16% | 1118 | 93% | 29% |
| 967 | 95% | 6% | 1043 | 93% | 17% | 1119 | 93% | 26% |
| 968 | 93% | 36% | 1044 | 93% | 17% | 1120 | 93% | 26% |
| 969 | 93% | 30% | 1045 | 93% | 22% | 1121 | 93% | 21% |
| 970 | 93% | 25% | 1046 | 93% | 19% | 1122 | 93% | 23% |
| 971 | 93% | 21% | 1047 | 93% | 19% | 1123 | 93% | 23% |
| 972 | 93% | 22% | 1048 | 95% | 21% | 1124 | 94% | 23% |
| 973 | 93% | 19% | 1049 | 95% | 16% | 1125 | 93% | 40% |
| 974 | 93% | 34% | 1050 | 95% | 12% | 1126 | 94% | 67% |
| 975 | 93% | 36% | 1051 | 95% | 10% | 1127 | 93% | 46% |

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|---|---|---|---|---|---|---|---|---|
| 1128 | 93% | 38% | 1153 | 93% | 24% | 1177 | 79% | 21% |
| 1129 | 93% | 29% | 1154 | 93% | 28% | 1178 | 72% | 16% |
| 1130 | 93% | 28% | 1155 | 93% | 23% | 1179 | 65% | 10% |
| 1131 | 93% | 27% | 1156 | 93% | 24% | 1180 | 58% | 5% |
| 1132 | 93% | 29% | 1157 | 93% | 34% | 1181 | 58% | 5% |
| 1133 | 93% | 28% | 1158 | 93% | 31% | 1182 | 58% | 5% |
| 1134 | 94% | 33% | 1159 | 93% | 35% | 1183 | 58% | 5% |
| 1135 | 93% | 31% | 1160 | 93% | 31% | 1184 | 58% | 5% |
| 1136 | 93% | 30% | 1161 | 93% | 32% | 1185 | 58% | 5% |
| 1137 | 94% | 42% | 1162 | 93% | 31% | 1186 | 58% | 5% |
| 1138 | 93% | 31% | 1163 | 93% | 30% | 1187 | 58% | 5% |
| 1139 | 93% | 29% | 1164 | 93% | 23% | 1188 | 58% | 5% |
| 1140 | 93% | 27% | 1165 | 93% | 23% | 1189 | 58% | 5% |
| 1141 | 93% | 23% | 1166 | 93% | 36% | 1190 | 58% | 5% |
| 1142 | 93% | 23% | 1167 | 93% | 32% | 1191 | 58% | 5% |
| 1143 | 93% | 20% | 1168 | 93% | 25% | 1192 | 58% | 5% |
| 1144 | 93% | 20% | 1169 | 93% | 31% | 1193 | 58% | 5% |
| 1145 | 93% | 23% | 1170 | 93% | 33% | 1194 | 58% | 5% |
| 1146 | 93% | 22% | 1171 | 93% | 33% | 1195 | 58% | 5% |
| 1147 | 93% | 23% | 1172 | 93% | 33% | 1196 | 58% | 5% |
| 1148 | 93% | 25% | 1173 | 93% | 33% | 1197 | 58% | 5% |
| 1149 | 93% | 20% | 1174 | 93% | 33% | 1198 | 58% | 5% |
| 1150 | 93% | 25% | 1175 | 93% | 33% | 1199 | 58% | 5% |
| 1151 | 93% | 23% | 1176 | 86% | 28% | | | |
| 1152 | 93% | 23% | | | | | | |

Appendix II to Part 1039— Nonroad Compression-ignition (CI) Composite Transient Cycle

