

APPENDIX B

PROPOSED REGULATION ORDER

Tier 4 Off-Road Compression-Ignition Engines

Title 13 California Code of Regulations

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Proposed Regulation Order

Note: This document is printed in a style to indicate changes from the existing provisions. All existing language is indicated by plain type. All additions to language are indicated by underlined text. All deletions to language are indicated by ~~strikeout~~. Only those portions containing the suggested modifications from the existing provisions are included. All other portions remain unchanged and are indicated by the symbol “* * * * *” for reference.

Amend Article 4, Chapter 9, Division 3, Title 13, California Code of Regulations (CCR), to read as follows:

Chapter 9. Off-Road Vehicles and Engines Pollution Control Devices

Article 4. Off-Road Compression-Ignition Engines and Equipment

§ 2420. Applicability.

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§ 2421. Definitions.

(a) The definitions in Section 1900(b), Chapter 3, Title 13 of the California Code of Regulations, shall apply with the following additions:

(1) "1996-1999 Heavy-Duty Test Procedures" means the document entitled "California Exhaust Emission Standards and Test Procedures for New 1996-1999 Heavy-Duty Off-Road Compression-Ignition Engines, Part I-A," which includes the standards and test procedures applicable to 1996-1999 heavy-duty off-road compression-ignition engines, as adopted May 12, 1993, and as amended January 28, 2000. This document is incorporated by reference herein.

(2) "1996-1999 Smoke Test Procedures" means the document entitled "California Smoke Test Procedures for New 1996-1999 Off-Road Compression-Ignition Engines, Part III," which includes the standards and test procedures applicable to 1996-1999 heavy-duty off-road compression-ignition engines, as adopted May 12, 1993, and as amended January 28, 2000. This document is incorporated by reference herein.

(3) "2000 Plus Limited Test Procedures" means the document titled "California Exhaust Emission Standards and Test Procedures for New 2000 and Later Tier 1, Tier 2, and Tier 3 Off-Road Compression-Ignition Engines, Part I-B," which includes the standards and test procedures applicable to 2000 and later model year off-road compression-ignition engines, as adopted January 28, 2000, and as amended October 20, 2005. This document is incorporated by reference herein.

(4)(A) "~~2008-2010 and Later~~ Test Procedures" means the document titled "California Exhaust Emission Standards and Test Procedures for New 2008-~~2010 and Later~~ Tier 4 Off-Road Compression-Ignition Engines," which includes the standards and test procedures applicable to 2008-~~2010 and later~~ model year off-road compression-ignition engines, as adopted October 20, 2005, and as amended (insert date of adoption). This document is incorporated by reference herein.

(B) "2011 and Later Test Procedures" means the collection of documents titled "California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression-Ignition Engines, Parts I-D, I-E, and I-F," which include, respectively, the emission standards, general compliance provisions, and engine testing procedures applicable to 2011 model year and later off-road compression engines, as adopted (insert date of adoption). These documents are incorporated by reference herein.

(5) "Adjustable parameter" means any device, system, or element of design that is capable of being adjusted manually (even if difficult to access), and which may affect emissions or engine performance during emission testing or normal in-use operation. This includes, but is not limited to, parameters related to injection timing and fueling rate. A parameter that is difficult to access may be excluded upon request to the

Executive Officer if the parameter cannot be adjusted to a degree that affects emissions without significantly degrading engine performance, or if demonstrated that it will not be adjusted in a way that affects emissions during in-use operation.

(6) "Alternate fuel" means any fuel that will reduce non-methane hydrocarbons (on a reactivity-adjusted basis), NO_x, CO, and the potential risk associated with toxic air contaminants as compared to gasoline or diesel fuel and would not result in increased deterioration of the engine. Alternate fuels include, but are not limited to, methanol, ethanol, liquefied petroleum gas, compressed natural gas, and electricity.

(7) "ARB Enforcement Officer" means any officer or employee of the Air Resources Board so designated in writing by the Executive Officer (or by his designee).

(8) "Assembly-line tests" are those tests or inspections that are performed on or at the end of the assembly line.

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

(10) "Blue Sky Series engine" means an off-road compression-ignition engine meeting the requirements of Section 2423(b)(4).

(11) "Calendar year" is defined as the twelve-month period commencing on January 1 through December 31.

(12) "Certification" means, with respect to new off-road compression-ignition engines, the obtaining of an Executive Order for an engine family complying with the off-road compression-ignition engine emission standards and requirements specified in this article.

(13) "Certified configuration" or "certified emissions configuration" means the assembled state of an engine that is equipped with a complete set of emission-related components and systems that are equivalent from an emissions standpoint (i.e., tolerances, calibrations, and specifications) to those components and systems that (A) were originally installed on the engine when it was issued an Executive Order, (B) have been approved by the engine manufacturer to supersede any of the original emission-related components and systems for that engine, or (C) are direct replacement parts equaling or exceeding the emissions-related performance of the original or superseded components and systems.

(14) "Compression-ignition engine" means a type of engine with operating characteristics significantly similar to the theoretical Diesel combustion cycle. The non-use of a throttle to regulate intake flow for controlling power during normal operation is indicative of a compression-ignition engine. A compression-ignition engine

may be petroleum-fueled (i.e., diesel-fueled) or alternate-fueled. All engines and equipment that fall within the scope of the preemption of Section 209(e)(1) of the Federal Clean Air Act (42 U.S.C. 7543(e)(1)) and as defined by regulation of the Environmental Protection Agency, are specifically not included within this category.

(15) "Constant-speed engine" means

(A) for engines subject to the 2000 and Later Plus Limited Test Procedures, an off-road compression-ignition engine that is governed to operate only at rated speed, or

(B) for engines subject to the 2008-~~2010 and Later~~ Test Procedures, an off-road compression-ignition engine certified to operate only at constant speed, where ~~C~~constant-speed operation means engine operation with a governor that controls the operator input to maintain an engine at a reference speed, even under changing load. For example, an isochronous governor changes reference speed temporarily during a load change, then returns the engine to its original reference speed after the engine stabilizes. Isochronous governors typically allow speed changes up to 1.0 %. Another example is a speed-droop governor, which has a fixed reference speed at zero load and allows the reference speed to decrease as load increases. With speed-droop governors, speed typically decreases (3 to 10) % below the reference speed at zero load, such that the minimum reference speed occurs near the engine's point of maximum power, or

(C) for engines subject to the 2011 and Later Test Procedures, and off-road compression-ignition engine certified to operate only at constant speed, where constant-speed operation means engine operation with a governor that automatically controls the operator demand to maintain engine speed, even under changing load. Governors do not always maintain speed exactly constant. Typically speed can decrease (0.1 to 10) % below the speed at zero load, such that the minimum speed occurs near the engine's point of maximum power.

(16) "Crankcase emissions" means airborne substances emitted into the atmosphere from any portion of the engine crankcase ventilation or lubrication system.

(17) "Compliance testing" means ARB directed emissions tests and inspections of a reasonable number of production engines and/or vehicles that are offered for sale, or manufactured for sale, in California in order to verify compliance with the applicable certification emission standards. The emissions tests may be conducted at ARB or contracted out facilities or at the manufacturer's facility. The testing will be done at the expense of the manufacturer.

(18) "Confirmatory testing" means ARB directed emissions tests and inspections of the test engines and/or test vehicles used by the manufacturer to obtain test data for submittal with the certification application. The emissions tests may be conducted at

ARB or contracted out facilities or at the manufacturer's facility. The testing will be done at the expense of the manufacturer.

(19) "Date of manufacture" or "Build date" means one of the following:

(A) For engines, the date on which the crankshaft is installed in an engine block, with the following exceptions:

1. Reserved.

2. Manufacturers may assign a date of manufacture at a point in the assembly process later than the date otherwise specified under this definition. For example, a manufacturer may use the build date printed on the label or stamped on the engine as the date of manufacture.

(B) For equipment, the date on which the engine is installed, unless otherwise specified in this Article 4. Manufacturers may alternatively assign a date of manufacture later in the assembly process.

~~(1920)~~ "Dealer" means that person or entity engaged in the selling of new off-road compression-ignition engines, vehicles or equipment to ultimate purchasers.

~~(2021)~~ "Deterioration factor" means the relationship between emissions at the end of useful life and emissions at the low-hour test point, expressed in one of the following ways, whichever is applicable: (A) For multiplicative deterioration factors, the ratio of emissions at the end of useful life to emissions at the low-hour test point; (B) For additive deterioration factors, the difference between emissions at the end of useful life and emissions at the low-hour test point.

~~(2122)~~ "Diesel cycle engine" means a type of engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. The primary means of controlling power output in a diesel cycle engine is by limiting the amount of fuel that is injected into the combustion chambers of the engine. A diesel cycle engine may be petroleum-fueled (i.e., diesel-fueled) or alternate-fueled.

~~(2223)~~ "Emission control system" includes any component, group of components, or engine modification that controls or causes the reduction of substances emitted from an engine.

~~(2324)~~ "End of assembly line" is defined as that place where the final inspection test or quality-audit test is performed.

~~(2425)~~ "Engine manufacturer" or "manufacturer" means any person who is engaged in the manufacturing or assembling of new off-road engines or the importing of new off-road engines for resale and who has been granted certification, or any person

who acts for and is under the control of a manufacturer in connection with the distribution of new off-road engines. "Engine manufacturer" or "manufacturer" does not include a dealer who receives new off-road engines for sale in commerce.

(~~2526~~) "Exhaust emissions" means substances emitted into the atmosphere from any opening downstream from the exhaust port of an off-highway engine.

(~~2627~~) "Family emission limit" (FEL) means an emission level that is declared by the manufacturer to serve in lieu of an emission standard for certification purposes and for the averaging, banking, and trading program, as defined in Title 13, California Code of Regulations, Section 2423. A FEL must be expressed to the same number of decimal places as the applicable emission standard.

(~~2728~~) "Final calendar quarter production" is defined as the calendar quarter in which the production of an engine family ends.

(~~2829~~) "First calendar quarter production" is defined as the calendar quarter in which the production of an engine family begins.

(~~2930~~) "Fuel system" means the combination of any of the following components: fuel tank, fuel pump, fuel lines, oil injection metering system, carburetor or fuel injection components, or all fuel system vents.

(~~3031~~) "Gross engine malfunction" is defined as one yielding an emission value greater than the sum of the mean plus three (3) times the standard deviation. This definition shall apply only for determination of control limits.

(~~3132~~) "Heavy-duty off-road compression-ignition engines" or "engines" are identified as: 1996 through 1999 model year diesel or alternate fuel powered diesel cycle internal combustion engines 175 horsepower and greater, operated on or in any device by which any person or property may be propelled, moved or drawn upon a highway, but are primarily used off a highway. The engines are designed for powering construction, farm, mining, forestry and industrial implements and equipment. They are designed to be used in, but are not limited to use in, the following applications: agricultural tractors, backhoes, excavators, dozers, log skidders, trenchers, motor graders, portable generators and compressors and other miscellaneous applications.

Specifically excluded from this category are: (A) engines operated on or in any device used exclusively upon stationary rails or tracks; (B) marine diesel engines; (C) internal combustion engines attached to a foundation at a location; (D) transportable engines subject to District permitting rules which have been operated at a location for a period of one year or more on January 1, 1997; and (E) stationary or transportable gas turbines for power generation.

(~~3233~~) "Identification number" means a specification (for example, model, number/serial number combination) that allows a particular off-road compression-ignition to be distinguished from other similar engines.

(~~3334~~) "Marine diesel engine" means a compression-ignition engine that is installed or intended to be installed on a vessel. There are two types of Marine Diesel Engines: (A) Propulsion marine compression-ignition engines, which are those that move or are intended to move a vessel through water or direct the movement of a vessel, and (B) Auxiliary marine diesel engines, which are integral to the vessel, but which do not propel the vessel. This definition includes portable auxiliary marine engines or generators only if their fueling, cooling, or exhaust systems are an integral part of the vessel.

(~~3435~~) "Maximum Engine Power" means the maximum brake power point on the nominal power curve for a specific engine configuration, rounded to the nearest whole kilowatt. The "nominal power curve" of an engine configuration means the relationship between maximum available engine brake power and engine speed for a specific engine configuration, as determined using the mapping procedures specified in Part 1065 of the 2008-~~2010 and Later Test Procedures~~ or Part I-F of the 2011 and Later Test Procedures as applicable, based on the manufacturer's design and production specifications for that engine. This relationship may also be expressed by a torque curve that relates maximum available engine torque with engine speed. The nominal power curve shall be within the normal production variability of actual power curves for production engines of the same engine configuration. This definition of Maximum Engine Power shall be applicable for all references to a specific power value or range of power values with respect to engines subject to the 2008-~~2010 or 2011~~ and Later Test Procedures as applicable, except as otherwise noted or permitted by the Executive Officer. Maximum Engine Power shall be used as the basis for categorizing engine families into appropriate Tier 4 power categories.

(~~3536~~) "Maximum Rated Power" means the maximum brake kilowatt output of an engine at rated speed as stated by the manufacturer in the manufacturer's sales and service literature and in the application for certification. Maximum Rated Power shall be used as the basis for categorizing engine families into appropriate Tier 1, Tier 2, and Tier 3 power categories, except as otherwise noted or permitted by the Executive Officer.

(~~3637~~) "Maximum Test Speed" has the same meaning as defined in Part 1065.1001 of the 2008-~~2010 and 2011~~ and Later Test Procedures.

(~~3738~~) "Model year" means the manufacturer's annual production period which includes January 1 of a calendar year or, if the manufacturer has no annual production period, the calendar year. Other examples for the determination of model year are identified in §1039.801 of the 2008-2010 and the 2011 and Later Test Procedures as applicable.

(3839) "Off-road compression-ignition engine":

(A) Except as specified in paragraph (B) of this definition, an off-road compression-ignition engine is any internal combustion engine:

1. in or on a piece of equipment that is self-propelled or serves as a dual purpose by both propelling itself and performing another function and is primarily used off the highways (such as garden tractors, off-highway mobile cranes and bulldozers); or
2. in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or
3. that, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to wheels, skids, carrying handles, dolly, trailer, or platform.

(B) An internal combustion engine is not an off-road compression-ignition engine if:

1. the engine is used to propel a vehicle subject to the emission standards contained in Title 13, California Code of Regulations, Sections 1950 - 1978, or a vehicle used solely for competition, or is subject to standards promulgated under Section 202 of the federal Clean Air Act (42 U.S.C. 7521); or
2. the engine is regulated by a federal New Source Performance Standard promulgated under Section 111 of the federal Clean Air Act (42 U.S.C. 7511); or
3. the engine otherwise included in paragraph (A)(3.) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two years) and that operates at a single location approximately three months (or more) each year. This paragraph does not apply to an engine after the engine is removed from the location.

(3940) “Off-road vehicle” or “Off-road equipment” means a vehicle or equipment that is powered by an off-road compression-ignition engine.

(4041) “Off-road vehicle manufacturer” or “Off-road equipment manufacturer” means any person engaging in the manufacturing or assembling of new off-road vehicles or equipment, or importing of new off-road vehicles or equipment for resale, or acting for and under the control of any person in connection with distributing new off-road vehicles and equipment. An off-road vehicle manufacturer or off-road equipment manufacturer does not include a dealer, nor any person engaging in the manufacturing or assembling of new off-road engines or equipment who does not install an engine as part of that manufacturing or assembling process. All off-road vehicle or equipment manufacturing entities that are under the control of the same person are considered to be a single off-road vehicle manufacturer or off-road equipment manufacturer.

(4142) “Opacity” means the fraction of a beam of light, expressed in percent, which fails to penetrate a plume of smoke.

(4243) “Otto cycle engine” means a type of engine with operating characteristics significantly similar to the theoretical Otto combustion cycle. The primary means of controlling power output in an Otto cycle engine is by limiting the amount of air and fuel that can enter the combustion chambers of the engine. Gasoline-fueled engines are Otto cycle engines.

(4344) “PM and Test Cycle Limited Procedures” means the document titled “California Exhaust Emission Standards and Test Procedures for New 1996 and Later Tier 1, Tier 2, and Tier 3 Off-Road Compression-Ignition Engines, Part II,” which includes the standards and test procedures applicable for 1996 and later heavy-duty off-road compression-ignition engines, as adopted May 12, 1993, and as amended October 20, 2005. This document is incorporated by reference herein.

(4445) “Post-manufacture marinizer” means a person who produces a marine compression-ignition engine by substantially modifying a certified or uncertified complete or partially complete engine, and is not controlled by the manufacturer of the base engine or by an entity that also controls the manufacturer of the base engine. For the purpose of this definition, “substantially modify” means changing an engine in a way that could change engine emission characteristics.

