

➡§ 2430. Applicability.

(a)(1) This article applies to large off-road spark-ignition engines 25 horsepower and greater produced on or after January 1, 2001 and all equipment and vehicles produced on or after January 1, 2001 that use such engines. Beginning January 1, 2007, this article applies to large off-road spark-ignition engines above 19 kilowatt (kW) and all equipment and vehicles that use such engines.

(2) Every new off-road large spark-ignition (LSI) engine that is manufactured for sale, sold, or offered for sale in California, or that is introduced, delivered or imported into California for introduction into commerce and that is subject to any of the standards prescribed in this article and documents incorporated by reference therein, must be certified for use and sale by the manufacturer through the Air Resources Board and covered by an Executive Order, issued pursuant to Chapter 9, Article 4.5, Section 2433.

(3) This article does not apply to engines in vehicles that are subject to requirements of Title 13, California Code of Regulations, Chapter 9, Article 3, Off-Highway Recreational Vehicles and Engines, including any related provisions and guidelines that are applicable to Off-Highway Recreational Vehicles and Engines.

(b) Each part of this article is severable, and in the event that any part of this chapter or article is held to be invalid, the remainder of the article remains in full force and effect.

(c) This article and documents incorporated by reference herein include provisions for emissions certification, labeling requirements, warranty, in-use compliance testing, and production line testing.

➡§ 2431. Definitions.

## DEFINITIONS

(a) The definitions in Section 1900(b), Chapter 1, Title 13 of the California Code of Regulations apply to this Article with the following additions:

(1) "Alternate Fuel" means any fuel that will reduce non-methane hydrocarbons (on a reactivity-adjusted basis), NO<sub>x</sub>, 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.

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

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

(4) "Basic Engine" means an engine manufacturer's description of their unique combination of engine displacement, number of cylinders, fuel system, emission control system, and other engine and emission control system characteristics as determined or specified by the Executive Officer.

(5) "Calendar Year" is the twelve month period commencing on January 1 through December 31.

(6) "Certification Value" means the product of the measured emissions of the prototype engine at zero hours and the (calculated or assigned) deterioration factor.

(7) "Complete Engine Assembly" or "Engine Configuration" means an assembly of a basic engine and all of the specific applicable components (e.g., air intake, fuel and exhaust systems, etc.) and calibrations (e.g., carburetor jet size, valve timing, electronic software/firmware, etc.) required for the assembly to be installed in new equipment.

(8) "Confirmatory testing" means ARB directed emissions tests and inspections of the test engines and/or test equipment used by the manufacturer to obtain test data for submittal with the certification application. The emissions tests may be conducted at ARB, contracted out facilities or at the manufacturer's facility. The testing will be done at the expense of the manufacturer.

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

(10) "Deterioration Factor" means the calculated or assigned number that represents the certification engine's emissions change over the durability period. It is multiplied by zero hour (new) engine test results to determine the engine family compliance level. The deterioration factor is determined as per the Test Procedures. See "Emission Durability Period" below.

(11) "Emission Control System" includes any component, group of components, or engine modification that controls or causes the reduction of substances emitted from an engine.

(12) "Emissions Durability Period" is the period over which, for purposes of certification, a manufacturer must demonstrate compliance with the standards set forth in Section 2433(b). The durability periods are also noted in the table in Section 2433(b). The emissions durability period is used to determine an engine family's deterioration factors.

(13) "Emissions Durability Values" means emissions from an engine that has accumulated service equivalent to the engine's emission durability period, or the result of the product of the zero hour (new) engine test results and the appropriate deterioration factor (e.g., the certification values). The Executive Officer must approve the methods of service accumulation before the manufacturer begins service accumulation.

(14) "End of Assembly-Line" is defined as that place where the final inspection test or production line test is performed.

(15) "Engine Family" is a subclass of a basic engine based on similar emission characteristics. The engine family is the grouping of engines that is used for the purposes of certification.

(16) "Engine Manufacturer" means the manufacturer granted certification.