| Time (s) | Normalized Speed | Normalized Torque |
|---|---|---|
| 1 | 0% | 0% |
| 2 | 0% | 0% |
| 3 | 0% | 0% |
| 4 | 0% | 0% |
| 5 | 0% | 0% |
| 6 | 0% | 0% |
| 7 | 0% | 0% |
| 8 | 0% | 0% |
| 9 | 0% | 0% |
| 10 | 0% | 0% |
| 11 | 0% | 0% |
| 12 | 0% | 0% |
| 13 | 0% | 0% |
| 14 | 0% | 0% |
| 15 | 0% | 0% |
| 16 | 0% | 0% |
| 17 | 0% | 0% |
| 18 | 0% | 0% |
| 19 | 0% | 0% |
| 20 | 0% | 0% |
| 21 | 0% | 0% |
| 22 | 0% | 0% |
| 23 | 0% | 0% |
| 24 | 1% | 3% |
| 25 | 1% | 3% |
| 26 | 1% | 3% |
| 27 | 1% | 3% |
| 28 | 1% | 3% |
| 29 | 1% | 3% |
| 30 | 1% | 6% |
| 31 | 1% | 6% |
| 32 | 2% | 1% |
| 33 | 4% | 13% |
| 34 | 7% | 18% |
| 35 | 9% | 21% |
| 36 | 17% | 20% |
| 37 | 33% | 42% |
| 38 | 57% | 46% |
| 39 | 44% | 33% |
| 40 | 31% | 0% |
| 41 | 22% | 27% |
| 42 | 33% | 43% |
| 43 | 80% | 49% |
| 44 | 105% | 47% |
| 45 | 98% | 70% |
| 46 | 104% | 36% |
| 47 | 104% | 65% |
| 48 | 96% | 71% |
| 49 | 101% | 62% |
| 50 | 102% | 51% |
| 51 | 102% | 50% |
| 52 | 102% | 46% |
| 53 | 102% | 41% |
| 54 | 102% | 31% |
| 55 | 89% | 2% |
| 56 | 82% | 0% |
| 57 | 47% | 1% |
| 58 | 23% | 1% |
| 59 | 1% | 3% |
| 60 | 1% | 8% |
| 61 | 1% | 3% |
| 62 | 1% | 5% |
| 63 | 1% | 6% |
| 64 | 1% | 4% |
| 65 | 1% | 4% |
| 66 | 0% | 6% |
| 67 | 1% | 4% |
| 68 | 9% | 21% |
| 69 | 25% | 56% |
| 70 | 64% | 26% |
| 71 | 60% | 31% |
| 72 | 63% | 20% |
| 73 | 62% | 24% |
| 74 | 64% | 8% |
| 75 | 58% | 44% |
| 76 | 65% | 10% |
| 77 | 65% | 12% |
| 78 | 68% | 23% |
| 79 | 69% | 30% |
| 80 | 71% | 30% |
| 81 | 74% | 15% |
| 82 | 71% | 23% |
| 83 | 73% | 20% |
| 84 | 73% | 21% |
| 85 | 73% | 19% |
| 86 | 70% | 33% |
| 87 | 70% | 34% |
| 88 | 65% | 47% |
| 89 | 66% | 47% |
| 90 | 64% | 53% |
| 91 | 65% | 45% |
| 92 | 66% | 38% |
| 93 | 67% | 49% |
| 94 | 69% | 39% |
| 95 | 69% | 39% |
| 96 | 66% | 42% |
| 97 | 71% | 29% |
| 98 | 75% | 29% |
| 99 | 72% | 23% |
| 100 | 74% | 22% |
| 101 | 75% | 24% |
| 102 | 73% | 30% |
| 103 | 74% | 24% |
| 104 | 77% | 6% |
| 105 | 76% | 12% |
| 106 | 74% | 39% |
| 107 | 72% | 30% |
| 108 | 75% | 22% |
| 109 | 78% | 64% |
| 110 | 102% | 34% |
| 111 | 103% | 28% |
| 112 | 103% | 28% |
| 113 | 103% | 19% |
| 114 | 103% | 32% |
| 115 | 104% | 25% |
| 116 | 103% | 38% |
| 117 | 103% | 39% |
| 118 | 103% | 34% |
| 119 | 102% | 44% |
| 120 | 103% | 38% |
| 121 | 102% | 43% |
| 122 | 103% | 34% |
| 123 | 102% | 41% |
| 124 | 103% | 44% |
| 125 | 103% | 37% |
| 126 | 103% | 27% |
| 127 | 104% | 13% |
| 128 | 104% | 30% |
| 129 | 104% | 19% |
| 130 | 103% | 28% |
| 131 | 104% | 40% |
| 132 | 104% | 32% |
| 133 | 101% | 63% |
| 134 | 102% | 54% |
| 135 | 102% | 52% |
| 136 | 102% | 51% |
| 137 | 103% | 40% |
| 138 | 104% | 34% |
| 139 | 102% | 36% |
| 140 | 104% | 44% |
| 141 | 103% | 44% |
| 142 | 104% | 33% |
| 143 | 102% | 27% |
| 144 | 103% | 26% |
| 145 | 79% | 53% |
| 146 | 51% | 37% |
| 147 | 24% | 23% |
| 148 | 13% | 33% |
| 149 | 19% | 55% |
| 150 | 45% | 30% |
| 151 | 34% | 7% |
| 152 | 14% | 4% |
| 153 | 8% | 16% |
| 154 | 15% | 6% |
| 155 | 39% | 47% |
| 156 | 39% | 4% |
| 157 | 35% | 26% |
| 158 | 27% | 38% |
| 159 | 43% | 40% |
| 160 | 14% | 23% |
| 161 | 10% | 10% |
| 162 | 15% | 33% |
| 163 | 35% | 72% |
| 164 | 60% | 39% |
| 165 | 55% | 31% |
| 166 | 47% | 30% |
| 167 | 16% | 7% |
| 168 | 0% | 6% |
| 169 | 0% | 8% |
| 170 | 0% | 8% |
| 171 | 0% | 2% |
| 172 | 2% | 17% |
| 173 | 10% | 28% |
| 174 | 28% | 31% |
| 175 | 33% | 30% |
| 176 | 36% | 0% |
| 177 | 19% | 10% |
| 178 | 1% | 18% |
| 179 | 0% | 16% |
| 180 | 1% | 3% |
| 181 | 1% | 4% |
| 182 | 1% | 5% |
| 183 | 1% | 6% |
| 184 | 1% | 5% |
| 185 | 1% | 3% |
| 186 | 1% | 4% |
| 187 | 1% | 4% |
| 188 | 1% | 6% |
| 189 | 8% | 18% |
| 190 | 20% | 51% |
| 191 | 49% | 19% |
| 192 | 41% | 13% |
| 193 | 31% | 16% |
| 194 | 28% | 21% |
| 195 | 21% | 17% |
| 196 | 31% | 21% |
| 197 | 21% | 8% |
| 198 | 0% | 14% |
| 199 | 0% | 12% |
| 200 | 3% | 8% |
| 201 | 3% | 22% |
| 202 | 12% | 20% |
| 203 | 14% | 20% |
| 204 | 16% | 17% |
| 205 | 20% | 18% |
| 206 | 27% | 34% |
| 207 | 32% | 33% |
| 208 | 41% | 31% |
| 209 | 43% | 31% |
| 210 | 37% | 33% |
| 211 | 26% | 18% |
| 212 | 18% | 29% |
| 213 | 14% | 51% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 214 | 13% | 11% | 290 | 82% | 63% | 366 | 76% | 50% |