(4546) “Power category” means a specific range of maximum power that defines the applicability of standards. For example, references to the 56-130 kW power category and $56 \leq \text{kW} < 130$ include all engines with maximum power at or above 56 kW but below 130 kW. Also references to 56-560 kW power categories or $56 \leq \text{kW} \leq 560$ include all engines with maximum power at or above 56 kW, but at or below 560 kW, even though these engines span multiple power categories. Note that in

some cases, FEL caps are based on a subset of a power category. The Tier 4 applicable power categories are defined as follows:

- (A) Engines with maximum engine power below 19 kW.
- (B) Engines with maximum engine power at or above 19 kW but below 56 kW.
- (C) Engines with maximum engine power at or above 56 kW but below 130 kW.
- (D) Engines with maximum engine power at or above 130 kW but at or below 560 kW.
- (E) Engines with maximum engine power above 560 kW.

| **(4647)** “Propulsion marine compression-ignition engine” means a marine compression-ignition engine that is intended to move a vessel through water or direct the movement of a vessel.

| **(4748)** “Quality-audit test” is defined as the test performed on a sample of production engines produced for sale in California.

| **(4849)** “Rated speed” is the maximum full load governed speed for governed engines and the speed of maximum horsepower for ungoverned engines.

| **(4950)** “Representative engine sample” means that the sample is typical of the engine family or engine family group as a whole (as defined in applicable test procedures). Except as provided in Section 2427, a representative sample would not include a low-volume subgroup of the engine family or engine family group.

| **(5051)** “Scheduled maintenance” means any adjustment, repair, removal, disassembly, cleaning, or replacement of components or systems required by the manufacturer that is performed on a periodic basis to prevent part failure or equipment or engine malfunction, or anticipated as necessary to correct an overt indication of malfunction or failure for which periodic maintenance is not appropriate.

| **(5152)** “Small off-road engine” has the meaning specified in Title 13, California Code of Regulations, Section 2401.

| **(5253)** “Small-volume engine manufacturer” means a small business engine manufacturer that had engine families certified to meet the requirements of 40 CFR part 89 before 2003, had annual U.S.-directed production of no more than 2,500 units in 2002 and all earlier calendar years, and has 1000 or fewer employees. For manufacturers owned by a parent company, the production limit applies to the production of the parent company and all its subsidiaries and the employee limit applies to the total number of employees of the parent company and all its subsidiaries.

| **(5354)** “Tier 1 engine” means an engine subject to the Tier 1 emission standards listed in Section 2423(b)(1)(A) of this article.

(5455) "Tier 2 engine" means an engine subject to the Tier 2 emission standards listed in Section 2423(b)(1)(A) of this article.

(5556) "Tier 3 engine" means an engine subject to the Tier 3 emission standards listed in Section 2423(b)(1)(A) of this article.

(5657) "Tier 4 engine" means an engine subject to the Tier 4 emission standards listed in Section 2423(b)(1)(B) of this article.

(5758) "Ultimate purchaser" means the first person who in good faith purchases a new engine or equipment for purposes other than resale.

(5859) "Unscheduled maintenance" means any inspection, adjustment, repair, removal, disassembly, cleaning, or replacement of components or systems that is performed to correct or diagnose a part failure which was not anticipated.

(5960) "Useful life" means:

- (A) For all engines rated under 19 kilowatts, and for constant-speed engines rated under 37 kilowatts with rated speeds greater than or equal to 3,000 revolutions per minute, a period of use of five years or 3,000 hours of operation, whichever first occurs.
- (B) For all other engines rated at or above 19 kilowatts and under 37 kilowatts, a period of use of seven years or 5,000 hours of operation, whichever first occurs.
- (C) For all engines rated at or above 37 kilowatts, a period of use of ten years or 8,000 hours, whichever first occurs.

(6061) "Vessel" has the meaning specified in Section 9840 of the California Vehicle Code.

(6162) "Warrantable condition" means any condition of an engine that triggers the responsibility of the manufacturer to take corrective action pursuant to Section 2425.

(6263) "Warranted part" means any emissions-related part installed on an engine by the equipment manufacturer, or installed in a warranty repair, which is listed on the warranty parts list.

(6364) "Warranty period" means the period of time, either in years or hours of operation, that the engine or part is covered by the warranty provisions.

(6465) "Warranty station" means a service facility authorized by the equipment or engine manufacturer to perform warranty repairs. This shall include all manufacturer distribution centers that are franchised to service the subject equipment or engines.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code. Reference: Sections 43013, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

§ 2423. Exhaust Emission Standards and Test Procedures – Off-Road Compression-Ignition Engines.

(a) This section shall be applicable to new heavy-duty off-road compression-ignition engines, produced on or after January 1, 1996, and all other new 2000 and later model year off-road compression-ignition engines. For the purposes of this section, these engines shall be called “compression-ignition engines.”

(b)(1)(A) Exhaust emissions from new off-road compression-ignition engines, as sold in this state and as appropriate based on model year and maximum rated power, shall not exceed the levels contained in Table 1a with respect to steady-state testing. Table 1a follows:

Table 1a. – Tier 1, Tier 2, and Tier 3 Exhaust Emission Standards
(grams per kilowatt-hour)

| Maximum Rated Power (kW) ¹ | Tier | Model Year | NO _x ² | HC ³ | NMHC+NO _x ⁴ | CO ⁵ | PM ⁶ |
|---------------------------------------|---------------------|------------------------|------------------------------|-----------------|-----------------------------------|-----------------|-----------------|
| kW<8 | Tier 1 | 2000-2004 | — | — | 10.5 | 8.0 | 1.0 |
| | Tier 2 | 2005-2007 ⁷ | — | — | 7.5 | 8.0 | 0.80 |
| 8≤kW<19 | Tier 1 | 2000-2004 | — | — | 9.5 | 6.6 | 0.80 |
| | Tier 2 | 2005-2007 ⁷ | — | — | 7.5 | 6.6 | 0.80 |
| 19≤kW<37 | Tier 1 | 2000-2003 | — | — | 9.5 | 5.5 | 0.80 |
| | Tier 2 | 2004-2007 ⁷ | — | — | 7.5 | 5.5 | 0.60 |
| 37≤kW<56 | Tier 1 | 2000-2003 | 9.2 | — | — | — | — |
| | Tier 2 | 2004-2007 | — | — | 7.5 | 5.0 | 0.40 |
| | Tier 3 ⁸ | 2008-2011 | — | — | 4.7 | 5.0 | 0.40 |
| 56≤kW<75 | Tier 1 | 2000-2003 | 9.2 | — | — | — | — |
| | Tier 2 | 2004-2007 | — | — | 7.5 | 5.0 | 0.40 |
| | Tier 3 | 2008-2011 | — | — | 4.7 | 5.0 | 0.40 |
| 75≤kW<130 | Tier 1 | 2000-2002 | 9.2 | — | — | — | — |
| | Tier 2 | 2003-2006 | — | — | 6.6 | 5.0 | 0.30 |
| | Tier 3 | 2007-2011 | — | — | 4.0 | 5.0 | 0.30 |
| 130≤kW<225 | Tier 1 | 1996-2002 | 9.2 | 1.3 | — | 11.4 | 0.54 |
| | Tier 2 | 2003-2005 | — | — | 6.6 | 3.5 | 0.20 |
| | Tier 3 | 2006-2010 | — | — | 4.0 | 3.5 | 0.20 |
| 225≤kW<450 | Tier 1 | 1996-2000 | 9.2 | 1.3 | — | 11.4 | 0.54 |
| | Tier 2 | 2001-2005 | — | — | 6.4 | 3.5 | 0.20 |
| | Tier 3 | 2006-2010 | — | — | 4.0 | 3.5 | 0.20 |
| 450≤kW≤560 | Tier 1 | 1996-2001 | 9.2 | 1.3 | — | 11.4 | 0.54 |
| | Tier 2 | 2002-2005 | — | — | 6.4 | 3.5 | 0.20 |
| | Tier 3 | 2006-2010 | — | — | 4.0 | 3.5 | 0.20 |
| kW>560 | Tier 1 | 2000-2005 | 9.2 | 1.3 | — | 11.4 | 0.54 |
| | Tier 2 | 2006-2010 | — | — | 6.4 | 3.5 | 0.20 |

1. kW means kilowatts.
2. NO_x means Oxides of Nitrogen.
3. HC means Hydrocarbons.
4. NMHC+NO_x means Non-Methane Hydrocarbons plus Oxides of Nitrogen.
5. CO means Carbon Monoxide.
6. PM means Particulate Matter.
7. Tier 2 standards for propulsion marine compression-ignition engines below 37 kW remain in effect beyond the 2007 end date.
8. Manufacturers may optionally certify engine families to the interim Tier 4 standards in Table 1b for this power category through 2012.

(B) Exhaust emissions from new off-road compression-ignition engines, as sold in this state and as appropriate based on model year and maximum engine power, shall not exceed the levels contained in Table 1b, with respect to steady-state testing, transient testing, and, after application of the criteria in Table 1c, not-to-exceed testing,

as applicable. Other compliance options are ~~permissible as~~ provided in the 2008-2010
or 2011 and Later Test Procedures as applicable.

Table 1b. – Tier 4 Exhaust Emission Standards
(grams per kilowatt-hour)

| MAXIMUM ENGINE POWER | MODEL YEAR | TYPE | PM | NMHC+ | NMHC | NOX | CO |
|---------------------------------|------------------------|-------------------------------------|-------------------------|------------------------|----------|------------------|-----|
| | | | grams per kilowatt-hour | | | | |
| kW<8 ¹ | 2008 and later | FINAL | 0.40 ² | 7.5 | - | - | 8.0 |
| 8≤kW<19 ¹ | | | | | | | 6.6 |
| 19≤kW<37 ¹ | 2008-2012 | INTERIM | 0.30 | 7.5 | - | - | 5.5 |
| | 2013 and later | FINAL | 0.03 | 4.7 | | | |
| 37≤kW<56 ³ | 2008-2012 | INTERIM | 0.30 | 4.7 | - | - | 5.0 |
| | 2013 and later | FINAL | 0.03 | | | | |
| 56≤kW<75 | 2012-2014 ⁴ | PHASE-IN | 0.02 | - | 0.19 | 0.40 | 5.0 |
| | | PHASE-OUT | | 4.7 | - | - | |
| | | or/ ALT NOX | | - | 0.19 | 3.4 ⁵ | |
| | | <u>or/ ALT NOX+NMHC⁸</u> | | <u>3.5⁵</u> | <u>-</u> | <u>-</u> | |
| 2015 and later | FINAL | - | 0.19 | 0.40 | | | |
| 75≤kW<130 | 2012-2014 ⁴ | PHASE-IN | 0.02 | - | 0.19 | 0.40 | 5.0 |
| | | PHASE-OUT | | 4.0 | - | - | |
| | | or/ ALT NOX | | - | 0.19 | 3.4 ⁵ | |
| | | <u>or/ ALT NOX+NMHC⁸</u> | | <u>3.5⁵</u> | <u>-</u> | <u>-</u> | |
| 2015 and later | FINAL | - | 0.19 | 0.40 | | | |
| 130≤kW≤560 | 2011-2013 | PHASE-IN | 0.02 | - | 0.19 | 0.40 | 3.5 |
| | | PHASE-OUT | | 4.0 | - | - | |
| | | or/ ALT NOX | | - | 0.19 | 2.0 | |
| | | <u>or/ ALT NOX+NMHC⁸</u> | | <u>2.1</u> | <u>-</u> | <u>-</u> | |
| 2014 and later | FINAL | - | 0.19 | 0.40 | | | |
| 560 kW<GEN ⁶ ≤900 kW | 2011-2014 | INTERIM | 0.10 | - | 0.40 | 3.5 | 3.5 |
| | 2015 and later | FINAL | 0.03 | | 0.19 | 0.67 | |
| GEN>900 kW | 2011-2014 | INTERIM | 0.10 | - | 0.40 | 0.67 | 3.5 |
| | 2015 and later | FINAL | 0.03 | | 0.19 | | |
| ELSE ⁷ >560 kW | 2011-2014 | INTERIM | 0.10 | - | 0.40 | 3.5 | 3.5 |
| | 2015 and later | FINAL | 0.04 | | 0.19 | | |

Notes:

- 1 Propulsion marine compression-ignition engines below 37 kW are not subject to Tier 4 standards or requirements. All previously adopted requirements remain applicable for these engines.
- 2 The Tier 4 PM standard for hand-start, air cooled, direct injection engines below 8 kW is 0.60 g/kW-hr, but is not required until 2010.
- 3 Engine families in this power category may alternately meet Tier 3 PM standards from 2008-2011 in exchange for introducing final PM standards in 2012.
- 4 Manufacturers have the option of complying with the Tier 4 standards over a two year period at 50% per year using banked Tier 2 credits or over a three year period at 25% per year without the use of Tier 2 credits. The three year phase-in period is shown. The 2014 model year cannot extend beyond December 30, 2014, when the 3 year phase-in option is used.
- 5 Manufacturers may comply with the standards during the transitional implementation years using either a phase-in / phase-out approach or by using the Alternate NOx approach. The three year 25% alternate NOx ~~standard and alternate NOx + NMHC standards is~~ are shown in the table. The two year 50% ~~phase-in alternate~~ NOx standard would be 2.3 g/kW-hr. The two year 50% alternate NOx + NMHC standard would be 2.4 g/kW-hr.
- 6 "GEN" refers to generator engines only.
- 7 "ELSE" refers to all mobile machinery excluding generator engines.
- 8 An ALT NOx+NMHC standard equal to 0.5 g/kW-hr is available for one additional model year following the last model year of the ALT NOx+NMHC phase-in shown in the table.

Table 1c. – Criteria for Determining NTE Limits¹

| Pollutant | Apply NTE Multiplier of 1.25 when ... | Apply NTE Multiplier of 1.50 when ... |
|-----------|---|---|
| NOx | NOx Standard or FEL \geq 2.5 g/kW-hr | NOx Standard ² or FEL < 2.5 g/kW-hr |
| NMHC | NOx Standard or FEL \geq 2.5 g/kW-hr | NOx Standard ² or FEL < 2.5 g/kW-hr |
| NMHC+NOx | NMHC+NOx Standard or FEL \geq 2.7 g/kW-hr | NMHC+NOx Standard ² or FEL < 2.7 g/kW-hr |
| PM | PM Standard or FEL \geq 0.07 g/kW-hr | PM ² Standard or FEL ³ < 0.07 g/kW-hr |
| CO | Always | Never |

Notes:

- 1 Other provisions described in the 2008-[2010 or 2011](#) and Later Test Procedures may affect the calculation of NTE limits.
- 2 Engines must be certified to these standards without the use of ABT credits.
- 3 For engines certified to a PM FEL less than or equal to 0.01 g/kW-hr, the PM NTE limit shall be 0.02 g/kW-hr.

(2) Manufacturers may elect to include engine families in one of two averaging, banking, and trading (ABT) programs, corresponding to the engine family's model year and emissions categorization. The provisions of these separate ABT programs are specified in Part 89, Subpart C of the 2000 Plus Limited Test Procedures and Part 1039, Subpart H of the 2008-[2010 or Part I-D of the 2011](#) and Later Test Procedures [as applicable](#).

(A) For engine families subject to the 2000 Plus Limited Test Procedures, the manufacturer must set a family emission limit (FEL) not to exceed the levels contained in Table 2a. The FEL established by the manufacturer serves as the emission standard for that engine family. Table 2a follows:

Table 2a – Upper Limit for Tier 1, Tier 2, and Tier 3 Family Emission Limits (FEL)
(grams per kilowatt-hour)

| Maximum Rated Power (kW) | Tier | Model Year | NO _x | NMHC+NO _x | PM FEL |
|--------------------------|---------------------|------------|-----------------|----------------------|--------|
| kW<8 | Tier 1 | 2000-2004 | | 16.0 | 1.2 |
| | Tier 2 | 2005-2007 | | 10.5 | 1.0 |
| 8≤kW<19 | Tier 1 | 2000-2004 | | 16.0 | 1.2 |
| | Tier 2 | 2005-2007 | | 9.5 | 0.80 |
| 19≤kW<37 | Tier 1 | 2000-2003 | | 16.0 | 1.2 |
| | Tier 2 | 2004-2007 | | 9.5 | 0.80 |
| 37≤kW<56 | Tier 1 | 2000-2003 | 14.6 | | |
| | Tier 2 | 2004-2007 | | 11.5 | 1.2 |
| | Tier 3 ¹ | 2008-2011 | | 7.5 | 1.2 |
| 56≤kW<75 | Tier 1 | 2000-2003 | 14.6 | | |
| | Tier 2 | 2004-2007 | | 11.5 | 1.2 |
| | Tier 3 | 2008-2011 | | 7.5 | 1.2 |
| 75≤kW<130 | Tier 1 | 2000-2002 | 14.6 | | |
| | Tier 2 | 2003-2006 | | 11.5 | 1.2 |
| | Tier 3 | 2007-2011 | | 6.6 | 1.2 |
| 130≤kW<225 | Tier 1 | 2000-2002 | 14.6 | | |
| | Tier 2 | 2003-2005 | | 10.5 | 0.54 |
| | Tier 3 | 2006-2010 | | 6.6 | 0.54 |
| 225≤kW<450 | Tier 1 | 2000 | 14.6 | | |
| | Tier 2 | 2001-2005 | | 10.5 | 0.54 |
| | Tier 3 | 2006-2010 | | 6.4 | 0.54 |
| 450≤kW≤560 | Tier 1 | 2000-2001 | 14.6 | | |
| | Tier 2 | 2002-2005 | | 10.5 | 0.54 |
| | Tier 3 | 2006-2010 | | 6.4 | 0.54 |
| kW>560 | Tier 1 | 2000-2005 | 14.6 | | |
| | Tier 2 | 2006-2010 | | 10.5 | 0.54 |

1. Manufacturers may optionally certify engine families to the interim Tier 4 FEL caps in Table 2b for this power category through 2012.