(17) "Equipment Manufacturer" means the manufacturer using the engine provided by the engine manufacturer to power equipment or vehicle.

(18) "Exhaust Emissions" means substances emitted into the atmosphere from any opening downstream from the exhaust port of an engine.

(19) "Family Emission Level or FEL" means an emission level that is declared by the manufacturer to serve for the averaging, banking, and trading program and in lieu of an emission standard for certification. The FEL serves as the engine family's emission standard for emissions compliance efforts. If the manufacturer does not declare an FEL for an engine family, the applicable emissions standard must be treated as that engine family's FEL for the purposes of any provision of this Article. The FEL must be expressed to the same number of decimal places as the applicable emission standard.

(20) "Final Calendar Quarter Production" is defined as the calendar quarter in which the production of an engine family ends.

(21) "First Calendar Quarter Production" is defined as the calendar quarter in which the production of an engine family begins.

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

(23) "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 applies only for determination of control limits.

(24) "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.

(25) "New Engine" is defined as an engine's ownership has not been transferred to the ultimate consumer.

(26) "New Engine Compliance testing" means ARB directed emissions tests and inspections of a reasonable number of production engines and/or equipment that are offered for sale, or manufactured for sale, in California in order to verify compliance with the applicable emission standards. The emissions tests must be conducted at a qualified testing facility. The testing facility is chosen by the manufacturer and approved by the Executive Officer. This may include ARB facilities, contracted out facilities, or the manufacturer's facility. The testing will be done at the expense of the manufacturer.

(27) "New Equipment" means an equipment's ownership has not been transferred to the ultimate consumer.

(28) "Off-Road Large Spark-ignition Engines" or "LSI Engines" means any engine that produces a gross horsepower 25 and greater horsepower or is designed (e.g., through fueling, engine calibrations, valve timing, engine speed modifications, etc.) to produce 25 and greater horsepower (greater than 19 kilowatts on or after January 1, 2007). If an engine family has models at or above 25 horsepower and models below 25 horsepower, only the models at or above 25 horsepower (greater than 19 kilowatts on or after January 1, 2007) would be considered LSI engines. The engine's operating characteristics are significantly similar to the theoretical Otto combustion cycle with the engine's primary means of controlling power output being to limit the amount of air that is throttled into the combustion chamber of the engine. LSI engines or alternate fuel powered LSI internal combustion engines are designed for powering, but not limited to powering, forklift trucks, sweepers, generators, and industrial equipment and other miscellaneous applications. All engines and equipment that fall within the scope of the preemption of Section 209(e)(1)(A) of the Federal Clean Air Act, as amended, and as defined by regulation of the Environmental Protection Agency, are specifically excluded from this category.

Specifically excluded from this category are: 1) engines operated on or in any device used exclusively upon stationary rails or tracks; 2) engines used to propel marine vessels; 3) internal combustion engines attached to a foundation at a location for at least 12 months; 4) off-road recreational vehicles and snowmobiles; and 5) stationary or transportable gas turbines for power generation.

(29) "Off-Road Vehicle" or "Off-Road Equipment" means any non-stationary device, powered by an internal combustion engine or motor, used primarily off the highways to propel, move, or draw persons or property including any device propelled, moved, or drawn exclusively by human power, and used in, but not limited to, any of the following applications: Marine Vessels, Construction/Farm Equipment, Locomotives, Small Off-Road Engines, Off-Road Motorcycles, and Off-Highway Recreational Vehicles.

(30) "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 which can enter the combustion chambers of the engine. As an example, gasoline-fueled engines are Otto cycle engines.

(31) "Production Line Test" is defined as the emissions test performed on a sample of production engines produced for sale in California and conducted according to the Test Procedures.

(32) "Representative Engine Sample" means that the sample is typical of the engine family or engine family group as a whole (as defined in the Test Procedures). Except as provided in Section 2437, a representative sample would not include a low volume subgroup of the engine family or engine family group.