| 215 | 12% | 9% | 291 | 61% | 47% | 367 | 45% | 52% |
| 216 | 15% | 33% | 292 | 52% | 37% | 368 | 61% | 98% |
| 217 | 20% | 25% | 293 | 24% | 0% | 369 | 61% | 69% |
| 218 | 25% | 17% | 294 | 20% | 7% | 370 | 63% | 49% |
| 219 | 31% | 29% | 295 | 39% | 48% | 371 | 32% | 0% |
| 220 | 36% | 66% | 296 | 39% | 54% | 372 | 10% | 8% |
| 221 | 66% | 40% | 297 | 63% | 58% | 373 | 17% | 7% |
| 222 | 50% | 13% | 298 | 53% | 31% | 374 | 16% | 13% |
| 223 | 16% | 24% | 299 | 51% | 24% | 375 | 11% | 6% |
| 224 | 26% | 50% | 300 | 48% | 40% | 376 | 9% | 5% |
| 225 | 64% | 23% | 301 | 39% | 0% | 377 | 9% | 12% |
| 226 | 81% | 20% | 302 | 35% | 18% | 378 | 12% | 46% |
| 227 | 83% | 11% | 303 | 36% | 16% | 379 | 15% | 30% |
| 228 | 79% | 23% | 304 | 29% | 17% | 380 | 26% | 28% |
| 229 | 76% | 31% | 305 | 28% | 21% | 381 | 13% | 9% |
| 230 | 68% | 24% | 306 | 31% | 15% | 382 | 16% | 21% |
| 231 | 59% | 33% | 307 | 31% | 10% | 383 | 24% | 4% |
| 232 | 59% | 3% | 308 | 43% | 19% | 384 | 36% | 43% |
| 233 | 25% | 7% | 309 | 49% | 63% | 385 | 65% | 85% |
| 234 | 21% | 10% | 310 | 78% | 61% | 386 | 78% | 66% |
| 235 | 20% | 19% | 311 | 78% | 46% | 387 | 63% | 39% |
| 236 | 4% | 10% | 312 | 66% | 65% | 388 | 32% | 34% |
| 237 | 5% | 7% | 313 | 78% | 97% | 389 | 46% | 55% |
| 238 | 4% | 5% | 314 | 84% | 63% | 390 | 47% | 42% |
| 239 | 4% | 6% | 315 | 57% | 26% | 391 | 42% | 39% |
| 240 | 4% | 6% | 316 | 36% | 22% | 392 | 27% | 0% |
| 241 | 4% | 5% | 317 | 20% | 34% | 393 | 14% | 5% |
| 242 | 7% | 5% | 318 | 19% | 8% | 394 | 14% | 14% |
| 243 | 16% | 28% | 319 | 9% | 10% | 395 | 24% | 54% |
| 244 | 28% | 25% | 320 | 5% | 5% | 396 | 60% | 90% |
| 245 | 52% | 53% | 321 | 7% | 11% | 397 | 53% | 66% |
| 246 | 50% | 8% | 322 | 15% | 15% | 398 | 70% | 48% |
| 247 | 26% | 40% | 323 | 12% | 9% | 399 | 77% | 93% |
| 248 | 48% | 29% | 324 | 13% | 27% | 400 | 79% | 67% |
| 249 | 54% | 39% | 325 | 15% | 28% | 401 | 46% | 65% |
| 250 | 60% | 42% | 326 | 16% | 28% | 402 | 69% | 98% |
| 251 | 48% | 18% | 327 | 16% | 31% | 403 | 80% | 97% |
| 252 | 54% | 51% | 328 | 15% | 20% | 404 | 74% | 97% |
| 253 | 88% | 90% | 329 | 17% | 0% | 405 | 75% | 98% |
| 254 | 103% | 84% | 330 | 20% | 34% | 406 | 56% | 61% |
| 255 | 103% | 85% | 331 | 21% | 25% | 407 | 42% | 0% |
| 256 | 102% | 84% | 332 | 20% | 0% | 408 | 36% | 32% |
| 257 | 58% | 66% | 333 | 23% | 25% | 409 | 34% | 43% |
| 258 | 64% | 97% | 334 | 30% | 58% | 410 | 68% | 83% |
| 259 | 56% | 80% | 335 | 63% | 96% | 411 | 102% | 48% |
| 260 | 51% | 67% | 336 | 83% | 60% | 412 | 62% | 0% |
| 261 | 52% | 96% | 337 | 61% | 0% | 413 | 41% | 39% |
| 262 | 63% | 62% | 338 | 26% | 0% | 414 | 71% | 86% |
| 263 | 71% | 6% | 339 | 29% | 44% | 415 | 91% | 52% |
| 264 | 33% | 16% | 340 | 68% | 97% | 416 | 89% | 55% |
| 265 | 47% | 45% | 341 | 80% | 97% | 417 | 89% | 56% |
| 266 | 43% | 56% | 342 | 88% | 97% | 418 | 88% | 58% |
| 267 | 42% | 27% | 343 | 99% | 88% | 419 | 78% | 69% |
| 268 | 42% | 64% | 344 | 102% | 86% | 420 | 98% | 39% |
| 269 | 75% | 74% | 345 | 100% | 82% | 421 | 64% | 61% |
| 270 | 68% | 96% | 346 | 74% | 79% | 422 | 90% | 34% |
| 271 | 86% | 61% | 347 | 57% | 79% | 423 | 88% | 38% |
| 272 | 66% | 0% | 348 | 76% | 97% | 424 | 97% | 62% |
| 273 | 37% | 0% | 349 | 84% | 97% | 425 | 100% | 53% |
| 274 | 45% | 37% | 350 | 86% | 97% | 426 | 81% | 58% |
| 275 | 68% | 96% | 351 | 81% | 98% | 427 | 74% | 51% |
| 276 | 80% | 97% | 352 | 83% | 83% | 428 | 76% | 57% |
| 277 | 92% | 96% | 353 | 65% | 96% | 429 | 76% | 72% |
| 278 | 90% | 97% | 354 | 93% | 72% | 430 | 85% | 72% |
| 279 | 82% | 96% | 355 | 63% | 60% | 431 | 84% | 60% |
| 280 | 94% | 81% | 356 | 72% | 49% | 432 | 83% | 72% |
| 281 | 90% | 85% | 357 | 56% | 27% | 433 | 83% | 72% |
| 282 | 96% | 65% | 358 | 29% | 0% | 434 | 86% | 72% |
| 283 | 70% | 96% | 359 | 18% | 13% | 435 | 89% | 72% |
| 284 | 55% | 95% | 360 | 25% | 11% | 436 | 86% | 72% |
| 285 | 70% | 96% | 361 | 28% | 24% | 437 | 87% | 72% |
| 286 | 79% | 96% | 362 | 34% | 53% | 438 | 88% | 72% |
| 287 | 81% | 71% | 363 | 65% | 83% | 439 | 88% | 71% |
| 288 | 71% | 60% | 364 | 80% | 44% | 440 | 87% | 72% |
| 289 | 92% | 65% | 365 | 77% | 46% | 441 | 85% | 71% |