(B) For engine families subject to the 2008-~~2010~~ or 2011 and Later Test Procedures, the manufacturer must set a family emission limit (FEL) not to exceed, as applicable, the levels contained in Table 2b. Three distinct FEL types (primary, interim, and alternate) are available conditionally. Primary FEL types are applicable to all power categories indefinitely, whereas interim and alternate FEL types are of variable duration

and may be selectively applied as applicable to total or partial engine family production volumes as described in the 2008-2010 or 2011 and Later Test Procedures. The FEL established by the manufacturer serves as the emission standard for that engine family, and is used for determining NTE limits in conjunction with the criteria in Table 1c.

Temporary compliance adjustment factors, as explained in the 2008-2010 and 2011 and Later Test Procedures as applicable, shall be applied by the manufacturer to compensate for the use of transitional alternate FELs (Type ALT 20% in Table 2b) when calculating emission credits. Table 2b follows:

Table 2b – Upper Limit for Tier 4 Family Emission Limits (FELs) and Alternate Allowances
Part 1

| MAXIMUM ENGINE POWER | FEL TYPE | MODEL YEAR | PM | NOX | NMHC+NOX |
|----------------------|---|---|-------------------------|------------------|-------------------------|
| | | | grams per kilowatt-hour | | |
| kW<8 | Primary | 2008 and later | 0.80 | - | 10.5 |
| 8≤kW<19 | Primary | 2008 and later | 0.80 | - | 9.5 |
| 19≤kW<37 | Interim | 2008-2012 | 0.60 | - | 9.5 |
| | Primary | 2013 and later | 0.05 | - | 7.5 |
| | ALT 20% ¹ | 2013-2016 ³ | 0.30 | - | 7.5 |
| | ALT 5% ² | 2017 and later ³ | | | |
| 37≤kW<56 | Interim | 2008-2012 ³ | 0.40 | - | 7.5 |
| | Primary | 2013 and later ³ | 0.05 | - | 7.5 |
| | ALT 20% | 2013-2016 ³ | 0.30 | - | 7.5 |
| | ALT 5% | 2017 and later ³ | | | |
| 56≤kW<75 | Phase-in | 2012-2013/ <u>2014</u> ⁵ | 0.04 | 0.80 | - |
| | Phase-out | | | - | 7.5 |
| | <u>Alternate</u> ALT NOx Std ⁴ | 2012-2013 | 0.04 | 3.0 ⁷ | - |
| | | 2012-2014 | | 4.4 | - |
| | <u>ALT NOx+NMHC Std</u> ⁴ | <u>2012-2013/2014</u> ⁵ | <u>0.04</u> | <u>-</u> | <u>4.7</u> ⁷ |
| | Primary | 2014/2015 ⁵ and later | 0.04 | 0.80 | - |
| | ALT 20% PM | 2012-2015 | 0.40 | | - |
| | ALT 20% NOX | 20 <u>14</u> <u>12</u> -2015 ⁶ | | 4.4 | - |
| | <u>ALT 20% NOx+NMHC Std</u> | <u>2012-2015</u> ⁶ | <u>-</u> | <u>-</u> | <u>4.7</u> |
| ALT 5% | 2016 and later | 0.40 | 4.4 | - | |

Notes:

- 1 This alternate FEL option is transitional for the four years specified and applies to at most 20% of a manufacturer's U.S. directed population of engine families per year.
- 2 This alternate FEL option is available indefinitely, but only applies to 5% of a manufacturer's U.S. directed population of engine families per year.
- 3 These dates correspond to the compliance option of meeting interim standards in 2008; else the primary and alternate FEL caps would begin and/or end one year earlier, and 2008-2011 engines would not be eligible for participation in the Tier 4 ABT program.
- 4 Two alternate NOx standards and corresponding FEL caps are available for this category with corresponding alternate phase-in options. Two alternate NOx+NMHC standards are also available; the FEL caps are the previously applicable NOx+NMHC standards from Table 1a of this section.
- 5 The effective date of the primary FEL cap follows the phase-in period and use of banked Tier 2 NOx credits of the selected NOx FEL cap.
- 6 If interim Tier 4 standards are not met in 2008, the alternate NOx FEL would only be available for 2015. For manufacturers certifying engines in this power category using a percentage phase-in/phase-out approach instead of the ALT NOx or ALT NOx+NMHC standards in Table 1b of §2423(b)(1)(B), the alternate NOx and NOx+NMHC FEL caps in the table apply only in the 2014-2015 model years if certifying in accordance with the provisions in §1039.102(d)(1) of the 2011 and Later Test Procedures, and only in the 2015 model year if certifying under §1039.102(d)(2) of the 2011 and Later Test Procedures.
- 7 If neither the alternate phase-in option nor banked Tier 2 credits are used, either NOx standard, or the NOx+NMHC standard, and corresponding FEL may be applied for this category.

Table 2b – Upper Limit for Tier 4 Family Emission Limits (FELs) and Alternate Allowances
Part 2

| MAXIMUM ENGINE POWER | FEL TYPE | MODEL YEAR | PM | NOX | NMHC+NOX | |
|----------------------|---|-------------------------------------|-------------------------|------------------|-------------------------|------------|
| | | | grams per kilowatt-hour | | | |
| 75≤kW<130 | Phase-in | 2012-2013/ <u>2014</u> ⁵ | 0.04 | 0.80 | - | |
| | Phase-out | | | - | 6.6 | |
| | <u>Alternate</u> ALT NOx Std ⁴ | 2012-2013 | | 3.0 ⁷ | - | |
| | | 2012-2014 | | 3.8 | - | |
| | <u>ALT NOx+NMHC Std</u> ⁴ | <u>2012-2013/2014</u> ⁵ | | - | <u>4.0</u> ⁷ | |
| | Primary | 2014/2015 ⁵ and later | | 0.80 | - | |
| | ALT 20% PM | 2012-2015 | | 0.30 | | - |
| | ALT 20% NOX | <u>2011-2015</u> ⁶ | | | 3.8 | - |
| | <u>ALT 20% NOx+NMHC Std</u> ⁴ | <u>2012-2015</u> ⁶ | | - | - | <u>4.0</u> |
| ALT 5% | 2016 and later | 0.30 | 3.8 | - | | |
| 130≤kW≤560 | Phase-in | 2011-2013 | 0.04 | 0.80 | - | |
| | Phase-out | | | - | 6.6/6.4 ⁸ | |
| | <u>Alternate</u> ALT NOx Std | 2011-2013 | | 2.7 | - | |
| | <u>ALT NOx+NMHC Std</u> | <u>2011-2013</u> | | - | <u>4.0</u> | |
| | Primary | 2014 and later | | 0.80 | - | |
| | ALT 20% PM | 2011-2014 | | 0.20 | | - |
| | ALT 20% NOX | <u>2011-2014</u> ⁹ | | | 3.8 | - |
| | <u>ALT 20% NOx+NMHC Std</u> | <u>2011-2014</u> ⁹ | | - | - | <u>4.0</u> |
| GEN>560kW | Interim | 2011-2014 | 0.20 | 6.2 | - | |
| | Primary | 2015 and later | 0.05 | 1.07 | - | |
| | ALT 20% | 2015-2018 | 0.10 | 3.5 | - | |
| | ALT 5% | 2019 and later | | | - | |
| ELSE>560kW | Interim | 2011-2014 | 0.20 | 6.2 | - | |
| | Primary | 2015 and later | 0.07 | | - | |
| | ALT 20% | 2015-2018 | 0.10 | | - | |
| | ALT 5% | 2019 and later | | | - | |

Notes:

- 4 Two alternate NOx standards and corresponding FEL caps are available for this category with corresponding alternate phase-in options. Two alternate NOx+NMHC standards are also available; the FEL caps are the previously applicable NOx+NMHC standards from Table 1a of this section.
- 5 The effective date of the primary FEL cap follows the phase-in period and use of banked Tier 2 NOx credits of the selected NOx FEL cap.
- 6 If interim Tier 4 standards are not met in 2008, the alternate NOx FEL would only be available for 2015. For manufacturers certifying engines in this power category using a percentage phase-in/phase-out approach instead of the ALT NOx or ALT NOx+NMHC standards in Table 1b of §2423(b)(1)(B), the ALT NOx and ALT NOx+NMHC FEL caps in the table apply only in the 2014-2015 model years if certifying in accordance with the provisions in §1039.102(d)(1) of the 2011 and Later Test Procedures, and only in the 2015 model year if certifying under §1039.102(d)(2) of the 2011 and Later Test Procedures.
- 7 If neither the alternate phase-in option nor banked Tier 2 credits are used, either NOx standard, or the NOx+NMHC standard, and corresponding FEL may be applied for this category.
- 8 The phase-out NMHC+NOX FEL cap is 6.6 g/kW-hr for engines < 225 kW, and 6.4 g/kW-hr for engines ≥ 225 kW in this category.
- 9 For manufacturers certifying engines in this power category using the percentage phase-in/phase-out approach instead of the ALT NOx standard or the ALT NOx+NMHC standard in Table 1b of §2423(b)(1)(B), the ALT NOx and ALT NOx+NMHC FEL caps in the table applies

(C) *Split family provision.* For generating or using credits in the $56 \leq \text{kW} \leq 560$ power categories during the phase-in of Tier 4 standards, engine manufacturers may elect to split an engine family into two subfamilies (e.g., one which uses credits and one which generates credits for the same pollutant). The engine manufacturer must indicate in the application for certification that the engine family is to be split, and may calculate emission credits relative to different emission standards (i.e., phase-in and phase-out standards) for different sets of engines within the engine family, but must certify the engine family to a single set of standards and FELs. The engine manufacturer shall calculate NMHC+NOx emission credits by adding the NOx FEL to the NMHC phase-in standard for comparison with the applicable NMHC+NOx phase-out standard. Any engine family certified under the provisions of this paragraph (C) must meet the applicable phase-in standard for NMHC. The engine manufacturer shall be responsible for assigning the number and configurations of engines within the respective subfamilies before the due date of the final report required in Part 1039, Subpart H of the 2008-2010 Test Procedures or Part I-D of the 2011 and Later Test Procedures as applicable. The same label must be applied to each engine in the family, and must include the NOx FEL to which the engine is certified.

(3)(A) The opacity of smoke emissions from new 1996 through 1999 model year heavy-duty off-road compression-ignition engines 175 to 750 horsepower, inclusive, or from all new 2000 and later model year compression-ignition engines sold in this state, shall not exceed, based on the applicable measurement techniques specified in Part 89, Subpart B of the 2000 Plus Limited Test Procedures and Part 1039, Subpart B of the 2008-2010 Test Procedures or Part I-D of the 2011 and Later Test Procedures as applicable, the following:

1. 20 percent during the engine acceleration mode.
2. 15 percent during the engine lugging mode.
3. 50 percent during the peaks in either mode.

(B) The following engines are exempt from the requirements of this paragraph (3):

1. Single-cylinder engines.
2. Propulsion marine compression-ignition engines.
3. Constant-speed engines.
4. Engines certified to a PM emission standard or FEL of 0.07 grams per kilowatt-hour or lower.

(4) Low-emitting Blue Sky Series engines requirements.

(A) *Voluntary standards.* Engines subject to the standards in (b)(1)(A) may be designated “Blue Sky Series” engines by meeting the voluntary standards contained in Table 3, which apply to all certification and in-use testing. Blue Sky Series engines shall not be included in the Averaging, Banking, and Trading program. Table 3 follows:

Table 3. – Voluntary Emission Standards
(grams per kilowatt-hour)

| Maximum Rated Power (kW) | NMHC+NO _x | PM |
|--------------------------|----------------------|------|
| KW<8 | 4.6 | 0.48 |
| 8≤kW<19 | 4.5 | 0.48 |
| 19≤kW<37 | 4.5 | 0.36 |
| 37≤kW<75 | 4.7 | 0.24 |
| 75≤kW<130 | 4.0 | 0.18 |
| 130≤kW≤560 | 4.0 | 0.12 |
| KW>560 | 3.8 | 0.12 |

(B) *Additional standards.* Blue Sky Series engines are subject to all provisions that would otherwise apply under this part, except as specified in (C) of this section.

(C) *Test Procedures.* NO_x, NMHC, and PM emissions are measured using the procedures set forth in 40 CFR part 86, subpart N (July 1, 1999), which is incorporated by reference, in lieu of the procedures set forth in subpart E of the 2000 Plus Limited Test Procedures. CO emissions may be measured using procedures set forth in 40 CFR part 86, subpart N (July 1, 1999), or in subpart E of the 2000 and Later Test Procedures. Manufacturers may use an alternate procedure to demonstrate the desired level of control if approved in advance by the Executive Officer. Engines meeting the requirements to qualify as Blue Sky Series engines must be capable of maintaining a comparable level of emission control when tested using the procedures set forth in both Section 89.112(c) and subpart E of the 2000 and Later Test Procedures. The numerical emission levels measured using the procedures from subpart E of the 2000 Plus Limited Test Procedures may be up to 20 percent higher than those measured using procedures from 40 CFR part 86, subpart N (July 1, 1999), and still be considered comparable.

(5)(A) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1996-1999 model year heavy-duty off-road compression-ignition engine or any Tier 2 or later off-road compression-ignition engine subject to the 2000 Plus Limited Test Procedures. This provision does not apply to petroleum-fueled diesel cycle engines using turbochargers, pumps, blowers, or superchargers for air induction.

(B) For off-road compression-ignition engines subject to the 2008-2010 or 2011 and Later Test Procedures, no crankcase emissions shall be discharged directly into the ambient atmosphere from any engine, unless the sum of those discharged emissions are added to the exhaust emissions (either physically or mathematically) during all emission testing. To be eligible for this option, a manufacturer must design its engines so that all crankcase emissions can be routed into the applicable sampling systems specified in the 2008-2010 or 2011 and Later Test Procedures as applicable, and must

account for deterioration in crankcase emissions when determining exhaust deterioration factors. Crankcase emissions that are routed to the exhaust upstream of exhaust aftertreatment during all operation are not considered to be discharged directly into the ambient atmosphere. Furthermore, engines using charge-air compression that are certified to a transitional alternate FEL (Type ALT 20% in Table 2b) during the first four years of the Tier 4 standards for the applicable power category are exempt from this subsection, but must instead comply with the requirements in Section 2423(b)(5)(A).

(6) Engine manufacturers that voluntarily certify engines to the Tier 4 standards in Table 1b earlier than required under this article may, according to the provisions in the 2008-2010 or 2011 and Later Test Procedures as applicable, generate additional ABT credits, or as an alternative, offset future Tier 4 compliance requirements should the equipment manufacturer that was provided the engine decline to use its early introduction incentives according to the provisions in Section 2423(d)(9). Table 4, as follows, summarizes the incentives for the early introduction of Tier 4 engines and some of the conditions that determine eligibility.