(33) "Scheduled Maintenance" means any adjustment, repair, removal, disassembly, cleaning, or replacement of equipment or engine 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 equipment or engine malfunction or failure for which periodic maintenance is not appropriate.

(34) "Small Volume Manufacturer" means an engine manufacturer that produces a total of less than 2000 large spark-ignition engines annually for sale in the United States.

(35) "Test Procedures" means the procedures specified in both Part I and Part II of the "California Exhaust Emission Standards and Test Procedures for New 2001 and Later Off-Road Large Spark-ignition Engines", and as specified in Section 2433(c).

(36) "Test Sample" means the collection of engines selected from the population of an engine family for emission testing.

(37) "Ultimate Purchaser" means the first person who in good faith purchases a new LSI engine or equipment using such engine for purposes other than resale.

(38) "Unscheduled Maintenance" means any inspection, adjustment, repair, removal, disassembly, cleaning, or replacement of engine, equipment or vehicle components or systems that is performed to correct or diagnose a part failure or equipment or vehicle (if the engine were installed in a vehicle) malfunction that was not anticipated.

(39) "Useful life" means a period of 7 years or 5000 hours of operation, whichever first occurs for engines having engine displacement greater than 1.0-liter, and 2 years or 1,000 hours of operations, whichever occurs first, for engines having engine displacement equal to or less than 1.0-liter. However, in no case may this period be less than the manufacturer's basic mechanical warranty period for the engine family.

(40) "Warrantable Condition" means any condition of an engine that requires the manufacturer to take corrective action pursuant to Section 2435.

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

(42) "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.

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

➡§ 2432. Test Procedures.

Test procedures referred to in this chapter may be obtained from the State Air Resources Board at 9528 Telstar Avenue, El Monte, California 91731.

➡§ 2433. Emission Standards and Test Procedures - Off-Road Large Spark-Ignition Engines.

(a) This section applies to new off-road large spark-ignition engines produced on or after January 1, 2001. For the purpose of this section, these engines are also referred to as "new off-road LSI engines."

(b) Standards.

(1)(A) Exhaust Emission Standards. Exhaust emissions from off-road large spark-ignition engines manufactured for sale, sold, or offered for sale in California, or that are introduced, delivered or imported into California for introduction into commerce, must not exceed:

Exhaust Emission Standards

grams per brake horsepower-hour)

[grams per kilowatt-hour]<sup>(1)</sup>

<i>Model Year</i>	<i>Engine Displacement</i>	<i>Durability Period</i>	<i>HC + NO<sub>x</sub></i>	<i>Carbon Monoxide</i>
2002–2010	≤ 1.0 liter	1,000 hours or 2 years	9.0 [12.0]	410 [549]
2011 and subsequent	≤ 825 cc	1,000 hours or 2 years	6.0 [8.0]	410 [549]
2011–2014	> 825 cc – ≤ 1.0 liter	1,000 hours or 2 years	4.8 [6.5]	280 [375]
2015 and subsequent	> 825 cc – ≤ 1.0 liter	1,000 hours or 2 years	0.6 [0.8]	15.4 [20.6]
2001– 2003 <sup>(2),(3)</sup>	> 1.0 liter	N/A	3.0 [4.0]	37.0 [49.6]
2004–2006 <sup>(4)</sup>	> 1.0 liter	3500 hours or 5 years	3.0 [4.0]	37.0 [49.6]
2007–2009	> 1.0 liter	5000 hours or 7 years	2.0 [2.7]	3.3 [4.4]
2010 and subsequent <sup>(5),(6)</sup>	> 1.0 liter	5000 hours or 7 years	0.6 [0.8]	15.4 [20.6]

Note:<sup>(1)</sup> For 2006 and previous model years, standards in grams per kilowatt-hour are given only as a reference. For 2007 and subsequent model years, pollutant emissions reported to ARB by manufacturers must be in grams per kilowatt-hour.

<sup>(2)</sup> Small volume manufacturers are not required to comply with these emission standards.