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| 442 | 88% | 72% | 518 | 85% | 73% | 594 | 102% | 56% |
| 443 | 88% | 72% | 519 | 83% | 73% | 595 | 103% | 61% |
| 444 | 84% | 72% | 520 | 79% | 73% | 596 | 102% | 64% |
| 445 | 83% | 73% | 521 | 78% | 73% | 597 | 103% | 60% |
| 446 | 77% | 73% | 522 | 81% | 73% | 598 | 93% | 72% |
| 447 | 74% | 73% | 523 | 82% | 72% | 599 | 86% | 73% |
| 448 | 76% | 72% | 524 | 94% | 56% | 600 | 76% | 73% |
| 449 | 46% | 77% | 525 | 66% | 48% | 601 | 59% | 49% |
| 450 | 78% | 62% | 526 | 35% | 71% | 602 | 46% | 22% |
| 451 | 79% | 35% | 527 | 51% | 44% | 603 | 40% | 65% |
| 452 | 82% | 38% | 528 | 60% | 23% | 604 | 72% | 31% |
| 453 | 81% | 41% | 529 | 64% | 10% | 605 | 72% | 27% |
| 454 | 79% | 37% | 530 | 63% | 14% | 606 | 67% | 44% |
| 455 | 78% | 35% | 531 | 70% | 37% | 607 | 68% | 37% |
| 456 | 78% | 38% | 532 | 76% | 45% | 608 | 67% | 42% |
| 457 | 78% | 46% | 533 | 78% | 18% | 609 | 68% | 50% |
| 458 | 75% | 49% | 534 | 76% | 51% | 610 | 77% | 43% |
| 459 | 73% | 50% | 535 | 75% | 33% | 611 | 58% | 4% |
| 460 | 79% | 58% | 536 | 81% | 17% | 612 | 22% | 37% |
| 461 | 79% | 71% | 537 | 76% | 45% | 613 | 57% | 69% |
| 462 | 83% | 44% | 538 | 76% | 30% | 614 | 68% | 38% |
| 463 | 53% | 48% | 539 | 80% | 14% | 615 | 73% | 2% |
| 464 | 40% | 48% | 540 | 71% | 18% | 616 | 40% | 14% |
| 465 | 51% | 75% | 541 | 71% | 14% | 617 | 42% | 38% |
| 466 | 75% | 72% | 542 | 71% | 11% | 618 | 64% | 69% |
| 467 | 89% | 67% | 543 | 65% | 2% | 619 | 64% | 74% |
| 468 | 93% | 60% | 544 | 31% | 26% | 620 | 67% | 73% |
| 469 | 89% | 73% | 545 | 24% | 72% | 621 | 65% | 73% |
| 470 | 86% | 73% | 546 | 64% | 70% | 622 | 68% | 73% |
| 471 | 81% | 73% | 547 | 77% | 62% | 623 | 65% | 49% |
| 472 | 78% | 73% | 548 | 80% | 68% | 624 | 81% | 0% |
| 473 | 78% | 73% | 549 | 83% | 53% | 625 | 37% | 25% |
| 474 | 76% | 73% | 550 | 83% | 50% | 626 | 24% | 69% |
| 475 | 79% | 73% | 551 | 83% | 50% | 627 | 68% | 71% |
| 476 | 82% | 73% | 552 | 85% | 43% | 628 | 70% | 71% |
| 477 | 86% | 73% | 553 | 86% | 45% | 629 | 76% | 70% |
| 478 | 88% | 72% | 554 | 89% | 35% | 630 | 71% | 72% |
| 479 | 92% | 71% | 555 | 82% | 61% | 631 | 73% | 69% |
| 480 | 97% | 54% | 556 | 87% | 50% | 632 | 76% | 70% |
| 481 | 73% | 43% | 557 | 85% | 55% | 633 | 77% | 72% |
| 482 | 36% | 64% | 558 | 89% | 49% | 634 | 77% | 72% |
| 483 | 63% | 31% | 559 | 87% | 70% | 635 | 77% | 72% |
| 484 | 78% | 1% | 560 | 91% | 39% | 636 | 77% | 70% |
| 485 | 69% | 27% | 561 | 72% | 3% | 637 | 76% | 71% |
| 486 | 67% | 28% | 562 | 43% | 25% | 638 | 76% | 71% |
| 487 | 72% | 9% | 563 | 30% | 60% | 639 | 77% | 71% |
| 488 | 71% | 9% | 564 | 40% | 45% | 640 | 77% | 71% |
| 489 | 78% | 36% | 565 | 37% | 32% | 641 | 78% | 70% |
| 490 | 81% | 56% | 566 | 37% | 32% | 642 | 77% | 70% |
| 491 | 75% | 53% | 567 | 43% | 70% | 643 | 77% | 71% |
| 492 | 60% | 45% | 568 | 70% | 54% | 644 | 79% | 72% |
| 493 | 50% | 37% | 569 | 77% | 47% | 645 | 78% | 70% |
| 494 | 66% | 41% | 570 | 79% | 66% | 646 | 80% | 70% |
| 495 | 51% | 61% | 571 | 85% | 53% | 647 | 82% | 71% |
| 496 | 68% | 47% | 572 | 83% | 57% | 648 | 84% | 71% |
| 497 | 29% | 42% | 573 | 86% | 52% | 649 | 83% | 71% |
| 498 | 24% | 73% | 574 | 85% | 51% | 650 | 83% | 73% |
| 499 | 64% | 71% | 575 | 70% | 39% | 651 | 81% | 70% |
| 500 | 90% | 71% | 576 | 50% | 5% | 652 | 80% | 71% |
| 501 | 100% | 61% | 577 | 38% | 36% | 653 | 78% | 71% |
| 502 | 94% | 73% | 578 | 30% | 71% | 654 | 76% | 70% |
| 503 | 84% | 73% | 579 | 75% | 53% | 655 | 76% | 70% |
| 504 | 79% | 73% | 580 | 84% | 40% | 656 | 76% | 71% |
| 505 | 75% | 72% | 581 | 85% | 42% | 657 | 79% | 71% |
| 506 | 78% | 73% | 582 | 86% | 49% | 658 | 78% | 71% |
| 507 | 80% | 73% | 583 | 86% | 57% | 659 | 81% | 70% |
| 508 | 81% | 73% | 584 | 89% | 68% | 660 | 83% | 72% |
| 509 | 81% | 73% | 585 | 99% | 61% | 661 | 84% | 71% |
| 510 | 83% | 73% | 586 | 77% | 29% | 662 | 86% | 71% |
| 511 | 85% | 73% | 587 | 81% | 72% | 663 | 87% | 71% |
| 512 | 84% | 73% | 588 | 89% | 69% | 664 | 92% | 72% |
| 513 | 85% | 73% | 589 | 49% | 56% | 665 | 91% | 72% |
| 514 | 86% | 73% | 590 | 79% | 70% | 666 | 90% | 71% |
| 515 | 85% | 73% | 591 | 104% | 59% | 667 | 90% | 71% |
| 516 | 85% | 73% | 592 | 103% | 54% | 668 | 91% | 71% |
| 517 | 85% | 72% | 593 | 102% | 56% | 669 | 90% | 70% |