Table 4. – Early Introduction Incentives for Engine Manufacturers

| EARLY INTRODUCTION | POWER CATEGORY | QUALIFYING STANDARDS ¹ grams per kilowatt-hour | PER-ENGINE INCENTIVE |
|-----------------------------------|----------------|--|----------------------|
| Final Tier 4 PM-Only ² | 19 ≤ kW < 56 | 0.03 PM | 3 for 2 PM-Only |
| | 56 ≤ kW < 560 | 0.02 PM | |
| Final Tier 4 ALL | 19 ≤ kW < 56 | 0.03 PM / 4.7 NMHC+NOx | 3 for 2 |
| | 56 ≤ kW ≤ 560 | 0.02 PM / 0.40 NOx / 0.19 NMHC | |
| | GEN > 560 | 0.03 PM / 0.67 NOx / 0.19 NMHC | |
| | ELSE > 560 | 0.04 PM / 3.5 NOx / 0.19 NMHC | |
| Ultra Low NOx | kW ≥ 19 | Final Tier 4 PM & NMHC / 0.20 NOx | 2 for 1 |

Notes:

- 1 All engines must meet the Tier 4 crankcase emissions requirements. Engines must certify using all test and other requirements otherwise required for final Tier 4 standards such as for transient and not-to-exceed limits.
- 2 Offsets must be earned prior to the start of phase-in requirements (prior to 2013 for 19 ≤ kW < 56 engines, prior to 2012 for 56 ≤ kW < 130 engines, prior to 2011 for 130 ≤ kW ≤ 560 engines, prior to 2015 for > 560 kW engines)

(7) *Provisions for small-volume manufacturers.* Small-volume engine manufacturers are entitled to special compliance provisions under this paragraph, but must notify the Executive Officer in writing before January 1, 2008, of the intent to use the provisions.

(A) Small-volume engine manufacturers may delay complying with certain otherwise applicable Tier 4 emission standards and requirements as described in the following table:

Table 5. – Small-Volume Engine Manufacturer Provisions

| Maximum Engine Power | Temporary Relief Replacement Standards | Delay End Date (Model Year) |
|----------------------|---|-----------------------------|
| kW < 19 | Tier 2 | 2011 |
| 19 ≤ kW < 37 | Interim Tier 4 | 2016 |
| 37 ≤ kW < 56 | See paragraph (7)(B) of this section for special provisions that apply for engines in this power range. | |
| 56 ≤ kW < 130 | Tier 3 | 2015 |

(B) The provisions of this paragraph (7) for engines $37 \leq \text{kW} < 56$ are applicable per one of the following options:

1. Manufacturers that comply with the 0.30 g/kW-hr PM standard in all model years from 2008 through 2012 without using PM credits may continue meeting that standard through 2015.

2. Manufacturers that choose not to comply with paragraph (7)(B)1. of this section may continue to comply with the standards and requirements in the 2000 Plus Limited Test Procedures for model years through 2012, but must begin complying in 2013 with the Tier 4 standards and requirements specified in Table 1b for model years 2013 and later.

(C) After the period of relief indicated in paragraphs (7)(A) and (B) of this section has expired, small-volume engine manufacturers must comply with the same Tier 4 standards and requirements as all other manufacturers.

(D) For engines not in the $19 \leq \text{kW} < 56$ power range, small-volume engine manufacturers must meet the following conditions for the model years in which compliance with the otherwise applicable standards under this paragraph (7) is delayed:

1. Produce engines that meet all the emission standards and other requirements under the 2000 Plus Limited Test Procedures applicable for that model year, except as noted in this paragraph (7).

2. Meet the labeling requirements in the 2000 Plus Limited Test Procedures, but must use the following in place of the otherwise required statement of compliance in Section 2424(c)(2): "THIS ENGINE COMPLIES WITH CALIFORNIA REGULATIONS

FOR [CURRENT MODEL YEAR] OFF-ROAD COMPRESSION-IGNITION ENGINES UNDER 13 CCR 2423(b)(7)." The referencing of similar federal requirements under this provision is permitted.

3. Small-volume engine manufacturers must notify the equipment manufacturer that the engines produced under this section are excluded from the production volumes associated with the equipment manufacturer flexibility program in Section 2423(d).

(E) For engines in the $19 \leq \text{kW} < 56$ power range, small-volume engine manufacturers must meet the following conditions for the model years in which compliance with the otherwise applicable standards under this paragraph (7) is delayed:

1. Produce engines in those model years that meet all the emission standards and other requirements that applied for model year 2008 engines in the same power category.

2. Meet the labeling requirements in Section 2424(c)(3), but use the following compliance statement instead of the compliance statement in Section 2423(c)(3): "THIS ENGINE COMPLIES WITH CALIFORNIA REGULATIONS FOR [CURRENT MODEL YEAR] OFF-ROAD COMPRESSION-IGNITION ENGINES UNDER 13 CCR 2423(b)(7)." The referencing of similar federal requirements under this provision is permitted.

3. Notify the equipment manufacturer that engines produced under this section are excluded from the production volumes associated with the equipment-manufacturer allowance program in Section 2423(d).

(F) The provisions of this paragraph (7) may not be used to circumvent the requirements of this article.

(8) *Useful life.* For purposes of certification, a manufacturer must demonstrate compliance with the standards set forth in this paragraph (b) over the full useful life of the engine, as defined in the applicable test procedures.

(9) *NTE deficiencies.* A manufacturer may petition the Executive Officer to accept an off-road compression-ignition engine as compliant with the NTE requirements specified in the 2008-~~2010 or 2011~~ and Later Test Procedures as applicable even though specific elements of those requirements may not be fully met. Such grants of compliance, otherwise known as deficiencies, shall be limited to engines that have functioning emission-control hardware capable of allowing the engine to comply with the NTE limits. Deficiencies shall be granted by the Executive Officer according to the following stipulations:

(A) A manufacturer must apply for specific deficiencies at the time of, or prior to, submitting its application for certification. Deficiencies shall be assigned for an engine

model within an engine family. The Executive Officer shall not approve deficiencies that are requested retroactively to cover engines already certified. The scope of each deficiency must be clearly identified in the certification application, and any auxiliary emission control device(s) used to control emissions to the lowest practical level must be identified with respect to each deficiency that is being requested.

(B) Deficiencies shall only be approved if compliance would be infeasible or unreasonable considering factors such as the technical feasibility of the given hardware, the availability of lead time, production cycles including the phase-in or phase-out of engines or vehicle designs, and planned computers upgrades. Other relevant factors may be considered.

(C) Deficiencies shall expire after a single model year and may be limited to specific engine configurations. The Executive Officer may approve a manufacturer's request for the same deficiency in the following model year if correcting the deficiency would require extreme hardware or software modifications and the manufacturer has demonstrated an acceptable level of effort toward complying.

(D) The number of deficiencies available to a manufacturer shall not be limited during the first three model years in which NTE limits apply to the manufacturer's engines. For the next four model years, up to three deficiencies per engine family shall be available to a manufacturer. Deficiencies of the same type that apply similarly to different power ratings within a family shall count as one deficiency per family. The Executive Officer may conditionally approve additional deficiencies during these four years, but may impose stipulations on their applicability as appropriate. Deficiencies shall not be approved beyond the seven-year period specified in this paragraph (8).

(10) *Adjustable parameters.* Manufacturers that design engines with adjustable parameters must meet all the requirements of this paragraph (b) for any adjustment in the physically adjustable range. An operating parameter is not considered adjustable if it is permanently sealed or if it is not normally accessible using ordinary tools. The Executive Officer may require that the adjustable parameters be set to any specification within the adjustable range during any testing, including certification testing, selective enforcement auditing, or in-use testing.

(11) *Prohibited controls.* A manufacturer shall not design 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.

(12) *Defeat devices.* Engines equipped with a defeat device shall not be certified for sale in California. A defeat device is a component or system that reduces the effectiveness of emission controls under conditions that the engine may reasonably be expected to encounter during normal operation and use. This prohibition does not apply to auxiliary-emission control devices identified in the certification application if one of more of the following is true:

(A) The operating conditions where the auxiliary-emission control device is active were substantially encountered during all testing requirements as described in Part 1039, Subpart F of the [2008-2010 Test Procedures or Part I-D of the 2011](#) and Later Test Procedures [as applicable](#).

(B) The design of the auxiliary-emission control device is shown to be necessary for preventing engine (or equipment) damage or accidents.

(C) The auxiliary-emission control device only reduces the effectiveness of emissions control during engine starting.

(c)(1) The test procedures for determining certification and compliance with the standards for gaseous exhaust emissions from new 1996-1999 heavy-duty off-road compression-ignition engines sold in the state are set forth in the 1996-1999 Heavy-Duty Test Procedures.

(2)(A) The test procedures for determining certification and compliance with the standards for gaseous exhaust emissions and the standards for opacity of smoke emissions from new 2000 model year and later off-road compression-ignition engines for which the standards in paragraph (b)(1)(A) are applicable, and sold in the state, are set forth in the 2000 Plus Limited Test Procedures.

(B) The test procedures for determining certification and compliance with the standards for gaseous exhaust emissions, particulate exhaust emissions, opacity of smoke emissions, and not-to-exceed emissions from new 2008 model year and later off-road compression-ignition engines for which the limits in paragraph (b)(1)(B) are applicable, and sold in the ~~s~~State, are set forth in the 2008-[2010 or 2011](#) and Later Test Procedures [as applicable](#).

(3) The test procedures for determining certification and compliance with the standards for particulate exhaust emissions from new 1996 and later off-road compression-ignition engines for which the standards in paragraph (b)(1)(A) are applicable, and sold in the state, are set forth in the PM and Test Cycle Limited Test Procedures.

(4) The test procedures for determining certification and compliance with the standards for the opacity of smoke emissions from new 1996-1999 off-road compression-ignition engines sold in the state are set forth in the 1996-1999 Smoke Test Procedures.

(d) *Implementation flexibility for equipment and vehicle manufacturers and post-manufacture marinizers.* For a limited time, off-road equipment and vehicle manufacturers and post-manufacture marinizers may produce equipment with engines that are subject to less stringent emission standards than required by Tables 1a and 1b

for new 2000 model year and later off-road equipment and vehicles and marine compression-ignition engines, subject to the requirements of paragraph (e) of this section. Separate provisions are provided for equipment with engines subject to the 2000 Plus Limited Test Procedures versus equipment with engines subject to the 2008-2010 or 2011 and Later Test Procedures as applicable, and are identified accordingly in the following subsections. Only manufacturers that have primary responsibility for designing and manufacturing equipment, and have manufacturing procedures for installing engines in equipment, are eligible to participate in the equipment manufacturer flexibility program provided by the 2008-2010 or 2011 and Later Test Procedures as applicable. Equipment manufacturers participating in this flexibility program must comply with the notification and reporting requirements specified in Section 2423(d)(7). Engines produced for this flexibility program using FELs greater than the applicable standards must be offset with sufficient ABT credits. The following allowances apply separately to each engine power category subject to standards under Section 2423(b)(1):

(1) *Percent-of-production allowances.*

(A) *Equipment rated at or above 37kW and subject to the 2000 Plus Limited Test Procedures.* A manufacturer may produce equipment and vehicles with engines rated at, or above, 37kW that are exempted from meeting current model year emission standards for a portion of its California-directed production volume. These percent-of-production flexibility allowances must be used within the seven years immediately following the date on which Tier 2 engine standards first apply to engines used in such equipment and vehicles, provided that the seven-year sum of the U.S.-directed portion of the manufacturer's percent-of-production flexibility allowances does not exceed 80 percent, expressed in cumulative yearly percentage increments, and provided that all such equipment and vehicles contain only engines that have been certified to the Tier 1 or Tier 2 standards;

(B) *Equipment rated under 37kW and subject to the 2000 Plus Limited Test Procedures.* A manufacturer or post-manufacture marinizer may produce equipment and vehicles and marine engines with engines rated under 37kW that are exempt from meeting current model year emission standards for a portion of its California-directed production volume. These percent-of-production flexibility allowances must be used within the seven years immediately following the date on which Tier 1 engine standards first apply to engines used in such equipment and vehicles and marine engines, provided that the seven-year sum of the U.S.-directed portion of the manufacturer's percent-of-production flexibility allowances does not exceed 80 percent, expressed in cumulative yearly percentage increments;

(C) *Equipment subject to the 2008-2010 or 2011 and Later Test procedures.* A manufacturer may produce equipment and vehicles with engines that are exempt from meeting current model year emission standards for a portion of its California-directed production volume. These percent-of-production flexibility allowances must be used

within one of the seven-year flexibility usage periods specified in Table 6 for each applicable power category, provided that the seven-year sum of the U.S.-directed portion of the manufacturer's percent-of-production flexibility allowances does not exceed 80 percent, expressed in cumulative yearly percentage increments, except as provided for in paragraph (d)(6) or (f). Equipment used as percent-of-production flexibility allowances must contain only engines that have been certified to, at least, the standards listed in Table 6, corresponding to the flexibility usage period selected by the manufacturer. All flexibility allowances for a power category must be used within the same flexibility usage period.

Table 6. – Tier 4 Flexibility Allowance Options

| Power Category | 7 Year Usage Period | Flexibility Standard ¹ |
|----------------|----------------------------|---------------------------------------|
| < 19 kW | 2008 – 2014 | Tier 2 |
| 19 ≤ kW < 56 | 2008 – 2014 ^{1,2} | Tier 3 Tier 2 ² |
| | 2012 - 2018 | 2008 Interim Tier 4 |
| 56 ≤ kW < 130 | 2012 - 2018 | Tier 3 |
| | 2014 - 2020 | 2012 Interim Tier 4 |
| 130 ≤ kW ≤ 560 | 2011 - 2017 | Tier 3 |
| | 2014 - 2020 | 2011 Interim Tier 4 |
| > 560 kW | 2011 - 2017 | Tier 2 |
| | 2015 - 2021 | 2011 Interim Tier 4 |

Notes:

¹ ~~Engines certified to FELs for the flexibility standards indicated still comply with the emission Tier requirements; however, engines using FELs greater than the applicable standards must be off-set with sufficient ABT credits.~~

^{1,2} This usage period is not available for allowances greater than or equal to 37 kW unless interim Tier 4 standards have been met starting in 2008.

² ~~Flexibility allowances under 37kW may contain engines certified to the Tier 2 standards.~~

(2)(A) *Small volume allowances subject to the 2000 Plus Limited Test Procedures.* An off-road equipment or vehicle manufacturer or post-manufacture marinizer may exceed the production percentages in paragraphs (d)(1)(A) and (B) of this section for a portion of its California-directed production, provided that in each regulated power category the manufacturer's total number of U.S.-directed off-road equipment and vehicles and marine diesel applications that contain engines which are exempt from meeting current model year emission standards over the years in which the percent-of-production allowance applies:

1. does not exceed 100 units times the number of years in which the percent-of-production allowance applies, and
2. does not exceed 200 units in any year, and

3. does not use engines from more than one engine family.

(B) *Small volume allowances subject to the 2008-2010 or 2011 and Later Test Procedures as applicable*. As an alternative to the percent-of-production allowance in Section 2423(d)(1)(C), an off-road equipment or vehicle manufacturer may produce equipment with engines that are exempt from meeting current model year emission standards for a portion of its California-directed production volume, provided that the exempt equipment is a subset of the manufacturer's U.S.-directed volume of exempt equipment and the manufacturer is in compliance with the following provisions:

1. *Single engine family provision*. A manufacturer may claim up to 700 U.S.-directed flexibility allowances within a power category during one of the seven-year flexibility usage periods specified in Table 6, but no more than 200 allowances in a single year within a power category, except as provided for in paragraph(d)(6) or (f). Engines within a power category that are used in these flexibility allowances must be from a single engine family within a given year.

2.a. *Multiple engine family provision for flexibility allowances below 130 kW*. A manufacturer may claim up to 525 U.S.-directed flexibility allowances within a power category during one of the seven-year flexibility usage periods specified in Table 6, but no more than 150 allowances in a single year within a power category, except as provided for in paragraph (d)(6) or (f). Engines within a power category that are used in these flexibility allowances may be from multiple engine families within a given year.

b. *Multiple engine family provision for flexibility allowances at or above 130 kW*. A manufacturer may produce up to 350 U.S.-directed flexibility allowances within a power category during one of the seven-year flexibility usage periods specified in Table 6, but no more than 100 allowances in a single year within a power category, except as provided for in paragraph (d)(6) of (f). Engines within a power category that are used in these flexibility allowances may be from multiple engine families within a given year.

(3)(A) *Inclusion of previous-tier engines*. Off-road equipment and vehicles and marine diesel engines built with previous tier or noncertified engines under the existing inventory provisions of the 2000 Plus Limited Test Procedures (40 CFR Section 89.1003(b)(4)) need not be included in determining compliance with paragraphs (d)(1)(A) and (B) and (d)(2)(A) of this section.

(B) *Inclusion of engines not subject to Tier 4 requirements*. Off-road equipment and vehicles built with engines otherwise exempt from the requirements of the 2008-2010 or 2011 and Later Test Procedures as applicable are not required to be counted toward the percentage, or number, of claimed flexibility allowances under the provisions in Subsections (d)(1)(C) and (d)(2)(B). Such exempted engines include unused inventories produced prior to the effective date of the Tier 4 standards, excluding stockpiled engines, and hand-startable, air cooled, direct-injection engines below 8 kW

in 2008 and 2009 that do not meet the Tier 4 PM standard. Nonetheless, manufacturers may choose to include these engines in the count of total equipment produced from which the percentage of flexibility allowances in Subsection (d)(1)(C) is derived.