<sup>(3)</sup> Manufacturers must show that at least 25 percent of its California engine sales comply with the standards in 2001, 50 percent in 2002, and 75 percent in 2003.

<sup>(4)</sup> The standards for in-use compliance for engine families certified to the standards in the row noted are 4.0 g/bhp-hr (5.4 g/kW-hr) hydrocarbon plus oxides of nitrogen and 50.0 g/bhp-hr (67.0 g/kW-hr) carbon monoxide, with a useful life of 5000 hours or 7 years. In-use averaging, banking, and trading credits may be generated for engines tested in compliance with these in-use compliance standards. If the in-use compliance level is above 3.0 but does not exceed 4.0 g/bhp-hr hydrocarbon plus oxides of nitrogen or is above 37.0 but does not exceed 50.0 g/bhp-hr carbon monoxide, and based on a review of information derived from a statistically valid and representative sample of engines, the Executive Officer determines that a substantial percentage of any class or category of such engines exhibits within the warranty periods noted in Section 2435, an identifiable, systematic defect in a component listed in that section, which causes a significant increase in emissions above those exhibited by engines free of such defects and of the same class or category and having the same period of use and hours, then the Executive Officer may invoke the enforcement authority under Section 2439, Title 13, California Code of regulations to require remedial action by the engine manufacturer. Such remedial action is limited to owner notification and repair or replacement of defective components, without regard to the requirements set forth in Section 2439(b)(5) or Section 2439(c)(5)(B)(vi). As used in the section, the term "defect" does not include failures that are the result of abuse, neglect, or improper maintenance.

<sup>(5)</sup> For severe-duty engines, the HC+NO<sub>x</sub> standard is 2.7 g/kW-hr and the CO standard is 130.0 g/kW-hr.

<sup>(6)</sup> Small volume manufacturers are required to comply with these emission standards in 2013.

(B) For the 2007 through 2009 model years, you may alternatively certify your engines according to the following formula instead of the standards in paragraph (b)(1)(A) of this section:

$$(\text{HC}+\text{NO}_x) \times \text{CO}^{0.784} \leq 8.57.$$

Where: HC + NO<sub>x</sub> = hydrocarbon plus oxides of nitrogen family

emissions level (FEL) in g/kW-hr

CO = carbon monoxide FEL in g/kW-hr

The HC+NO<sub>x</sub> and CO emission levels selected to satisfy this formula, rounded to the nearest 0.1 g/kW-hr, become the emission standards that apply for those engines. You may not select an HC+NO<sub>x</sub> FEL higher than 2.7 g/kW-hr or a CO FEL higher than 20.6 g/kW-hr.

(C) Field Testing Standards. The field testing standards for model year 2007 and subsequent off-road large spark-ignition engines are described in subpart F, Title 40 CFR Sections 1048.101(c), as adopted July 13, 2005.

(2)(A) Optional Exhaust Emission Standards. Manufacturers may certify LSI engines manufactured for sale, sold, or offered for sale in California, or that are introduced, delivered or imported into California for introduction into commerce to the following optional low emission standards.

Optional Exhaust Emission Standards

(grams per brake horsepower-hour)

[grams per kilowatt-hour]<sup>(1)</sup>

<i>Model Year</i>	<i>Engine Displacement</i>	<i>Durability Period</i>	<i>HC+NOx</i>	<i>Carbon Monoxide</i>
2007–2009	> 1.0 liter	5000 hours or 7 years	1.5 [2.0]	4.8 [6.4]
2007–2009	> 1.0 liter	5000 hours or 7 years	1.0 [1.3]	8.3 [11.1]
2007–2009	> 1.0 liter	5000 hours or 7 years	0.6 [0.8]	15.4 [20.6]
2007–2009	> 1.0 liter	5000 hours or 7 years	0.4 [0.5]	15.4 [20.6]
2007–2009	> 1.0 liter	5000 hours or 7 years	0.2 [0.3]	15.4 [20.6]
2007–2009	> 1.0 liter	5000 hours or 7 years	0.1 [0.1]	15.4 [20.6]
2010 and subsequent	> 1.0 liter	5000 hours or 7 years	0.4 [0.5]	15.4 [20.6]
2010 and subsequent	> 1.0 liter	5000 hours or 7 years	0.2 [0.3]	15.4 [20.6]
2010 and subsequent	> 1.0 liter	5000 hours or 7 years	0.1 [0.1]	15.4 [20.6]

Note:<sup>(1)</sup> Pollutant emissions reported to ARB by manufacturers must be in grams per kilowatt-hour.