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| 670 | 90% | 72% | 746 | 102% | 45% | 822 | 80% | 23% |
| 671 | 91% | 71% | 747 | 103% | 42% | 823 | 80% | 23% |
| 672 | 90% | 71% | 748 | 103% | 46% | 824 | 80% | 20% |
| 673 | 90% | 71% | 749 | 103% | 38% | 825 | 81% | 19% |
| 674 | 92% | 72% | 750 | 102% | 48% | 826 | 80% | 18% |
| 675 | 93% | 69% | 751 | 103% | 35% | 827 | 81% | 17% |
| 676 | 90% | 70% | 752 | 102% | 48% | 828 | 80% | 20% |
| 677 | 93% | 72% | 753 | 103% | 49% | 829 | 81% | 24% |
| 678 | 91% | 70% | 754 | 102% | 48% | 830 | 81% | 21% |
| 679 | 89% | 71% | 755 | 102% | 46% | 831 | 80% | 26% |
| 680 | 91% | 71% | 756 | 103% | 47% | 832 | 80% | 24% |
| 681 | 90% | 71% | 757 | 102% | 49% | 833 | 80% | 23% |
| 682 | 90% | 71% | 758 | 102% | 42% | 834 | 80% | 22% |
| 683 | 92% | 71% | 759 | 102% | 52% | 835 | 81% | 21% |
| 684 | 91% | 71% | 760 | 102% | 57% | 836 | 81% | 24% |
| 685 | 93% | 71% | 761 | 102% | 55% | 837 | 81% | 24% |
| 686 | 93% | 68% | 762 | 102% | 61% | 838 | 81% | 22% |
| 687 | 98% | 68% | 763 | 102% | 61% | 839 | 81% | 22% |
| 688 | 98% | 67% | 764 | 102% | 58% | 840 | 81% | 21% |
| 689 | 100% | 69% | 765 | 103% | 58% | 841 | 81% | 31% |
| 690 | 99% | 68% | 766 | 102% | 59% | 842 | 81% | 27% |
| 691 | 100% | 71% | 767 | 102% | 54% | 843 | 80% | 26% |
| 692 | 99% | 68% | 768 | 102% | 63% | 844 | 80% | 26% |
| 693 | 100% | 69% | 769 | 102% | 61% | 845 | 81% | 25% |
| 694 | 102% | 72% | 770 | 103% | 55% | 846 | 80% | 21% |
| 695 | 101% | 69% | 771 | 102% | 60% | 847 | 81% | 20% |
| 696 | 100% | 69% | 772 | 102% | 72% | 848 | 83% | 21% |
| 697 | 102% | 71% | 773 | 103% | 56% | 849 | 83% | 15% |
| 698 | 102% | 71% | 774 | 102% | 55% | 850 | 83% | 12% |
| 699 | 102% | 69% | 775 | 102% | 67% | 851 | 83% | 9% |
| 700 | 102% | 71% | 776 | 103% | 56% | 852 | 83% | 8% |
| 701 | 102% | 68% | 777 | 84% | 42% | 853 | 83% | 7% |
| 702 | 100% | 69% | 778 | 48% | 7% | 854 | 83% | 6% |
| 703 | 102% | 70% | 779 | 48% | 6% | 855 | 83% | 6% |
| 704 | 102% | 68% | 780 | 48% | 6% | 856 | 83% | 6% |
| 705 | 102% | 70% | 781 | 48% | 7% | 857 | 83% | 6% |
| 706 | 102% | 72% | 782 | 48% | 6% | 858 | 83% | 6% |
| 707 | 102% | 68% | 783 | 48% | 7% | 859 | 76% | 5% |
| 708 | 102% | 69% | 784 | 67% | 21% | 860 | 49% | 8% |
| 709 | 100% | 68% | 785 | 105% | 59% | 861 | 51% | 7% |
| 710 | 102% | 71% | 786 | 105% | 96% | 862 | 51% | 20% |
| 711 | 101% | 64% | 787 | 105% | 74% | 863 | 78% | 52% |
| 712 | 102% | 69% | 788 | 105% | 66% | 864 | 80% | 38% |
| 713 | 102% | 69% | 789 | 105% | 62% | 865 | 81% | 33% |
| 714 | 101% | 69% | 790 | 105% | 66% | 866 | 83% | 29% |
| 715 | 102% | 64% | 791 | 89% | 41% | 867 | 83% | 22% |
| 716 | 102% | 69% | 792 | 52% | 5% | 868 | 83% | 16% |
| 717 | 102% | 68% | 793 | 48% | 5% | 869 | 83% | 12% |
| 718 | 102% | 70% | 794 | 48% | 7% | 870 | 83% | 9% |
| 719 | 102% | 69% | 795 | 48% | 5% | 871 | 83% | 8% |
| 720 | 102% | 70% | 796 | 48% | 6% | 872 | 83% | 7% |
| 721 | 102% | 70% | 797 | 48% | 4% | 873 | 83% | 6% |
| 722 | 102% | 62% | 798 | 52% | 6% | 874 | 83% | 6% |
| 723 | 104% | 38% | 799 | 51% | 5% | 875 | 83% | 6% |
| 724 | 104% | 15% | 800 | 51% | 6% | 876 | 83% | 6% |
| 725 | 102% | 24% | 801 | 51% | 6% | 877 | 83% | 6% |
| 726 | 102% | 45% | 802 | 52% | 5% | 878 | 59% | 4% |
| 727 | 102% | 47% | 803 | 52% | 5% | 879 | 50% | 5% |
| 728 | 104% | 40% | 804 | 57% | 44% | 880 | 51% | 5% |
| 729 | 101% | 52% | 805 | 98% | 90% | 881 | 51% | 5% |
| 730 | 103% | 32% | 806 | 105% | 94% | 882 | 51% | 5% |
| 731 | 102% | 50% | 807 | 105% | 100% | 883 | 50% | 5% |
| 732 | 103% | 30% | 808 | 105% | 98% | 884 | 50% | 5% |
| 733 | 103% | 44% | 809 | 105% | 95% | 885 | 50% | 5% |
| 734 | 102% | 40% | 810 | 105% | 96% | 886 | 50% | 5% |
| 735 | 103% | 43% | 811 | 105% | 92% | 887 | 50% | 5% |
| 736 | 103% | 41% | 812 | 104% | 97% | 888 | 51% | 5% |
| 737 | 102% | 46% | 813 | 100% | 85% | 889 | 51% | 5% |
| 738 | 103% | 39% | 814 | 94% | 74% | 890 | 51% | 5% |
| 739 | 102% | 41% | 815 | 87% | 62% | 891 | 63% | 50% |
| 740 | 103% | 41% | 816 | 81% | 50% | 892 | 81% | 34% |
| 741 | 102% | 38% | 817 | 81% | 46% | 893 | 81% | 25% |
| 742 | 103% | 39% | 818 | 80% | 39% | 894 | 81% | 29% |
| 743 | 102% | 46% | 819 | 80% | 32% | 895 | 81% | 23% |
| 744 | 104% | 46% | 820 | 81% | 28% | 896 | 80% | 24% |
| 745 | 103% | 49% | 821 | 80% | 26% | 897 | 81% | 24% |