(4) *Early-use of flexibility allowances.* Manufacturers may start using a portion of the flexibility allowances in Subsections (d)(1)(C) and (d)(2)(B) for equipment and vehicles containing engines not yet subject to the Tier 4 standards, provided that the seven-year period for using flexibility allowances under the 2000 Plus Limited Test Procedures flexibility program has expired. All equipment and vehicles claimed as flexibility allowances under this early-use provision must contain engines that have been certified to, at least, the Tier 1 or Tier 2 standards. Manufacturers must count these Tier 2 or Tier 3 equipment and vehicles toward the total percentage, or number, of flexibility allowances permitted under the provisions of Sections (d)(1)(C) and (d)(2)(B). The maximum cumulative early-use allowance is 10 percent under the percent-of-production provision in Section (d)(1)(C), or 100 units under the small volume provision in Section (d)(2)(B). Table 7 shows the applicable years for using early-use flexibility allowances. Table 7 follows:

Table 7. – Years for Early-Use Flexibility Allowances

| Maximum Engine Power | Calendar Years |
|----------------------|----------------|
| kW < 19 | 2007 |
| 19 ≤ kW < 37 | 2006 - 2011 |
| 37 ≤ kW < 56 | 2011 |
| 56 ≤ kW < 75 | 2011 |
| 75 ≤ kW < 130 | 2010 - 2011 |
| 130 ≤ kW < 225 | 2010 |
| 225 ≤ kW < 450 | 2008 - 2010 |
| 450 ≤ kW ≤ 560 | 2009 - 2010 |
| > 560 kW | - |

(5) *Labeling requirements.* Allowances claimed under the Tier 2/3 or Tier 4 equipment flexibility programs must be labeled, as appropriate, per the following:

(A) *Engine labeling.* Except for engines used in flexibility allowances prior to January 1, 2007, engine manufacturers shall meet the labeling requirements provided in Section 2424, except that manufacturers may omit the family emission limits from the label only if the limits are more stringent than the emissions standards, with the following substitutions:

For flexibility engines meeting previous year emission requirements, the engine manufacturer shall substitute the following for the statement of compliance required in Sections 2424(c)(1)(E)6 and 2424(c)(2):

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

For flexibility engines less than 37 kW and not subject to emission requirements under the Tier 2/3 program, the engine manufacturer shall substitute the following for the statement of compliance required in Section 2424(c)(1)(E)6:

“THIS ENGINE QUALIFIES FOR USE IN EQUIPMENT RATED BELOW 37 KW BY PROVISION OF 13 CCR 2423(d). SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN FOR THE EQUIPMENT FLEXIBILITY PROVISIONS CITED MAY BE A VIOLATION OF CALIFORNIA LAW SUBJECT TO CIVIL PENALTY.”

As an alternative for flexibility engines produced under the Tier 2/3 program, and for which the engine manufacturer offers proof to the Executive Officer that the otherwise required statements of compliance in this subsection would be unduly burdensome or costly to implement, engine manufacturers may instead use the following:

“THIS ENGINE CONFORMS TO CALIFORNIA OFF-ROAD COMPRESSION-IGNITION ENGINE REGULATIONS UNDER 13 CCR 2423(d).” [Insert Engine Family Name if Certified]

These revised statements of compliance do not preclude the referencing of similar federal requirements that would be satisfied simultaneously by meeting the provisions of Section 2423(d). Furthermore, the Executive Officer may, upon request, approve alternate labeling specifications that are equivalent to the specifications in this subsection.

(B) *Equipment Labeling.* For all allowances claimed under the Tier 4 flexibility program, equipment manufacturers shall affix a permanent label to the engine, or to a readily visible section of the equipment that cannot be easily removed. The label shall be in the English language, shall supplement the manufacturer’s emission control information label, and shall include the following information:

1. The label heading “EMISSION CONTROL INFORMATION”.
2. The equipment manufacturer’s corporate name and trademark.
3. The calendar year in which the equipment is manufactured.

4. ~~The name, An~~ e-mail address, and phone number ~~of a person~~ to contact for further information, or a website that includes this contact information.
5. The following statement:
“THIS EQUIPMENT [or identify the type of equipment] HAS AN ENGINE THAT MEETS CALIFORNIA EMISSION STANDARDS UNDER 13 CCR 2423(d).”

This label content does not preclude the referencing of similar federal requirements that would be satisfied simultaneously by meeting the provisions of Section 2423(d).

(6) *Technical hardship allowances.* Equipment manufacturers may apply for additional flexibility allowances should extreme and unusual circumstances occur leading to technical obstacles in complying with the Tier 4 requirements. A manufacturer may request additional allowances for power categories $19 \leq \text{kW} \leq 560$ if it claims allowances under the provisions of Section 2423(d)(1)(C), but may only request additional allowances for power categories $19 \leq \text{kW} < 56$ if it claims allowances under the provisions of Section 2423(d)(2)(B). Additional flexibility allowances shall not be provided when the engine and equipment are produced by the same manufacturer, or affiliate. The Executive Officer shall review requests for additional flexibility allowances according to the following stipulations:

(A) The manufacturer requesting additional allowances must demonstrate that the circumstances necessitating them were outside the control of the manufacturer and could not have been avoided with reasonable discretion. The manufacturer must also demonstrate that it has exercised prudent planning and has taken reasonable steps to minimize the scope of the request.

(B) Manufacturers applying for additional flexibility allowances must do so in writing to the Chief of the Mobile Source Operations Division, or designee, prior to the earliest date in which the applying manufacturer would be in violation of Section 2423(b)(1). All applications shall provide, at a minimum, the following information:

1. A description of the manufacturer's equipment design process.
2. A description of the relationship with the engine supplier regarding product design.
3. An explanation of the technical hardship leading to this request, why it cannot be addressed without additional flexibility allowances, and an explanation of the circumstances behind the technical hardship and why it was unavoidable.
4. A description of the information and products provided by the engine supplier related to equipment design, including specifications, performance data, prototypes, and the dates of delivery.

5. A comparison of the design processes of the equipment model(s) for which additional allowances are needed versus those of other models that do not need additional allowances, and an explanation of how the technical differences between the models justify the request for additional allowances.

6. A description of all efforts to find and use other compliant engines, or otherwise an explanation why none are available.

7. A description of the steps taken to minimize the scope of the manufacturer's request, and any other relevant information.

8. An estimation of the number of additional allowances needed for each equipment model covered by the request, subject to Sections 2423(d)(6)(C) and (d)(6)(D) below.

Notwithstanding, the Executive Officer may require additional information as deemed necessary before making a determination for relief.

(C) The following limits shall apply for additional flexibility allowances granted in connection to the percent-of-production provisions in Section 2423(d)(1)(C):

1. A manufacturer's California-directed share of additional flexibility allowances for each power category shall be a subset of its U.S.-directed allowances for the same power category, provided that the additional U.S.-directed allowances do not exceed 70 percent of the U.S.-directed volume of production for the power category for one year.

2. All primary percent-of-production allowances must be completely used up prior to the use of any additional flexibility allowances.

3. All additional allowances shall expire 24 months after the start of the applicable flexibility usage period for each power category, as specified in Table 6. These allowances shall only be used for the specific equipment models covered in the manufacturer's written application for relief.

(D) The following limits shall apply for additional flexibility allowances granted in connection to the small volume provisions in Section 2423(d)(2)(B):

1. Only small equipment manufacturers, as defined below, that have not been granted additional flexibility allowances for the $19 \leq \text{kW} < 56$ power category under Section 2423(d)(6)(C), are eligible to request additional flexibility allowance under this provision.

“Small equipment manufacturer,” for the purpose of this provision, means a federally defined small-business equipment manufacturer that had an annual U.S.-directed production volume of equipment using off-road diesel engines $19 \leq \text{kW} < 56$ of no more than 3,000 units in 2002 and all earlier calendar years, and has 750 or fewer employees (500 or fewer employees for nonroad equipment manufacturers that produce no construction equipment or industrial trucks). For manufacturers owned by a parent company, the production limit applies to the production of the parent company and all its subsidiaries and the employee limit applies to the total number of employees of the parent company and all its subsidiaries.

2. All primary small volume allowances for the $19 \leq \text{kW} < 56$ power category must be completely used up for a given year prior to the use of additional flexibility allowances.

3. Additional allowances shall only be used for equipment with engines rated $19 \leq \text{kW} < 37$.

4. A manufacturer's California-directed share of additional flexibility allowances under this provision shall be a subset of its U.S.-directed allowances, which shall not exceed 1,100.

5. All additional allowances shall expire 36 months after the start of the applicable flexibility usage period for each power category, as specified in Table 6. The allowances shall only be used for the specific equipment models covered in the manufacturer's written application for relief. The additional allowances are not subject to small volume annual limits.

(7) Notification and reporting requirements for using Tier 4 flexibility allowances.

As a prerequisite to using any Tier 4 flexibility allowances, the equipment manufacturer shall notify the ARB of its intent to use such allowances. The manufacturer shall also send an annual report after each year that flexibility allowances have been used to verify that the allowances claimed do not exceed the number of allowances permitted.

(A) Before ~~January 1 of the first year that~~ flexibility provisions will be used, a written notice informing ARB of the manufacturer's intent to use flexibility allowances must be sent to the Chief of the Mobile Source Operations Division, or designee, containing the following information:

1. The equipment manufacturer's name and address, and the name and address of the parent company, if applicable.

2. The name, ~~and~~ telephone number, and e-mail address of a person to contact for more information.

3. The calendar years for which the Tier 4 flexibility provisions shall apply.
4. ~~The~~Each engine manufacturer's name and address ~~that expected to~~ produces the engines which will be used in the equipment claimed as flexibility allowances.
5. An accurate estimate of the number of flexibility allowances in each power category that will be produced under the percent-of-production provisions in Section 2423(d)(1)(C), or the small volume provisions in Section 2423(d)(2)(B).
6. A tabulation of U.S.-directed flexibility allowances in each power category that have been sold in previous calendar years under the provisions of Section 2423(d) and 40 CFR 89.102(d).

(B) For each year that Tier 4 flexibility allowances are used, the equipment manufacturer shall submit, by March 31 of the following year, a written report to the Chief of the Mobile Source Operations Division, or designee, documenting the utilization of those allowances. ~~In This~~the report, the manufacturer shall ~~include~~ identify the total numbercount of equipment sold by the manufacturer during the preceding year for each power category, based on actual U.S.-directed production information, and shall identify the flexibility allowances in each power category by reporting the percentages of U.S.-directed flexibility production, and, if available, California-directed production volumes, corresponding to the number of equipment in each power category. If the manufacturer(s) of the engine installed in the equipment has not already been identified as required in §2423(d)(7)(A)4., the equipment manufacturer shall identify the name and address of this engine manufacturer(s) in the report. The report shall also identify the cumulative yearly totals and percentages for all flexibility allowances sold for each power category. Alternatively, the percentage figures may be omitted from the report if the report states that percent-of-production allowances were not used. ~~If available, end of year percentage figures for California-directed sales shall also be included in this report.~~

(8) *Import restrictions on the use of Tier 4 flexibility allowances.* Foreign equipment manufacturers may only import equipment with exempted flexibility engines into California according to the stipulations in Section 1039.626 of the 2008-2010 Test Procedures or Part I-D of the 2011 and Later Test Procedures as applicable. These stipulations address the potential for abuse whereby individual importers could collectively import more flexibility allowances than permitted based on the foreign equipment manufacturer's total production for the United States market. The stipulations include acceptance by the foreign equipment manufacturer of random audits by the ARB or its representatives, and the posting of a monetary bond for each imported engine to cover the cost of any potential enforcement actions. Foreign equipment manufacturers who comply with the stipulations will be eligible to receive the same flexibility allowances as domestic manufacturers.

(9) *Early introduction incentives for equipment manufacturers.* In addition to the equipment flexibility allowances provided in Subsections (d)(1)(C) and (d)(2)(B), equipment manufacturers, as provided in the 2008-2010 or 2011 and Later Test Procedures as applicable, may earn additional allowances for the early introduction of equipment with engines meeting the Tier 4 standards in Table 1b. Equipment manufacturers installing engines at or above 19 kW that comply with the final Tier 4 PM and NOx standards could earn one flexibility allowance for each early Tier 4 compliant engine used in its equipment. Equipment manufacturers installing engines $56 \leq kW \leq 560$ that comply with the final Tier 4 PM standard and the alternative NOx standard could earn one-half of a flexibility allowance for each early Tier 4 engine used in its equipment. Table 8, below, summarizes the incentives for the early introduction of Tier 4 compliant equipment and some of the conditions that determine eligibility. Should an equipment manufacturer decline flexibility allowances earned with this provision, the allowances would then be available to the engine manufacturer that had supplied the early introduction engine, subject to the provisions in Section 2423(b)(6).

Table 8. – Early Introduction Incentives for Equipment Manufacturers

| POWER CATEGORY | QUALIFYING STANDARDS (g/kW-hr) | INSTALLATION DEADLINE | FLEXIBILITY ALLOWANCE |
|------------------------|--|--------------------------------|-----------------------|
| $19 \leq kW < 56$ | 0.03 PM / 4.7 NMHC+NOx | December 31, 2012 ¹ | 1 for 1 |
| $56 \leq kW \leq 130$ | 0.02 PM / 0.40 NOx / 0.19 NMHC | December 31, 2011 | 1 for 1 |
| | 0.02 PM / 3.4 NOx / 0.19 NMHC ² | | 1 for 2 |
| $130 \leq kW \leq 560$ | 0.02 PM / 0.40 NOx / 0.19 NMHC | December 31, 2010 | 1 for 1 |
| | 0.02 PM / 2.0 NOx / 0.19 NMHC ² | | 1 for 2 |
| GEN > 560 | 0.03 PM / 0.67 NOx / 0.19 NMHC | December 31, 2014 | 1 for 1 |
| ELSE > 560 | 0.04 PM / 3.5 NOx / 0.19 NMHC | | |

Notes:

1 The installation date for $37 \leq kW \leq 56$ engines purchased from manufacturers choosing to opt out of the 2008 model year Tier 4 standards and instead comply with the Tier 4 standards beginning in 2012 would be December 31, 2011.

2 To be eligible, engines must meet the 0.02 g/kW-hr PM standard and the alternative NOx standards.

(e) *Recordkeeping and calculation to verify compliance.* The following shall apply to off-road equipment or vehicle manufacturers and post-manufacture marinizers who produce flexibility equipment or vehicles or marine diesel engines under both the Tier 2/3 and Tier 4 flexibility provisions of paragraph (d) of this section, except as otherwise noted:

(1) For each power category in which excepted off-road equipment or vehicles or marine diesel engines are produced, a calculation to verify compliance with the requirements of paragraph (d) of this section shall be made by the off-road equipment

or vehicle manufacturer or post-manufacture marinizer. This calculation shall be made for flexibility allowances under the Tier 2/3 program no later than December 31 of the year following the last year in which allowances are used, and as indicated in Subsection (d)(7)(B) for flexibility allowances under the Tier 4 program. The calculation shall be based on actual national production information from the subject years. If both the percent-of-production and small volume allowances have been exceeded, then the manufacturer is in violation of Section 2420(a)(3), except as provided under Subsection (d)(6) and paragraph (f) of this section.

(2) An off-road equipment or vehicle manufacturer or post-manufacture marinizer shall keep records of all off-road equipment and vehicles and marine diesel engines sold in California under the provisions of paragraph (d) of this section, for each power category in which flexibility allowances are claimed. These records shall include equipment and engine model numbers, serial numbers, engine family name, and dates of manufacture, engine rated power for Tier 2/3 flexibility engines, and maximum engine power for Tier 4 flexibility engines. In addition, the manufacturer shall keep records sufficient to demonstrate the verifications of compliance required in paragraph (e)(1) of this section and the notifications and reports specified in Section 2423(d)(7), as applicable. All records shall be kept until at least two full years for flexibility allowances under the Tier 2/3 program and five full years for flexibility allowances under the Tier 4 program after the final year in which allowances are available for each power category, and shall be made available to the Executive Officer upon request.