(B) Field Testing Standards. The field testing standards for optional emission standard LSI engines shall be 140 percent of the corresponding optional HC+NOx standard and 150 percent of the corresponding optional CO standard, rounded to the nearest tenth of one gram, using the field testing procedures described in subpart F, Title 40 CFR Section 1048.101(c), as adopted July 13, 2005.

(3) Crankcase Emissions. No crankcase emissions shall be discharged into the ambient atmosphere from any new 2001 or later model year off-road LSI engines.

(4) Evaporative Emission Standards.

(A) Starting in the 2007 model year, LSI engines over one liter that run on a volatile liquid fuel (such as gasoline), must meet the following evaporative emissions standards and requirements:

1. Evaporative hydrocarbon emissions may not exceed 0.2 grams per gallon of fuel tank capacity when measured with the test procedures for evaporative emissions as described in subpart F, Title 40 Code of Federal Regulations (CFR) Sec.1048, as adopted July 13, 2005.

2. For nonmetallic fuel lines, you must specify and use products that meet the Category 1 specifications in SAE J2260 (issued November 1996).

3. Liquid fuel in the fuel tank may not reach boiling during continuous engine operation in the final installation at an ambient temperature of 30°C. Note that gasoline with a Reid vapor pressure of 62 kPa (9 psi) begins to boil at about 53°C.

4. Design-based certification as described in subpart F, Title 40 CFR Sections 1048.105 and 1048.245, as adopted July 13, 2005, may be used instead of generating new emission data.

(B) Starting with the 2011 model year, LSI engines with an engine displacement less than or equal to 1.0 liter that run on a volatile liquid fuel (such as gasoline), must meet the evaporative emission requirements for small off-road engines, which are specified in Title 13, Chapter 15, Article 1, except that the small volume tank exemption set out in Title 13 section 2766 is not available for such LSI engines and/or equipment manufacturers that use such LSI engines.

(5) Recreational Vehicle Engines. Except as noted below, starting with the 2011 MY, LSI engines with an engine displacement less than or equal to 1.0 liter used in off-highway motor vehicles that, with the exception of payload capacity, meet the "Off-Road Sport Vehicle" or "Off-Road Utility Vehicle" definition in Title 13, Section 2411, must meet the exhaust emission standards in Section 2433(b)(1)(A). LSI engines with an engine displacement greater than 825 cc but less than or equal to 1.0 liter need not meet the 2015 and subsequent exhaust emission standards in Section 2433(b)(1)(A). These engines are subject to the test procedures and certification procedures for off-highway recreational vehicles and engines which are specified in Title 13, Chapter 9, Article 3.

(c) Test Procedures. The test procedures for determining certification and compliance with the standards for exhaust emissions from new model year 2001 through 2006 off-road LSI engines with engine displacement greater than 1.0 liter sold in the state are set forth in "California Exhaust Emission Standards and Test Procedures for New 2001 through 2006 Off-Road Large Spark-ignition Engines, Parts I and II," adopted September 1, 1999, and as last amended March 2, 2007. The test procedures for determining certification and compliance with the standards for exhaust and evaporative emissions from new model year 2007 through 2009 off-road LSI engines with engine displacement greater than 1.0 liter sold in the state are set forth in "California Exhaust and Evaporative Emission Standards and Test Procedures for New 2007 through 2009 Off-Road Large Spark-ignition Engines (2007-2009 Test Procedure 1048)," adopted March 2, 2007. The test procedures for determining certification and compliance with the standards for exhaust and evaporative emissions from new model year 2010 and subsequent off-road LSI engines with engine displacement greater than 1.0 liter sold in the state are set forth in "California Exhaust and Evaporative Emission Standards and Test Procedures for New 2010 and Later Off-Road Large Spark-ignition Engines (2010 and Later Test Procedure 1048)," adopted March 2, 2007, as last amended November 21, 2008. The test procedures for determining compliance with the standards for exhaust and evaporative emissions for new model year 2007 and subsequent off-road LSI engines with engine displacement greater than 1.0 liter sold in the state are set forth in the "California Exhaust and Evaporative Emission Standards and Test Procedures for New 2007 and Later Off-Road