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| 898 | 81% | 28% | 974 | 81% | 23% | 1050 | 87% | 29% |
| 899 | 81% | 27% | 975 | 81% | 19% | 1051 | 82% | 49% |
| 900 | 81% | 22% | 976 | 81% | 25% | 1052 | 84% | 21% |
| 901 | 81% | 19% | 977 | 81% | 29% | 1053 | 82% | 56% |
| 902 | 81% | 17% | 978 | 83% | 47% | 1054 | 81% | 30% |
| 903 | 81% | 17% | 979 | 81% | 90% | 1055 | 85% | 21% |
| 904 | 81% | 17% | 980 | 81% | 75% | 1056 | 86% | 16% |
| 905 | 81% | 15% | 981 | 80% | 60% | 1057 | 79% | 52% |
| 906 | 80% | 15% | 982 | 81% | 48% | 1058 | 78% | 60% |
| 907 | 80% | 28% | 983 | 81% | 41% | 1059 | 74% | 55% |
| 908 | 81% | 22% | 984 | 81% | 30% | 1060 | 78% | 84% |
| 909 | 81% | 24% | 985 | 80% | 24% | 1061 | 80% | 54% |
| 910 | 81% | 19% | 986 | 81% | 20% | 1062 | 80% | 35% |
| 911 | 81% | 21% | 987 | 81% | 21% | 1063 | 82% | 24% |
| 912 | 81% | 20% | 988 | 81% | 29% | 1064 | 83% | 43% |
| 913 | 83% | 26% | 989 | 81% | 29% | 1065 | 79% | 49% |
| 914 | 80% | 63% | 990 | 81% | 27% | 1066 | 83% | 50% |
| 915 | 80% | 59% | 991 | 81% | 23% | 1067 | 86% | 12% |
| 916 | 83% | 100% | 992 | 81% | 25% | 1068 | 64% | 14% |
| 917 | 81% | 73% | 993 | 81% | 26% | 1069 | 24% | 14% |
| 918 | 83% | 53% | 994 | 81% | 22% | 1070 | 49% | 21% |
| 919 | 80% | 76% | 995 | 81% | 20% | 1071 | 77% | 48% |
| 920 | 81% | 61% | 996 | 81% | 17% | 1072 | 103% | 11% |
| 921 | 80% | 50% | 997 | 81% | 23% | 1073 | 98% | 48% |
| 922 | 81% | 37% | 998 | 83% | 65% | 1074 | 101% | 34% |
| 923 | 82% | 49% | 999 | 81% | 54% | 1075 | 99% | 39% |
| 924 | 83% | 37% | 1000 | 81% | 50% | 1076 | 103% | 11% |
| 925 | 83% | 25% | 1001 | 81% | 41% | 1077 | 103% | 19% |
| 926 | 83% | 17% | 1002 | 81% | 35% | 1078 | 103% | 7% |
| 927 | 83% | 13% | 1003 | 81% | 37% | 1079 | 103% | 13% |
| 928 | 83% | 10% | 1004 | 81% | 29% | 1080 | 103% | 10% |
| 929 | 83% | 8% | 1005 | 81% | 28% | 1081 | 102% | 13% |
| 930 | 83% | 7% | 1006 | 81% | 24% | 1082 | 101% | 29% |
| 931 | 83% | 7% | 1007 | 81% | 19% | 1083 | 102% | 25% |
| 932 | 83% | 6% | 1008 | 81% | 16% | 1084 | 102% | 20% |
| 933 | 83% | 6% | 1009 | 80% | 16% | 1085 | 96% | 60% |
| 934 | 83% | 6% | 1010 | 83% | 23% | 1086 | 99% | 38% |
| 935 | 71% | 5% | 1011 | 83% | 17% | 1087 | 102% | 24% |
| 936 | 49% | 24% | 1012 | 83% | 13% | 1088 | 100% | 31% |
| 937 | 69% | 64% | 1013 | 83% | 27% | 1089 | 100% | 28% |
| 938 | 81% | 50% | 1014 | 81% | 58% | 1090 | 98% | 3% |
| 939 | 81% | 43% | 1015 | 81% | 60% | 1091 | 102% | 26% |
| 940 | 81% | 42% | 1016 | 81% | 46% | 1092 | 95% | 64% |
| 941 | 81% | 31% | 1017 | 80% | 41% | 1093 | 102% | 23% |
| 942 | 81% | 30% | 1018 | 80% | 36% | 1094 | 102% | 25% |
| 943 | 81% | 35% | 1019 | 81% | 26% | 1095 | 98% | 42% |
| 944 | 81% | 28% | 1020 | 86% | 18% | 1096 | 93% | 68% |
| 945 | 81% | 27% | 1021 | 82% | 35% | 1097 | 101% | 25% |
| 946 | 80% | 27% | 1022 | 79% | 53% | 1098 | 95% | 64% |
| 947 | 81% | 31% | 1023 | 82% | 30% | 1099 | 101% | 35% |
| 948 | 81% | 41% | 1024 | 83% | 29% | 1100 | 94% | 59% |
| 949 | 81% | 41% | 1025 | 83% | 32% | 1101 | 97% | 37% |
| 950 | 81% | 37% | 1026 | 83% | 28% | 1102 | 97% | 60% |
| 951 | 81% | 43% | 1027 | 76% | 60% | 1103 | 93% | 98% |
| 952 | 81% | 34% | 1028 | 79% | 51% | 1104 | 98% | 53% |
| 953 | 81% | 31% | 1029 | 86% | 26% | 1105 | 103% | 13% |
| 954 | 81% | 26% | 1030 | 82% | 34% | 1106 | 103% | 11% |
| 955 | 81% | 23% | 1031 | 84% | 25% | 1107 | 103% | 11% |
| 956 | 81% | 27% | 1032 | 86% | 23% | 1108 | 103% | 13% |
| 957 | 81% | 38% | 1033 | 85% | 22% | 1109 | 103% | 10% |
| 958 | 81% | 40% | 1034 | 83% | 26% | 1110 | 103% | 10% |
| 959 | 81% | 39% | 1035 | 83% | 25% | 1111 | 103% | 11% |
| 960 | 81% | 27% | 1036 | 83% | 37% | 1112 | 103% | 10% |
| 961 | 81% | 33% | 1037 | 84% | 14% | 1113 | 103% | 10% |
| 962 | 80% | 28% | 1038 | 83% | 39% | 1114 | 102% | 18% |
| 963 | 81% | 34% | 1039 | 76% | 70% | 1115 | 102% | 31% |
| 964 | 83% | 72% | 1040 | 78% | 81% | 1116 | 101% | 24% |
| 965 | 81% | 49% | 1041 | 75% | 71% | 1117 | 102% | 19% |
| 966 | 81% | 51% | 1042 | 86% | 47% | 1118 | 103% | 10% |
| 967 | 80% | 55% | 1043 | 83% | 35% | 1119 | 102% | 12% |
| 968 | 81% | 48% | 1044 | 81% | 43% | 1120 | 99% | 56% |
| 969 | 81% | 36% | 1045 | 81% | 41% | 1121 | 96% | 59% |
| 970 | 81% | 39% | 1046 | 79% | 46% | 1122 | 74% | 28% |
| 971 | 81% | 38% | 1047 | 80% | 44% | 1123 | 66% | 62% |
| 972 | 80% | 41% | 1048 | 84% | 20% | 1124 | 74% | 29% |
| 973 | 81% | 30% | 1049 | 79% | 31% | 1125 | 64% | 74% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1126 | 69% | 40% | 1165 | 74% | 2% | 1203 | 69% | 46% |
| 1127 | 76% | 2% | 1166 | 75% | 21% | 1204 | 68% | 62% |
| 1128 | 72% | 29% | 1167 | 74% | 15% | 1205 | 68% | 62% |
| 1129 | 66% | 65% | 1168 | 75% | 13% | 1206 | 68% | 62% |
| 1130 | 54% | 69% | 1169 | 76% | 10% | 1207 | 68% | 62% |
| 1131 | 69% | 56% | 1170 | 75% | 13% | 1208 | 68% | 62% |
| 1132 | 69% | 40% | 1171 | 75% | 10% | 1209 | 68% | 62% |
| 1133 | 73% | 54% | 1172 | 75% | 7% | 1210 | 54% | 50% |
| 1134 | 63% | 92% | 1173 | 75% | 13% | 1211 | 41% | 37% |
| 1135 | 61% | 67% | 1174 | 76% | 8% | 1212 | 27% | 25% |
| 1136 | 72% | 42% | 1175 | 76% | 7% | 1213 | 14% | 12% |
| 1137 | 78% | 2% | 1176 | 67% | 45% | 1214 | 0% | 0% |
| 1138 | 76% | 34% | 1177 | 75% | 13% | 1215 | 0% | 0% |
| 1139 | 67% | 80% | 1178 | 75% | 12% | 1216 | 0% | 0% |
| 1140 | 70% | 67% | 1179 | 73% | 21% | 1217 | 0% | 0% |
| 1141 | 53% | 70% | 1180 | 68% | 46% | 1218 | 0% | 0% |
| 1142 | 72% | 65% | 1181 | 74% | 8% | 1219 | 0% | 0% |
| 1143 | 60% | 57% | 1182 | 76% | 11% | 1220 | 0% | 0% |
| 1144 | 74% | 29% | 1183 | 76% | 14% | 1221 | 0% | 0% |
| 1145 | 69% | 31% | 1184 | 74% | 11% | 1222 | 0% | 0% |
| 1146 | 76% | 1% | 1185 | 74% | 18% | 1223 | 0% | 0% |
| 1147 | 74% | 22% | 1186 | 73% | 22% | 1224 | 0% | 0% |
| 1148 | 72% | 52% | 1187 | 74% | 20% | 1225 | 0% | 0% |
| 1149 | 62% | 96% | 1188 | 74% | 19% | 1226 | 0% | 0% |
| 1150 | 54% | 72% | 1189 | 70% | 22% | 1227 | 0% | 0% |
| 1151 | 72% | 28% | 1190 | 71% | 23% | 1228 | 0% | 0% |
| 1152 | 72% | 35% | 1191 | 73% | 19% | 1229 | 0% | 0% |
| 1153 | 64% | 68% | 1192 | 73% | 19% | 1230 | 0% | 0% |
| 1154 | 74% | 27% | 1193 | 72% | 20% | 1231 | 0% | 0% |
| 1155 | 76% | 14% | 1194 | 64% | 60% | 1232 | 0% | 0% |
| 1156 | 69% | 38% | 1195 | 70% | 39% | 1233 | 0% | 0% |
| 1157 | 66% | 59% | 1196 | 66% | 56% | 1234 | 0% | 0% |
| 1158 | 64% | 99% | 1197 | 68% | 64% | 1235 | 0% | 0% |
| 1159 | 51% | 86% | 1198 | 30% | 68% | 1236 | 0% | 0% |
| 1160 | 70% | 53% | 1199 | 70% | 38% | 1237 | 0% | 0% |
| 1161 | 72% | 36% | 1200 | 66% | 47% | 1238 | 0% | 0% |
| 1162 | 71% | 47% | 1201 | 76% | 14% | | | |
| 1163 | 70% | 42% | 1202 | 74% | 18% | | | |
| 1164 | 67% | 34% | | | | | | |