(f) *Economic hardship relief.* Off-road equipment and vehicle manufacturers and post-manufacture marinizers may request relief from the Executive Officer, or designee, subject to the following requirements:

(1) The application for relief must be submitted for approval to the Chief of the Mobile Source Operations Division, or designee, in writing prior to the earliest date in which the applying manufacturer would be in violation of Section 2423(b)(1). The off-road equipment or vehicle manufacturer applying for hardship relief must submit evidence for approval, showing that the following requirements have been met:

- (A) The off-road equipment or vehicle manufacturer applying for hardship relief must not be the manufacturer of the engines used in the equipment for which relief is sought. This requirement does not apply to post-manufacture marinizers.
- (B) The conditions causing the impending violation must not be substantially the fault of the applying manufacturer.
- (C) The conditions causing the impending violation must be such that the off-road equipment or vehicle manufacturer applying for hardship relief will experience serious economic hardship if relief is not granted.

(D) The off-road equipment or vehicle manufacturer applying for hardship relief must demonstrate that no allowances under paragraph (d) of this section will be available to avoid the impending violation.

(2) Any relief granted must begin within one year after the implementation date of the standard applying to the engines being used in the equipment, or to the marine diesel engines, for which relief is requested, and may not exceed 12 months (24 months for small volume manufacturers) in duration.

(3) The Executive Officer may impose other conditions on the granting of relief, including provisions to recover the lost environmental benefit. The labeling requirements in the 2008-2010 and 2011 and Later Test Procedures apply as applicable.

(g) *Alternative Flexibility for Post-Manufacture Marinizers.* Post-manufacture marinizers may elect to delay the effective date of the Tier 1 standards for marine propulsion diesel engines rated under 37kW by one year, instead of using the provisions of paragraphs (d) and (f) of this section. Post-manufacture marinizers wishing to take advantage of this provision must inform the Executive Officer of their intent to do so in writing before the date that the standards would otherwise take effect.

(h) *Allowance for the production of engines.* To meet the demand for engines created under paragraph (d), (f), or (g) of this section, engine manufacturers may produce engines that do not meet current year emission requirements. However, engine manufacturers must receive written assurance from each equipment manufacturer, prior to production, that a certain number of these engines are needed for the equipment manufacturer's Tier 4 equipment flexibility allowances. Engine manufacturers shall provide to the Executive Officer annually, as part of the certification application, a list of the equipment manufacturers requesting such engines for their Tier 2/3 and Tier 4 equipment flexibility allowances. The list shall include the equipment manufacturers' names, engine models, and estimated national production volumes. A copy of the original correspondence from the equipment manufacturer requesting the production of flexibility engines shall be kept on file by the engine manufacturer in addition to, and in accordance with, the provisions of §1039.250 of the 2008-2010 Test Procedures or Part I-D of the 2011 and Later Test Procedures, as applicable, and shall be made available without delay to the Executive Officer upon request. Furthermore, all engines produced for sale in California under either of the transitional flexibility provisions for equipment manufacturers, must be covered by an Executive Order starting January 1, 2007. To obtain an Executive Order for these engines, the engine manufacturer shall comply with the following:

- (1) Prior to the start of production, submit a letter to the Chief of the Mobile Source Operations Division, or designee, requesting certification for flexibility engines intended for sale in California, and

- (2) Provide written assurance that the flexibility engines to be produced will be identical in all material respects to those for which a valid Executive Order has been issued in a previous model year. The engine family name of the previously certified engine family must be included in the manufacturer's request for certification.

Upon determination that the conditions in paragraphs (1) and (2) have been satisfied, the Executive Officer shall provide the engine manufacturer with an Executive Order covering the requested flexibility engine families for the current model year. The engine family names included in the Executive Order shall either be the same as, or a subset of the previously certified engine family names, and shall remain the same for as long as the engines continue to qualify as flexibility allowances regardless of model year. These engine family names shall be used by the engine manufacturer to comply with the labeling requirements of 2423(d)(5)(A).

(i) [Reserved]

(j)(1) A new compression-ignition off-road engine intended solely to replace an engine in a piece of off-road equipment that was originally produced with an engine manufactured prior to the applicable implementation date as specified in Section 2423, shall not be subject to the emission requirements of Section 2423 provided that:

(A) the engine manufacturer has ascertained that no engine produced by itself or the manufacturer of the engine that is being replaced, if different, and certified to the requirements of this article, is available with the appropriate physical or performance characteristics to repower the equipment; and

(B) unless an alternative control mechanism is approved in advanced by the Executive Officer, the engine manufacturer or its agent takes ownership and possession of the engine being replaced; and

(C) the engine manufacturer does not use the replacement-engine exemption to circumvent the regulations; and

(D) the replacement engine is clearly labeled with the following language, or similar alternate language approved in advance by the Executive Officer:

If the replacement engine is built to a configuration that was not subject to any emission standards under this Article 4, add a permanent label with your corporate name and trademark and the following language:

"THIS ENGINE DOES NOT COMPLY WITH CALIFORNIA-~~AND FEDERAL~~ OFF-ROAD-~~OR ON-HIGHWAY~~ EMISSION REQUIREMENTS. SALE OR INSTALLATION OF THIS ENGINE FOR ANY PURPOSE OTHER THAN AS A REPLACEMENT ENGINE FOR AN ENGINE MANUFACTURED PRIOR TO

JANUARY 1 [~~INSERT APPROPRIATE YEAR~~Insert appropriate year reflecting when the earliest tier of emission standards began to apply to engines of that size and type] ~~IS MAY BE~~ A VIOLATION OF CALIFORNIA AND FEDERAL LAW SUBJECT TO CIVIL PENALTY.”

Beginning January 1, 2013, the following additional information shall also be included on the emission control label:

ENGINE POWER: {insert the advertised power of the specific engine configuration or the applicable power category for the engine family in kilowatts}

DATE OF MANUFACTURE: {insert the engine build date}”

In lieu of including “Engine Power” or “Date of Manufacture” on the emissions control label, manufacturers may provide this information on a supplemental label attached to the engine in accordance with the provisions of §2424.

If the replacement engine is built to a configuration that was subject to emission standards under this Article 4, add a permanent label with your corporate name and trademark and the following language:

“THIS ENGINE COMPLIES WITH CALIFORNIA OFF-ROAD EMISSION REQUIREMENTS FOR [Identify the appropriate emission standards (by model year, tier, or emission levels) for the replaced engine] ENGINES UNDER 13 CCR 2423(j). SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN TO REPLACE A [Identify the appropriate emission standards (by model year, tier, or emission levels) for the replaced engine] OFF-ROAD ENGINE MAY BE A VIOLATION OF CALIFORNIA LAW SUBJECT TO CIVIL PENALTY.

Beginning January 1, 2013, the following additional information shall also be included on the emission control label:

ENGINE POWER: {insert the certified power in kilowatts of the specific engine configuration, if applicable, otherwise insert advertised power in kilowatts}

REFERENCE FAMILY NAME: {insert the engine family name of the replacement engine as recorded in the Executive Order for the engine family to which the replacement engine was originally certified}

DATE OF MANUFACTURE: {insert the engine build date}”

In lieu of including “Engine Power,” Reference Family Name,” or “Date of Manufacture” on the emissions control label, manufacturers may provide this information on a supplemental label attached to the engine in accordance with the provisions of §2424. Manufacturers may alternately state the applicable power category in kilowatts for the certified engine family on the emission control or supplemental label when indicating “Engine Power.” Additionally, manufacturers may indicate the “Emissions Tier” of the replacement engine on the emissions control or supplemental label instead of the “Reference Family Name.” For the purpose of this section, “Emissions Tier” is the emissions standard designation (e.g., Tier 1, Tier 2, Tier 3, Tier 4i, Tier 4f) of the engine recorded in the Executive Order for the engine family to which the replacement engine was originally certified. Certified power means the configuration-specific power of the replacement engine as originally identified in the application for certification of the reference engine family (see §1039.205(a)). Advertised power means engine power as stated by the manufacturer in sales literature.

2) At the conclusion of each of the 2000 and later model years, the manufacturer must provide, by engine model, the actual number of replacement engines produced for California during the model year, and a description of the physical or performance characteristics of those models that indicate certified replacement engine(s) were not available as per paragraph (1).

(k) Any new engine certified to comply with California emission standards and test procedures for on-road applications may, upon approval by the Executive Officer, be considered to be in compliance with these regulations.

(l) *Practices and labeling requirements for rebuilt engines.* This subsection shall apply as provided in paragraph (1) below to all off-road compression-ignition engines subject to the requirements of Section 2423 that are rebuilt after December 31, 2006, including those engines that were originally manufactured on, or prior to, December 31, 2006.

(1) *Practices.* The rebuilding practices described in Part 89.130 of the incorporated 2000 Plus Limited Test Procedures, including the exemption for engines equal to or greater than 37 kW that meet the Tier 1 standard, and Part 1068.120 of the 2008-2010 Test Procedures or Part I-F of the 2011 and Later Test Procedures as applicable shall apply. These practices are summarized in paragraphs (1)(A) and (1)(B) below, which are provided as respective references for the labeling requirements in paragraphs (2)(A) and (2)(B) of this subsection.

(A) Any person who rebuilds an engine that either remains installed in a piece of equipment during the rebuilding process or will be reinstalled after the rebuilding process has been completed shall rebuild the engine to the same certified configuration or the certified configuration of a later model year engine. For the purposes of this section, these engines shall be referred to as “rebuilt original engines.”

(B) Any person who replaces the engine in a piece of equipment with a rebuilt engine (this includes engines that have been substantially assembled from parts originally belonging to one or more other engines) shall use a replacement engine with a certified configuration that is at least equivalent, from an emissions standpoint, to that of the engine being replaced. For the purposes of this section, these engines shall be referred to as “rebuilt replacement engines.”

(2) *Labeling Requirements.*

(A) Rebuilt Original Engines. Any person who rebuilds engines for which the practices in paragraph (1)(A) of this subsection apply shall ensure that the rebuilt engines are labeled as follows:

1. An original engine that is rebuilt to the same emissions configuration employed by the engine at the time it was issued an Executive Order shall retain the emissions control label described in Section 2424. The rebuilder shall not remove or deface in any manner the original label and must take care to protect it from the effects of sandblasting, acid dipping, or any other restorative processes. Notwithstanding the preceding requirements and prohibitions of this paragraph (2)(A)1., the rebuilder shall substitute a new permanent label containing the text in paragraph (2)(A)2. below for the original emission control label if the rebuilder determines that the label has been irreparably corrupted due to extreme and unintentional circumstances (e.g., fire or collision). The rebuilder shall provide to the Executive Officer annually a list of all rebuilt engines for which original labels have been removed under this provision no later than two months after the end of each calendar year. The rebuilder shall retain all removed labels, or otherwise document the degree to which the labels were damaged or missing (e.g., photographic proof of the corruption), for a period of no less than eight years following the date of renovation, and shall make these available to the Executive Officer upon request. The rebuilder shall be subject to civil penalty under State law should the Executive Officer determine that the original emission control label did not warrant replacement or that the rebuilder is abusing this provision;

2. An original engine that is rebuilt to a more stringent emissions configuration shall be permanently re-labeled using the following text:

“THIS ENGINE HAS BEEN REBUILT UNDER 13 CCR 2423(I) USING MATCHED COMPONENTS OF THE SAME SPECIFICATIONS AND CALIBRATIONS AS THOSE OF A CERTIFIED TIER [*insert the numerical tier designation of the rebuilt engine*] OFF-ROAD COMPRESSION-IGNITION ENGINE. IF PLACED INTO SERVICE IN AN OFF-ROAD APPLICATION, THIS ENGINE MUST BE INSTALLED IN EQUIPMENT ORIGINALLY SOLD WITH A TIER [*insert the numerical tier designation of the rebuilt engine*] OR EARLIER ENGINE. [*insert the engine family name of the reference engine*].”

For the purpose of this label, "MATCHED" means a complete set of components corresponding to the certified emissions configuration being referenced (see the definition of "certified emissions configuration" in Section 2421(a)(13)). The reference engine is the engine family name corresponding to the certified emissions configuration to which the engine has been rebuilt. The label shall conform to the provisions of Section 2424 regarding location and visibility.

(B) Rebuilt Replacement Engines. Any person who rebuilds engines for which the practices in paragraph (1)(B) of this subsection apply shall ensure that the rebuilt engines are labeled as follows:

1. A replacement engine that is rebuilt to the same California emissions configuration employed by the engine at the time it was issued an Executive Order shall either retain the emission control label described in Section 2424 or be permanently re-labeled using the text in paragraph (2)(A)2 of this subsection. A replacement engine that is rebuilt to the same emissions configuration employed by the engine at the time it was issued a federal Certificate of Conformity, and for which no Executive Order exists, shall be permanently re-labeled using the text in paragraph (2)(A)2 of this subsection. prior to being installed in equipment that was originally sold with a California certified engine;

2. A replacement engine that is rebuilt to a more stringent emissions configuration shall be permanently re-labeled using the text in paragraph (2)(A)2. above;

3. An incomplete rebuilt replacement engine shall be permanently re-labeled using the text specified below. For the purposes of this subsection, "incomplete rebuilt replacement engine" means a rebuilt replacement engine that is sold or offered for sale in California without all the necessary components to enable engine operation including, but not necessarily limited to, the fuel system and the air system:

"THIS ENGINE HAS BEEN REBUILT UNDER 13 CCR 2423(l) AS AN INCOMPLETE ENGINE USING ONLY MATCHED COMPONENTS OF THE SAME SPECIFICATIONS AND CALIBRATIONS AS THOSE FOUND IN OFF-ROAD COMPRESSION-IGNITION ENGINES CERTIFIED TO THE [*insert the numerical tier or multiple tiers designation of the rebuilt engine*]."

Any person who completes an incomplete rebuilt replacement engine with components that are not matched components, and the resulting engine is placed into service in California, is in violation of the rebuilding practices referenced under paragraph (1) of this subsection and subject to civil penalty under State law.

(C) Supplemental Labeling Requirements. Except as noted below, any person who sells or offers for sale any rebuilt engine subject to the provisions of subsection (l) shall affix a supplemental label to the rebuilt engine that:

1. states the name of the rebuilder, year of rebuild, and other pertinent information as determined by the rebuilder or specified by the Executive Officer; and
2. is clearly visible without the need to remove any engine components; and
3. does not obscure in any way the visibility of the original emission control label or the labels required under paragraphs (2)(A)2. or (2)(B)3. of this subsection; and
4. does not state or imply that the rebuilt engine is “new” or that it belongs to an engine family other than the one to which it was originally certified; and
5. has sufficient durability to remain intact and legible throughout all mandatory record keeping periods for rebuilt engines.

The requirement for a supplemental label shall be waived in cases where the rebuilder alternately chooses to incorporate the information in (C)1. above into the new permanent label specified in subsection (2)(A)2. or (2)(B)3.

(D) Rebuilt New Engines. Notwithstanding any other requirement of this subsection (I), any person who rebuilds an engine to comply with current-year emission requirements (including, but not limited to, durability and warranty), with the intent to sell or offer for sale the rebuilt engine as “new” under the coverage of a new and unique Executive Order, shall replace the original emission control label on that engine with one identifying the engine as belonging to a family meeting current-year emission requirements in accordance with the provisions of Section 2424. If desired, the rebuilder of a such an engine may optionally affix to it a supplemental label, but such a label would be required to comply with the same requirements specified in paragraph (C) of this subsection for any other rebuilt engine.

(m) Stockpiling prohibition. Manufacturers may not circumvent the provisions of this article by stockpiling engines with a date of manufacture preceding new or changed emission standards by deviating from normal production and inventory practices. For purposes of this paragraph (m), normal production and inventory practices means those practices typically employed for similar engine families in years in which emission standards do not change. The Executive Officer may request the submission of routine production and inventory records from manufacturers that document normal practices for up to eight years to aid in determining whether or not a violation of this section has occurred. Other stockpiling prohibitions in §1068.103 and §1068.105 of the 2011 and Later Test Procedures, Part I-E, apply.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101 and 43104, Health and Safety Code. Reference: Sections 43013, 43017, 43018, 43101, 43104 and

43211-43212, Health and Safety Code.

§ 2424. Emission Control Labels — 1996 and Later Off-Road Compression-Ignition Engines

(a) *Purpose.* The Air Resources Board recognizes that certain emissions-critical or emissions-related parts must be properly identified and maintained in order for engines to meet the applicable emission standards. The purpose of these specifications is to require engine manufacturers to affix a label (or labels) on each production engine (or equipment) to provide the engine or equipment owner and service mechanic with information necessary for the proper maintenance of these parts in customer use.

(b) *Applicability.*

(1) These specifications shall apply to 1996-1999 model year heavy-duty off-road compression-ignition engines, which have been certified to the applicable emission standards pursuant to Health and Safety Code Section 43013.

(2) These specifications shall apply to 2000 and later model year compression-ignition engines, which have been certified to the applicable emission standards pursuant to Health and Safety Code Section 43013.

(3) Engine manufacturers who have certified such engines shall be responsible for complying with these specifications.