Large Spark-Ignition Engines (Test Procedures 1065 and 1068)", adopted March 2, 2007.

(d)(1) The test procedures for determining certification and compliance with the standards for exhaust emissions from new LSI engines with an engine displacement less than or equal to 1.0 liter sold in the state are set forth in "California Exhaust Emission Standards and Test Procedures for 1995-2004 Small Off-Road Engines," as last amended July 26, 2004 or "California Exhaust Emission Standards and Test Procedures for 2005 and Later Small Off-Road Engines," adopted July 26, 2004.

(2) The test procedures for determining certification and compliance with the standards for evaporative emissions from new model year 2011 and subsequent LSI engines with an engine displacement less than or equal to 1.0 liter are set forth in "Test Procedure for Determining Permeation Emissions from Small Off-Road Engines and Equipment Fuel Tanks (TP-901)," adopted July 26, 2004, "Test Procedure for Determining Diurnal Evaporative Emissions from Small Off-Road Engines and Equipment (TP-902)," adopted July 26, 2004, "Certification and Approval Procedure for Small Off-Road Engine Fuel Tanks (CP-901)", adopted July 26, 2004, and "Certification and Approval Procedures for Evaporative Emission Control Systems (CP-902)", adopted July 26, 2004.

(e) Replacement Engines.

(1) [Reserved]

(2)(A) Beginning in 2004, a new off-road large spark-ignition 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 described in paragraph (b), shall not be subject to the emissions requirements of paragraph (b) provided that:

(i) 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

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

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

**THIS ENGINE DOES NOT COMPLY WITH CALIFORNIA OFF-ROAD OR ON-HIGHWAY EMISSION REQUIREMENTS. SALE OR INSTALLATION OF THIS ENGINE FOR ANY PURPOSE OTHER THAN AS A REPLACEMENT ENGINE IN AN OFF-ROAD VEHICLE OR PIECE OF OFF-ROAD EQUIPMENT WHOSE ORIGINAL ENGINE WAS NOT CERTIFIED IS A VIOLATION OF CALIFORNIA LAW SUBJECT TO CIVIL PENALTY.**

(B) At the beginning of each model year, the manufacturer of replacement engines must provide, by engine model, an estimate of the number of replacement engines it expects to produce for California for that model year.

(C) At the conclusion of the model year, 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 that certified replacement engine(s) were not available as per paragraph (A).

➡§ 2434. Emission Control Labels - 2001 and Later Off-Road Large Spark-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. This section applies to:

(1) 2001 and later model year off-road LSI engines with engine displacement greater than 1.0 liter, that have been certified to the applicable emission standards pursuant to Section 2433(b).

(2) Engine manufacturers and original equipment manufacturers, as applicable, that have certified such engines.

(3) Original equipment manufacturers, regardless of whether they have certified the engine, if their equipment obscures the emission control labels of such certified engines.

(4) 2002 and later model year off-road LSI engines with engine displacement less than or equal to 1.0 liter must comply with the applicable labeling specifications set forth in the California Code of Regulations, Title 13, Section 2404.

(c) Label Content and Location.

(1) A tune-up label made of a permanent material must be welded, riveted or otherwise 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 must attach a supplemental label such that it is readily visible.