**PART 1065—TEST PROCEDURES AND EQUIPMENT**

The authority for part 1065 continues to read as follows:
Authority: 42 U.S.C. 7401-7671(q).

**Subpart A—[Amended]**

**§1065.1 Applicability.**

(a) This part describes the procedures that apply to testing that we require for the following engines or for equipment using the following engines:

(1) Large nonroad spark-ignition engines we regulate under 40 CFR part 1048.

(2) Vehicles that we regulate under 40 CFR part 1051 (i.e., recreational SI vehicles) that are regulated based on engine testing. See 40 CFR part 1051 to determine which vehicles may be certified based on engine test data.

(3) Land-based nonroad compression-ignition engines we regulate under 40 CFR part 1039.

(b) This part does not apply to any of the following engine or vehicle categories:

(1) Light-duty highway vehicles (see 40 CFR part 86).

(2) Heavy-duty highway Otto-cycle engines (see 40 CFR part 86).

(3) Heavy-duty highway diesel engines (see 40 CFR part 86).

(4) Aircraft engines (see 40 CFR part 87).

(5) Locomotive engines (see 40 CFR part 92).

~~(6) Land-based nonroad diesel engines (see 40 CFR part 89).~~[Reserved]

(7) General marine engines (see 40 CFR parts 89 and 94)

(8) Marine outboard and personal watercraft engines (see 40 CFR part 91).

(9) Small nonroad spark-ignition engines (see 40 CFR part 90).

(c) This part is addressed to you as a manufacturer, but it applies equally to anyone who does testing for you, and to us when we conduct testing to determine if you meet emission standards.

(d) Paragraph (a) of this section identifies the parts of the CFR that define emission standards and other requirements for particular types of engines. In this part 1065, we refer to each these other parts generically as the "standard-setting part." For example, 40 CFR part 1051 is always the standard-setting part for snowmobiles. Follow the standard-setting part if it differs from this part.

(e) For equipment subject to this part and regulated under equipment-based or vehicle-based standards, interpret the term "engine" in this part to include equipment and vehicles(see 40 CFR 1068.30).

**Subpart B—[Amended]**

Section 1065.115 is amended to read as follows:

**§ 1065.115 Exhaust gas sampling system; compression ignition engines.**

Use the exhaust-gas sampling system specified in 40 CFR 86.1310 to measure emissions from compression-ignition nonroad engines.

**Subpart C—[Amended]**

**§1065.205 Test fuel specifications for distillate diesel fuel.**

For all emission tests, use test fuels meeting the specifications for diesel fuel in 40 CFR part 86 subpart N.

**Subpart H—[Amended]**

Section 1065.701 is added to read as follows:

**§ 1065.701 Particulate measurements.**

Use the particulate sampling system and procedures specified in 40 CFR part 86 subpart N to measure particulate emissions from compression-ignition nonroad engines.