(c) *Label Content and Location.*

(1) For 1996-1999 heavy-duty off-road compression-ignition engines:

(A) A tune-up label shall be permanently attached to the engine block or other major component in such a way that it will be readily visible after installation of the engine in the equipment. If the equipment obscures the label on the engine, the equipment manufacturer shall attach a supplemental label such that it is readily visible.

(B) In selecting an acceptable location, the manufacturer shall consider the possibility of accidental damage (e.g., possibility of tools or sharp instruments coming in contact with the label). Each label shall be affixed in such a manner that it cannot be removed without destroying or defacing the label, and shall not be affixed to any part which is likely to be replaced during the equipment's useful life. The label(s) shall not be affixed to any component which is easily detached from the engine.

(C) In addition, an engine serial number shall be stamped on the engine block or stamped on a metal label riveted to the engine block. Engine manufacturers shall keep records such that the engine serial number can easily be used to determine if an engine was certified for the applicable model year.

(D) The label shall be in the English language and use block letters and numerals which shall be of a color that contrasts with the background of the label.

(E) The label shall contain the following information:

1. The label heading shall read:

“Important Engine Information.”

2. Full corporate name and trademark of the manufacturer.

3. “This (specify equipment or engine, as applicable) is certified to operate on (specify operating fuel(s)).”

4. *Identification of the Exhaust Emission Control System.* Abbreviations may be used and shall conform to the nomenclature and abbreviations found in the Society of Automotive Engineers document J1930 which is incorporated by reference herein [in Section 1977, Title 13, CCR], titled “Diagnostic Acronyms, Terms, and Definitions for Electrical/Electronic Systems.”

5. The specifications and adjustments recommended by the manufacturer, including, if applicable: initial injection timing, and fuel rate (in mm³/stroke) at advertised horsepower. These specifications shall indicate the proper transmission position, (if applicable), during tune-up and what accessories, if any, should be in operation, and what systems, if any (e.g., vacuum advance, air pump), should be disconnected during the tune-up. If the manufacturer does not recommend adjustment of the foregoing specifications, the manufacturer shall include in lieu of the “specifications” the single statement “No other adjustments needed.” For all engines, the instructions for tune-up adjustments shall be sufficiently clear on the label to preclude the need for a mechanic or equipment owner to refer to another document in order to correctly perform the adjustments.

6. An unconditional statement of compliance with the appropriate model year California regulations; for example, “This engine conforms to 1996 California regulations for heavy-duty off-road diesel cycle engines as applicable.”

7. Total engine displacement (in cubic centimeters, liters, or cubic inches) and engine family identification.

(F)1. The manufacturer of any engine certified with a clean fuel (i.e., low-sulfur diesel fuel) shall at the time of engine manufacture, affix a permanent legible label specifying the appropriate operating fuel(s).

2. The label shall be located immediately adjacent to each fuel tank filler inlet and outside of any filler inlet compartment. It shall be located so that it is readily

visible to any person introducing fuel to such filler inlet; Provided, however, that the Executive Officer shall upon application from an engine manufacturer, approve other label locations that achieve the purpose of this paragraph. If the engine is manufactured separately from the equipment, the label shall be affixed to the engine and located so that it is readily visible. Such labels shall be in English and in block letters, which shall be of a color that contrasts with their background.

(2) For 2000 and later Tier 1, Tier 2, and Tier 3 off-road compression-ignition engines, the label content and location must comply with the requirements in Section 89.110 of the 2000 ~~and Later~~ Plus Limited Test Procedures.

(3) For 2008 and Later Tier 4 off-road compression-ignition engines, the label content and location must comply with the requirements in Section 1039.135 of the 2008 ~~2010 Test Procedures or Part I-D of the 2011~~ and Later test Procedures as applicable.

(d) The provisions of these specifications shall not prevent a manufacturer from also stating on the label that such engine or equipment conforms to any applicable federal emission standards for new engines, or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the equipment or engine.

(e) As used in these specifications, readily visible to the average person shall mean that the label shall be readable from a distance of eighteen inches (46 centimeters) without any obstructions from equipment or engine parts (including all manufacturer available optional equipment) except for flexible parts (e.g., vacuum hoses, ignition wires) that can be moved out of the way without disconnection. Alternatively, information required by these specifications to be printed on the label shall be no smaller than 8 point type size provided that no equipment or engine parts (including all manufacturer available optional equipment), except for flexible parts, obstruct the label.

(f) The labels and any adhesives used shall be designed to withstand, for the engine's or equipment's total expected life, typical equipment environmental conditions in the area where the label is attached. Typical equipment environmental conditions shall include, but are not limited to, exposure to engine fuels, lubricants and coolants (e.g., diesel fuel, motor oil, water, ethylene glycol). The manufacturer shall submit, with its certification application, a statement attesting that its labels comply with these requirements.

(g) The manufacturer shall obtain approval from the Executive Officer for all label formats and locations prior to use. Approval of the specific maintenance settings is not required; however, the format for all such settings and tolerances, if any, is subject to review. If the Executive Officer finds that the information on the label is vague or subject to misinterpretation, or that the location does not comply with these

specifications, he or she may require that the label or its location be modified accordingly.

(h) Samples of all actual labels used within an engine family shall be submitted to the Executive Officer within thirty days after the start of production.

(i) The Executive Officer may approve alternate label locations or may, upon request, waive or modify the label content requirements provided that the intent of these specifications is met.

(j) The manufacturer of any engine shall furnish to the Executive Officer, at the beginning of the model year, any engine identification number coding system which identifies whether such engine(s) are covered by an Executive Order.

(k) If the Executive Officer finds any engine (or equipment) manufacturer using labels which are different from those approved or which do not substantially comply with the readability or durability requirements set forth in these specifications, the manufacturer shall be subject to being enjoined from any further sales of such products in the State of California pursuant to Section 43017 of the Health and Safety Code. Prior to seeking to enjoin a manufacturer, the Executive Officer shall consider any information provided by the manufacturer.

(l) An emission control information label shall not be altered or removed from an engine, subject to civil penalty under State law, except that a dealer or distributor may remove an incorrect label, prior to the transfer of title of the engine to an ultimate purchaser, and replace the incorrect label with the correct label supplied by the certifying manufacturer or an authorized agent. For the purpose of this section, an incorrect label means an emission control information label that was affixed to an engine in good faith by the certifying manufacturer or authorized agent, but which fails to accurately describe the engine's emission performance as required under this Article due to unintentional or clerical error. In this context, good faith means an honest intent to act without seeking to gain an unfair advantage or to circumvent the regulations. Notwithstanding, an emission control label may be removed and replaced according to the labeling provisions for rebuilt engines in §2423(l). For new replacement engines manufactured in accordance with the provisions of §2423(j), a dealer or distributor may affix supplemental labels, prior to the transfer of title of the engine to an ultimate purchaser, as allowed in §2423(j)(1). Other provisions in §1068.101(b)(7) of the 2011 and Later Test Procedures, Part I-E, may also apply.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code. Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104 and 43105, Health and Safety Code.

§ 2425. Defects Warranty Requirements for 1996 and Later Off-Road Compression-Ignition Engines.

(a) *Applicability.* This section shall apply to new 1996-1999 model year heavy-duty off-road compression-ignition engines and new 2000 and later model year compression-ignition engines. For 2011 and later model year compression-ignition engines the requirements in §1039.120 and §1039.125 of the 2011 and Later Test Procedures, Part I-D, shall also apply. The warranty period shall begin on the date the engine or equipment is delivered to an ultimate purchaser. The use of alternative fuels shall not void the warranties on any engine certified to use such fuel.

(b) *General Emissions Warranty Coverage.* The manufacturer of each off-road compression-ignition engine shall warrant to the ultimate purchaser and each subsequent purchaser that the engine is:

(1) Designed, built, and equipped so as to conform with all applicable regulations adopted by the Air Resources Board pursuant to its authority in Chapters 1 and 2, Part 5, Division 26 of the Health and Safety Code; and

(2) Free from defects in materials and workmanship which cause the failure of a warranted part to be identical in all material respects to the part as described in the engine manufacturer's application for certification for a period of five years or 3,000 hours of operation, whichever occurs first, for all engines rated at 19kW and greater, except as noted below. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years. For all engines rated less than 19kW, and for constant-speed engines rated under 37kW with rated speeds higher than or equal to 3,000 rpm, the period of two years or 1,500 hours of operation, whichever occurs first, shall apply. In the absence of a device to measure hours of use, the engine shall be warranted for a period of two years.

(c) The warranty on emissions-related parts shall be interpreted as follows:

(1) Any warranted part which is not scheduled for replacement as required maintenance in the written instructions required by Subsection (e) shall be warranted for the warranty period defined in Subsection (b)(2). If any such part fails during the period of warranty coverage, it shall be repaired or replaced by the engine manufacturer according to Subsection (4) below. Any such part repaired or replaced under the warranty shall be warranted for the remaining warranty period.

(2) Any warranted part which is scheduled only for regular inspection in the written instructions required by Subsection (e) shall be warranted for the warranty period defined in Subsection (b)(2). A statement in such written instructions to the effect of "repair or replace as necessary" shall not reduce the period of warranty coverage. Any such part repaired or replaced under warranty shall be warranted for the remaining warranty period.

(3) Any warranted part which is scheduled for replacement as required maintenance in the written instructions required in Subsection (e) shall be warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part shall be repaired or replaced by the engine manufacturer according to Subsection (4) below. Any such part repaired or replaced under warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for the part.

(4) Repair or replacement of any warranted part under the warranty provisions of this article shall be performed at no charge to the owner at a warranty station.

(5) Notwithstanding the provisions of Subsection (4) above, warranty services or repairs shall be provided at all manufacturer distribution centers that are franchised to service the subject engines.

(6) The owner shall not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at a warranty station.

(7) The engine manufacturer shall be liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.

(8) Throughout the engine's warranty period defined in Subsection (b)(2), the engine manufacturer shall maintain a supply of warranted parts sufficient to meet the expected demand for such parts.

(9) Any replacement part, as defined in Section 1900(b)(13), Title 13, may be used in the performance of any maintenance or repairs and must be provided without charge to the owner. It is not necessary for replacement parts to be the same brand or by the same manufacturer as the original part sold with the engine. Such use shall not reduce the warranty obligations of the engine manufacturer.

(10) Add-on or modified parts, as defined in Section 1900(b)(1) and (b)(10), Title 13, that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts shall be grounds for disallowing a warranty claim made in accordance with this article. The engine manufacturer shall not be liable under this article to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

(11) The Executive Officer may request and, in such case, the engine manufacturer shall provide, any documents which describe that manufacturer's warranty procedures or policies.

(d) Each manufacturer shall include a copy of the following emission warranty parts list with each new engine, using those portions of the list applicable to the engine.

- (1) Fuel Metering System
 - (A) Fuel injection system.
 - (B) Air/fuel ratio feedback and control system.
 - (C) Cold start enrichment system.
- (2) Air Induction System
 - (A) Controlled hot air intake system.
 - (B) Intake manifold.
 - (C) Heat Riser Valve and Assembly.
 - (D) Turbocharger/Supercharger Systems.
 - (E) Charge Air Cooling Systems.
- (3) Exhaust Gas Recirculation (EGR) System
 - (A) EGR valve body, and carburetor spacer if applicable.
 - (B) EGR rate feedback and control system.
- (4) Air injection System
 - (A) Air pump or pulse valve.
 - (B) Valves affecting distribution of flow.
 - (C) Distribution manifold.
- (5) Catalyst or Thermal Reactor System
 - (A) Catalytic converter.
 - (B) Thermal reactor.
 - (C) Exhaust manifold.
- (6) Particulate Controls
 - (A) Traps, filters, precipitators, and any other device used to capture particulate emissions.
 - (B) Regenerators, oxidizers, fuel additive devices, and any other device used to regenerate or aid in the regeneration of the particulate control device.
 - (C) Control Device Enclosures and Manifolding.
 - (D) Smoke Puff Limiters.
- (7) Advanced Oxides of Nitrogen (NOx) Controls
 - (A) NOx Adsorbers
 - (B) Lean NOx Catalysts
 - (C) Selective Catalyst Reduction
 - (D) Reductant (urea/fuel) containers/dispensing systems
- (8) Positive Crankcase Ventilation (PCV) System.
 - (A) PCV Valve.
 - (B) Oil Filler Cap.
- (9) Miscellaneous items Used in Above Systems
 - (A) Vacuum, temperature, and time sensitive valves and switches.
 - (B) Electronic control units, sensors, solenoids, and wiring harnesses.

- (C) Hoses, belts, connectors, assemblies, clamps, fittings, tubing, sealing gaskets or devices, and mounting hardware.
- (D) Pulleys, belts and idlers.
- (E) Emission Control Information Labels.
- (F) Any other part with the primary purpose of reducing emissions or that can increase emissions during failure without significantly degrading engine performance.

(e) Each manufacturer shall furnish with each new engine written instructions for the maintenance and use of the engine by the owner. The instructions shall be consistent with this article and applicable regulations contained herein.

(f) Each manufacturer shall submit the documents required by Subsections (d) and (e) with the manufacturer's preliminary application for engine certification for approval by the Executive Officer. Approval by the Executive Officer of the documents required by Subsections (d) and (e) shall be a condition of certification. The Executive Officer shall approve or disapprove the documents required by Subsections (d) and (e) within 90 days of the date such documents are received from the manufacturer. (Title 17, California Code of Regulations (CCR), Section 60030.) Any disapproval shall be accompanied by a statement of the reasons therefore. In the event of disapproval, the manufacturer may file for an adjudicative hearing pursuant to Title 17, California Code of Regulations Division 3, Chapter 1, Subchapter 1.25, Articles 1 and 2, to review the decision of the Executive Officer.

(g) In the application, each manufacturer shall include a statement concerning proper maintenance of the engine to maximize emissions performance. The statement shall include, but not be limited to, information on air filter care and replacement schedule, proper fueling and fuel mixing, engine maintenance, and a maintenance schedule to ensure that the owner returns to a servicing center to check for deposits, debris build-up, etc.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 43104 and 43105, Health and Safety Code. Reference: Sections 43013, 43017, 43018, 43101, 43102 and 43205.5, Health and Safety Code.

§ 2425.1 Defect Investigation and Reporting Requirements.

(a) *Applicability.* This section shall apply to new off-road compression-ignition engines subject to the standards in Section 2423 (b)(1)(B) and the incorporated ~~2008-2010 or 2011~~ and Later Test Procedures as applicable, and shall address defects for any of the emission-related components, or systems containing the components listed in Section 2425(d)(1).

(b) *General requirements.* Engine manufacturers shall investigate their engines that have been introduced into commerce in California for incorrect, improperly installed, or otherwise defective emission-related components or systems, and shall submit a report to the ARB based on federal triggering thresholds documenting these activities, as required, and their findings. If available, California-specific incidence rates shall also be included in this report.

(c) *Investigation and reporting procedures.* Engine manufacturers shall perform the investigation and reporting procedures specified in Part 1068, Subpart F of the ~~2008-2010 Test Procedures or Part I-E of the 2011~~ and Later Test Procedures as applicable.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 43104 and 43105, Health and Safety Code. Reference: Sections 43013, 43017, 43018, 43101, 43102 and 43205.5, Health and Safety Code.

§ 2426. Emission Control System Warranty Statement.

(a) Each manufacturer shall furnish a copy of the following statement with each new 1996-1999 model year heavy-duty off-road compression-ignition engine and each new 2011 and later model year compression-ignition engine, using those portions of the statement applicable to the engine.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The **California Air Resources Board** (and manufacturer's name, optional) is pleased to explain the **emission control system warranty** on your **(year)** engine. In California, new heavy-duty off-road engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. (Manufacturer's name) must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel-injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, (manufacturer's name) will repair your heavy-duty off-road engine at no cost to you including diagnosis, parts, and labor.

MANUFACTURER'S WARRANTY COVERAGE:

The **(year)** and later heavy-duty off-road engines are warranted for **(warranty period)**. If any emission-related part on your engine is defective, the part will be repaired or replaced by (manufacturer's name).

OWNER'S WARRANTY RESPONSIBILITIES:

- As the ~~heavy-duty~~ off-road engine owner, you are responsible for the performance of the **required maintenance listed in your owner's manual**. (Manufacturer's name) recommends that you retain all receipts covering maintenance on your ~~heavy-duty~~ off-road engine, but (manufacturer's name) cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- As the ~~heavy-duty~~ off-road engine owner, you should however be aware that (manufacturer's name) may deny you warranty coverage if your ~~heavy-duty~~ off-road engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

- Your engine is designed to operate on (fuel) only. Use of any other fuel may result in your engine no longer operating in compliance with California's emissions requirements.
- You are responsible for initiating the warranty process. The ARB suggests that you present your **heavy-duty** off-road engine to a (manufacturer's name) dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible.

If you have any questions regarding your warranty rights and responsibilities, you should contact (Insert chosen manufacturer's contact) at **1-XXX-XXX-XXXX**.

(b) For 1996-1999 model year heavy-duty off-road compression-ignition engines and 2011 and later model year compression-ignition engines, each manufacturer shall furnish with each new engine a warranty statement which generally describes the obligations and rights of the engine manufacturer and owner under this article. Engine manufacturers shall also include in the warranty statement a phone number the customer may use to obtain their nearest franchised service center.

(c) Each manufacturer shall submit the documents required by Subsections (a) and (b) with the manufacturer's preliminary application for new engine certification for approval by the Executive Officer. The Executive Officer may reject or require modification of the documents to the extent the submitted documents do not satisfy the requirements of Subsections (a) and (b). Approval by the Executive Officer of the documents required by Subsections (a) and (b) shall be a condition of certification. The Executive Officer shall approve or disapprove the documents required by Subsections (a) and (b) within 90 days of the date such documents are received from the manufacturer. Any disapproval shall be accompanied by a statement of the reasons therefore. In the event of disapproval, the manufacturer may petition the Board to review the decision of the Executive Officer.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code. Reference: Sections 43013, 43017, 43018, 43101, 43102 and 43205.5, Health and Safety Code.

§ 2427. Production Engine Testing, Selection, Evaluation, and Enforcement Action.

(a) Compliance Test Procedures.

(1) These procedures are applicable to the 1996-1999 model year heavy-duty off-road compression-ignition engine family groups (as defined in Sections 3 and 11 of the 1996-1999 Heavy-Duty Test Procedures) or any subgroups within an engine family group selected for compliance testing pursuant to this section.

(2) The Executive Officer may, with respect to any new engine family group or subgroup being sold, offered for sale, or manufactured for sale in California, order an engine manufacturer to make available for compliance testing and/or inspection a reasonable number of engines, and may direct that the engines be delivered to the state board at the Haagen-Smit Laboratory, 9528 Telstar Avenue, El Monte, California or where specified by the Executive Officer. The Executive Officer may also, with respect to any new engine family group or subgroup being sold, offered for sale, or manufactured for sale in California, have a manufacturer compliance test and/or inspect a reasonable number of engines at the manufacturer's facility under the supervision of an ARB Enforcement Officer. Engines shall be representatively selected from sources specified by the Executive Officer according to a method approved by him/her, which insofar as practical shall exclude engines which would result in an unreasonable disruption of the manufacturer's distribution system. To the extent practical, the Executive Officer shall test a representative configuration (as defined in the 1996-1999 Heavy-Duty Test Procedures) from the engine family group in order to minimize manufacturers' expense and inconvenience in testing different engine configurations.

A subgroup of an engine family group may be selected for compliance testing only if the Executive Officer has reason to believe that the emissions characteristics of that subgroup are substantially in excess of the evaluation of the emissions of the engine family group as a whole.

(3) For all 1996-1999 heavy-duty off-road compression-ignition engines selected for compliance testing, the selection and testing of engines and the evaluation of data shall be made in accordance with the procedures set forth herein.

(4) For manufacturers that have more than one engine family group, the Air Resources Board or its designated laboratory shall procure and test at the manufacturer's expense no more than one engine family group per year, if compliance testing is required.

Notwithstanding the above, if a manufacturer fails to demonstrate compliance with the emission standards after one engine family group has been tested, the ARB or its designated laboratory may test additional engine family groups at the manufacturer's expense, until compliance is demonstrated on one engine family group or all of a

manufacturer's engine family groups have been tested. However, the ARB may conduct engine enforcement testing pursuant to the engine test procedures specified in Section 2423, at its own expense. In such an instance, the Executive Officer shall order testing only in those cases where evidence such as quality audit test data or in-use test data indicate that engines may not be in compliance.

(5) All testing shall be conducted in accordance with the applicable model year certification emission test procedures. Break-in before testing may be performed on test engines to the same extent it is performed on assembly-line quality audit testing engines (See Subsection (b)). No break-in or modifications, adjustments, or special preparation or maintenance will be allowed on engines chosen for compliance testing without the written consent of the Executive Officer. Such consent shall not be unreasonably withheld where such adjustment or alteration is required to render the engine testable and reasonably operative.

(6) If the manufacturer elects to specify a different break-in or adjustments, they will be performed by the manufacturer under the supervision of ARB personnel.

(7) Correction of damage or maladjustment which may reasonably be found to have resulted from shipment of the engine is permitted only after testing the engine, except where 100 percent of the manufacturer's production is given that inspection or maintenance by the manufacturer's own personnel. Exceptions are allowed in the cases where the damage results in the engine being unsafe to operate, inoperable, or unable to complete the emission test. Additionally, an exception is allowed if the damage results in engine performance deficiencies which would be obvious in customer service and which would cause the customer to seek repair of the engine. The manufacturer may request that the engine be repaired from shipping damage, and be retested. If the Executive Officer concurs, the engine may be retested, and the original test results may be replaced by the after-repair test results.

(8) Engines shall be representatively chosen from the selected engine family group or subgroup. Manufacturers shall indicate which sampling plan (as described in paragraphs (9) and (10), below) they prefer to use prior to the start of testing. Once testing has begun, manufacturers may not switch to the other sampling plan; the generated test results will be final. Each chosen engine shall be tested according to the 1996-1999 Heavy-Duty Test Procedures to determine its emissions. Unique specialty hardware and personnel normally necessary to prepare the engine for the performance of the test as set forth in the applicable test procedures shall be supplied by the manufacturer within seven days after request. Failure to supply this unique specialty hardware or personnel may not be used by the manufacturer as a cause for invalidation of the subsequent tests.

(9) *Primary Sampling Plan.*

(A) Engines shall be tested in groups of five until a "Pass" or "Fail" decision is reached for each pollutant independently for the engine family group or subgroup in accordance with the following table:

| <i>Number of Engines Tested</i> | <i>Decide "Fail" If "U" is greater than or equal to</i> | <i>Decide "Pass" If "U" is less than or equal to</i> |
|---------------------------------|---|--|
| 5 | 2.18 | -0.13 |
| 10 | 2.11 | 0.51 |
| 15 | 2.18 | 0.88 |
| 20 | 2.29 | 1.16 |

where:

$$U = \frac{\sum_{i=1}^n (x_i - \mu_0)}{\sqrt{\sum_{i=1}^n (x_i - \mu_0)^2}} \cdot \frac{1}{\sqrt{n}}$$

U = _____

$$\sqrt{\sum_{i=1}^n (x_i - \mu_0)^2}$$

x_i = the projected emissions of one pollutant for the i th engine tested.

μ_0 = the applicable model year emission standard for that pollutant.

n = the number of engines tested.

(B) The Executive Officer shall find that a group of engines has failed the compliance testing pursuant to the above table if he or she finds that the average emissions of the engines within the selected engine family group or subgroup exceed the applicable model year new engine emission standard for at least one pollutant.

(C) If no decision can be reached after 20 engines have been tested, the Executive Officer shall not make a "Fail" decision for the selected engine family group or subgroup on the basis of these 20 tests alone. Under these circumstances the Executive Officer shall elect to test 10 additional engines. If the average emissions from the 30 engines tested exceed any one of the exhaust emission standards for which a "Pass" decision has not been previously made, the Executive Officer shall render a "Fail" decision.

(10) *Alternate Sampling Plan for Low Volume Engine Family Groups.*

Any manufacturer subject to new engine compliance testing on an engine family group with a sales volume of less than 2000 engines per year may use the alternative sampling and testing schedule below.

| <i>Number of Engines Tested</i> | <i>Decide "Fail" If number of failed engines is greater than or equal to</i> | <i>Decide "Pass" If number of failed engines is less than or equal to</i> |
|---------------------------------|--|---|
| 1 | No Failure Decision | No Passing Decision |
| 2 | No Failure Decision | 0 |
| 3 | 3 | 0 |
| 4 | 4 | 1 |
| 5 | 4 | 1 |
| 6 | 5 | 2 |
| 7 | 5 | 2 |
| 8 | 6 | 3 |
| 9 | 6 | 4 |
| 10 | 6 | 5 |

(11) If the Executive Officer determines, in accordance with the procedures set forth herein, that an engine family group, engine family, or any subgroup within an engine family exceeds the emission standards for one or more pollutants, the manufacturer may be subject to being enjoined from any further sales of such products in the State of California pursuant to Section 43017 of the Health and Safety Code. Prior to seeking to enjoin a manufacturer, the Executive Officer shall consider quality audit test results, if any, and any additional test data or other information provided by the manufacturers.

(12) Engines selected for inspection shall be checked to verify the presence of those emissions-related components specified in the manufacturer's application for certification, and for the accuracy of any adjustments, part numbers and labels specified in that application. If any engine selected for inspection fails to conform to any applicable law in Part 5 (commencing with Section 43000) of Division 26 of the Health and Safety Code, or any regulation adopted by the state board pursuant thereto, other than an emissions standard applied to new engines to determine "certification" as specified in Chapter 9, the Executive Officer shall notify the manufacturer and may seek to enjoin the manufacturer from any further sales of such products in the State of California pursuant to Section 43017 of the Health and Safety Code. Prior to seeking to enjoin a manufacturer, the Executive Officer shall consider any information provided by the manufacturer.

(b) *Quality-Audit Test Procedures.*

(1) The 1996-1999 model year heavy-duty off-road compression-ignition engines certified for sale in California shall be subject to the Quality-Audit requirements specified herein. Each manufacturer shall use the quality-audit test procedures specified herein.

(2) These procedures specify the quality-audit test procedures in conjunction with the 1996-1999 Heavy-Duty Test Procedures. An engine is in compliance with these quality-audit standards and test procedures only when all portions of these quality-audit test procedures are fulfilled.

(3) Air Resources Board (ARB) personnel and mobile laboratories shall have access to engine or equipment assembly plants, distribution facilities, and test facilities for the purpose of engine selection, testing, and observation. Scheduling of access shall be arranged with the designated manufacturer's representative and shall not unreasonably disturb normal operations (See Section 6 of the 1996-1999 Heavy-Duty Test Procedures).

(4) Applicability.

These procedures shall apply to all certified 1996-1999 model year heavy-duty off-road compression-ignition engine family groups.

If a manufacturer cannot provide actual California sales data, it shall provide its total production and an estimate of California sales. The manufacturer shall also provide supporting material for its estimate.

(5) Engine Sample Selection.

For each family group with California sales volumes of 150 units or more per year, the manufacturer shall select for quality audit testing a representative sample of three engines or one percent of production, whichever is greater, from the highest sales volume engine family within the entire engine family group. For engine family groups with California sales volumes of less than 150 units per year, no testing shall be required unless requested by the Executive Officer based upon information and belief that such engine family groups are in noncompliance with applicable regulations. Each selected engine for quality-audit testing must pass the inspection test, by being equipped with the appropriate emission control systems certified by the ARB. The procedure for selecting engines must be submitted to the Chief, Mobile Source Division, 9528 Telstar Avenue, El Monte, CA, 91731, prior to the start of production for the 1996 model year.

(6) Engine Preparation and Preconditioning.

(A) The engine shall be tested after the manufacturer has determined that the emissions have stabilized. Engine manufacturers shall report the break-in schedule used on each test engine.

The manufacturer shall submit to the Executive Officer the schedule for hours of use accumulation or engine run-in and any changes to the schedule with each quarterly report.

(B) If an engine is shipped to a remote facility for quality-audit testing, and adjustment or repair is necessary because of such shipment, the manufacturer shall perform the necessary adjustments or repairs only after the initial test of the engine. Exceptions are allowed in the cases where the damage results in the engine being unsafe to operate, inoperable, or unable to complete the emission test. Additionally, an exception is allowed if the damage results in engine performance deficiencies which would be obvious in customer service and which would cause the customer to seek repair of the engine.

Manufacturers shall report to the Executive Officer in the quarterly report, all adjustments or repairs performed on engines prior to each test. In the event a retest is performed, an application may be made to the Executive Officer, within ten days of the emission test, for permission to substitute the after-repair test results for the original test results. When requested by the manufacturer, the Executive Officer will either affirm or deny the application within ten working days from receipt of the request.

(C) If a manufacturer determines that the emission test results of an engine are invalid, the engine must be retested. Emission results from all tests shall be reported. The manufacturer shall include a detailed report on the reasons for each invalidated test in the quarterly report.

(7) Quality-Audit Engine Selection Criteria.

(A) Engines shall be representatively selected.

(B) At the end of each calendar quarter, all of the data accumulated during the quarter shall be reported to the Executive Officer. Upon accumulation of sufficient data, the compliance of the engine family group with the emission standards is determined.

(8) Standards and Test Procedures; Evaluation.

The exhaust sampling and analytical procedures shall be those described in the 1996-1999 Heavy-Duty Test Procedures. An engine family group is considered to have failed the quality audit test if the average emissions do not comply with the applicable certification standards. Any corrective action to bring the engines into compliance with the standards must be applied to all engines in the engine family group reasonably expected to be in noncompliance based on the audit data and other relevant information.

(9) Reports.

Each engine manufacturer shall submit a report to the ARB within 45 calendar days of the end of each calendar quarter and of the model year. More frequent reports may be required if the Executive Officer invokes this section at the end of each month. Each engine manufacturer shall review the test results of each engine family group at the end of each month.

The quarterly report shall include the following:

(A) The total production and sample size for each engine family group.

(B) A description of each test engine (i.e., date of test, engine family group, engine size, engine identification number, fuel system, engine code or calibration number, and test location).

(C) The break-in schedule used on each test engine.

(D) The exhaust emission data for HC, CO, NO_x and PM for each test engine.

The data reported shall be rounded to one significant figure beyond the number of significant figures in the applicable standard as follows for all engines:

| | | | |
|-----|-----|-----------------|------|
| HC | CO | NO _x | PM |
| .XX | .XX | .XX | .XXX |

(E) The retest emissions data, as described in paragraph (b)(6)(C) above for any engine failing the initial test, and description of the corrective measures taken, including specific components replaced or adjusted.

(F) A statistical analysis of the quality-audit test results stating:

1. Number of engines tested.
2. Average emissions and standard deviations of the sample for HC, CO, NO_x, and PM.

(G) All aborted test data and reasons for any aborted tests.

(10) When assembly-line engines exceed an emission standard, as set forth herein, or when data submitted by the manufacturer indicates that assembly-line quality-audit testing is being improperly performed, the manufacturer may be subject to being enjoined from any further sales of such products in the State of California pursuant to Section 43017 of the Health and Safety Code. Prior to seeking to enjoin a manufacturer, the Executive Officer shall consider any information provided by the manufacturer, including any corrective action to the noncomplying engine family group. Enforcement penalties shall be imposed only for egregious violations (e.g., those

situations where emissions from a few engines significantly exceed emission standards, or where the number of engines exceeding the emission standards are significant).

(c) *Selective Enforcement Audit.*

(1)(A) The 2000 and later model year Tier 1, Tier 2, and Tier 3 off-road compression-ignition engines certified for sale in California shall be subject to the Selective Enforcement Audit requirements specified in Subpart F of the 2000 Plus Limited Test Procedures.

(B) The 2008 and later model year Tier 4 off-road compression-ignition engines certified for sale in California shall be subject to the Selective Enforcement Audit requirements specified in Subpart E of Part 1068 of the 2008-[2010 Test Procedures or Part I-E of the 2011](#) and Later Test Procedures [as applicable](#).

(2) These procedures specify the Selective Enforcement Audit test procedures in conjunction with the 2000 Plus Limited Test Procedures and the 2000 and Later Test Procedures. An engine is in compliance with these Selective Enforcement Audit standards and test procedures only when all portions of these Selective Enforcement Audit test procedures are fulfilled.

(3) Air Resources Board (ARB) personnel and mobile laboratories shall have access to engine or equipment assembly plants, distribution facilities, and test facilities for the purpose of engine selection, testing, and observation. Scheduling of access shall be arranged with the designated manufacturer's representative and shall not unreasonably disturb normal operations.

(d) Any manufacturer obtaining certification under this part shall supply to the Executive Officer, upon request, a reasonable number of production engines selected by the Executive Officer which are representative of the engines, emission control systems, fuel systems, and transmissions offered and typical of production models available for sale under the certificate. These engines shall be supplied for testing at such time and place and for such reasonable periods as the Executive Officer may require. Heavy-duty engines supplied under this paragraph may be required to be mounted in chassis and appropriately equipped for operation on a chassis dynamometer.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102, 43104 and 43105, Health and Safety Code. Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104 and 43210-43212, Health and Safety Code.