**PART 1068— GENERAL COMPLIANCE PROVISIONS FOR NONROAD PROGRAMS**

#. The authority for part 1065 continues to read as follows:
Authority: 42 U.S.C. 7401 - 7671(q).

**Subpart A—Applicability and Miscellaneous Provisions**

**§1068.1 Does this part apply to me?**

(a) The provisions of this part apply to everyone with respect to the following engines or to equipment using the following engines (including owners, operators, parts manufacturers, and persons performing maintenance):

(1) Large nonroad spark-ignition engines we regulate under 40 CFR part 1048.

(2) Recreational SI engines and vehicles that we regulate under 40 CFR part 1051 (such as snowmobiles and off-highway motorcycles).

(3) Land-based nonroad diesel engines that we regulate under 40 CFR part 1039.

(b) This part does not apply to any of the following engine or vehicle categories:

(1) Light-duty motor vehicles (see 40 CFR part 86).

(2) Heavy-duty motor vehicles and motor vehicle engines (see 40 CFR part 86).

(3) Aircraft engines (see 40 CFR part 87).

(4) Locomotive engines (see 40 CFR part 92).

(5) ~~Land-based nonroad diesel engines (see 40 CFR part 89).~~[Reserved]

(6) Marine diesel engines (see 40 CFR parts 89 and 94)

(7) Marine outboard and personal watercraft engines (see 40 CFR part 91).

(8) Small nonroad spark-ignition engines (see 40 CFR part 90).

* * * * *

**§1068.30 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 the Act gives to them. The definitions follow:

Act means the Clean Air Act, as amended, 42 U.S.C. 7401 et seq.

Aftertreatment means relating to any system, component, or technology mounted downstream of the exhaust valve or exhaust port whose design function is to reduce exhaust emissions.

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**§1068.105 What other provisions apply to me specifically if I manufacture equipment needing certified engines?**

This section describes general provisions that apply to equipment manufacturers. See the standard-setting part for any requirements that apply for certain applications.

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**§1068.210 What are the provisions for exempting test engines?**

(a) We may exempt engines that are not exempted under other sections of this part that you will use for research, investigations, studies, demonstrations, or training. This may include engines placed into service if the primary purpose is to develop a fundamentally new emission-control technology related either to an alternative fuel or an aftertreatment device.

* * * * *

**§1068.215 What are the provisions for exempting manufacturer-owned engines?**

(a) You are eligible for the exemption for manufacturer-owned engines only if you are a certificate holder.

(b) An engine may be exempt without a request if it is a nonconforming engine under your ownership and control and you operate it to develop products, assess production methods, or promote your engines in the marketplace. You may not lease, sell, or use the engine to generate revenue, either by itself or in a piece of equipment.

(c) To use this exemption, you must do three things:

(1) Establish, maintain, and keep adequately organized and indexed information on each exempted engine, including the engine identification number, the use of the engine on exempt status, and the final disposition of any engine removed from exempt status.

(2) Let us access these records, as described in §1068.20.

(3) Add a permanent, legible label, written in block letters in English, to a readily visible part of each exempted engine. This label must include at least the following items:

(i) The label heading "EMISSION CONTROL INFORMATION".

(ii) Your corporate name and trademark.

(iii) Engine displacement, engine family identification (as applicable), and model year of the engine or whom to contact for further information.

(iv) The statement “THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.215 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.”.

**§1068.220 What are the provisions for exempting display engines?**

(a) Anyone may request an exemption for display engines.

(b) A nonconforming display engine will be exempted if it is used only for displays in the interest of a business or the general public. This exemption does not apply to engines displayed for private use or any other purpose we determine is inappropriate for a display exemption.

(c) You may operate the exempted engine, but only if we approve specific operation that is part of the display.

(d) You may sell or lease the exempted engine only with our advance approval; you may not use it to generate revenue.

(e) To use this exemption, you must add a permanent, legible label, written in block letters in English, to a readily visible part of each exempted engine. This label must include at least the following items:

(1) The label heading "EMISSION CONTROL INFORMATION".

(2) Your corporate name and trademark.

(3) Engine displacement, engine family identification (as applicable), and model year of the engine or whom to contact for further information.

(4) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.220 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.".

(f) We may set other conditions for approval of this exemption.

**§1068.315 What are the permanent exemptions for imported engines?**

We may approve a permanent exemption for an imported engine under the following conditions:

(a) National security exemption. You may an import engine under the national security exemption in §1068.225.

(b) Manufacturer-owned engine exemption. You may import a manufacturer-owned engine, as described in §1068.215.

(c) Replacement engine exemption. You may import a nonconforming replacement engine as described in §1068.240. To use this exemption, you must be a certificate holder for an engine family we regulate under the same part as the replacement engine.

(d) Extraordinary circumstances exemption. You may import a nonconforming engine if we grant hardship relief as described in §1068.245.

(e) Hardship exemption. You may import a nonconforming engine if we grant an exemption for the transition to new or revised emission standards, as described in §1068.255.

(f) Identical configuration exemption. You may import a nonconforming engine if it is identical to certified engines produced by the same manufacturer, subject to the following provisions:

(1) You may import only the following engines under this exemption:

(i) Large nonroad spark-ignition engines (see part 1048 of this chapter).

(ii) Recreational nonroad spark-ignition engines and equipment (see part 1051 of this chapter).

(iii) Land-based nonroad diesel engines (see part 1039 of this chapter).

(2) You must meet all the following criteria:

(i) You have owned the engine for at least one year.

(ii) You agree not to sell, lease, donate, trade, or otherwise transfer ownership of the engine for at least five years, or until the engine is eligible for the exemption in paragraph (g) of this section. During this period, the only acceptable way to dispose of the engine is to destroy or export it.

(iii) You use data or evidence sufficient to show that the engine is in a configuration that is the same as an engine the original manufacturer has certified to meet emission standards that apply at the time the manufacturer finished assembling or modifying the engine in question. If you modify the engine to make it identical, you must follow the original manufacturer's complete written instructions.

(3) We will tell you in writing if we find the information insufficient to show that the engine is eligible for this exemption. In this case, we will not consider your request further until you address our concerns.

(g) Ancient engine exemption. If you are not the original engine manufacturer, you may import a nonconforming engine that is subject to a standard-setting part and was first manufactured at least 21 years earlier, as long as it is still in its original configuration

**§1068.340 What special provisions apply to Independent Commercial Importers?**

We generally consider engines to be new when they are imported into the United States, even if they have previously been placed into service outside the country. See 40 CFR part 89, subpart G, for special provisions allowing Independent Commercial Importers to show that such engines meet the requirements of the standard-setting part

without the full certification process.