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

(3) In addition, an engine serial number and date of engine manufacture (month and year) must be stamped on the engine block or stamped on a metal label riveted or permanently attached to the engine block. Engine manufacturers must keep records such that the engine serial number can easily be used to determine if an engine was certified for the applicable model year. Alternative engine serial number identification methods or tracking number may be allowed with prior approval from the Executive Officer.

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

(5) The label must contain the following information:

(A) The label heading must read:

"Important Engine Information."

(B) Full corporate name and trademark of the manufacturer.

(C) "THIS ENGINE IS CERTIFIED TO OPERATE ON (specify operating fuel(s))."

(D) Identification of the Exhaust Emission Control System. Abbreviations may be used and must conform to the nomenclature and abbreviations found in the Society of Automotive Engineers document J1930 which is incorporated by reference in Section 1977, Title 13, CCR, entitled "Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms".

(E) The maintenance specifications and adjustments recommended by the engine manufacturer, including, as applicable: spark plug gap width, valve lash, ignition timing, idle air/fuel mixture setting procedure and value (e.g., idle CO, idle speed drop), and high idle speed. These specifications must 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 must include in lieu of the "specifications" the single statement "No other adjustments needed." For all engines, the instructions for tune-up adjustments must 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.

(F) Any specific fuel or engine lubricant requirement (e.g., research octane number, engine lubricant type).

(G) An unconditional statement of compliance with the appropriate model year (for 2001-2003) or (2004 and subsequent) California regulations; for example, "This engine conforms to 2002 California regulations for off-road large spark-ignition engines and is certified to 3.0 g/bhp-hr HC+NO<sub>x</sub> and 37 g/bhp-hr CO." or "This engine conforms to 2007 California regulations for off-road large spark-ignition engines and is certified to 0.8 g/kW-hr [0.6 g/bhp-hr] HC+NO<sub>x</sub> and 20.6 g/kW-hr [15.4 g/bhp-hr] CO."

(H) Total engine displacement (in cubic inches and/or liters) of the engine upon which the engine label is attached.

(I) The engine family identification (i.e., engine family name and manufacturer's own engine group/code).

(6)(A) The manufacturer of any engine certified with a clean fuel (i.e. natural gas ) must at the time of engine manufacture, affix a permanent legible label specifying the appropriate operating fuel(s).

(B) The label must be located immediately adjacent to each fuel tank filler inlet and outside of any filler inlet compartment. It must be located so that it is readily visible to any person introducing fuel to such filler inlet; provided, however, that the Executive Officer must 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 must be affixed to the engine and located so that it is readily visible. Such labels must be in English and in block letters which must be of a color that contrasts with their background.

(d) An engine label may state that the 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) Supplemental Engine Label Content and Location.

(1) When a final equipment assembly that is marketed to any ultimate purchaser is manufactured and the engine label attached by the engine manufacturer is obscured (i.e., not readily visible), the manufacturer of the final equipment assembly (i.e., original equipment manufacturer) must attach a supplemental engine label upon the engine or equipment. The supplemental engine label must be plastic or metal, and must be welded, riveted or otherwise attached permanently to an area of the engine or equipment assembly so as to be readily visible to the average person.

(2) The manufacturer required to attach a supplemental engine label must consider the possibility of accidental damage to the supplemental engine label in the determination of the label location. Such a label must not be attached to any engine or equipment

component that is likely to be replaced during the useful life of the engine or equipment (as applicable). Such a label must not be attached to any engine or equipment component that is detached easily from the engine or equipment (as applicable).

(3) The supplemental engine label information must be written in the English language and use block letters and numerals (i.e., sans serif, upper-case characters) that must be of a color that contrasts with the background of the label.

(4) A supplemental engine label must contain the information as specified in Subsection (c)(4), except that the date of engine manufacture specified in (c)(3) may be deleted from the supplemental engine label. When the date of engine manufacture does not appear on the supplemental engine label, the responsible original equipment manufacturer must display (e.g., label, stamp, etc.) the date elsewhere on the engine or equipment so as to be readily visible.

(f) As used in these specifications, readily visible to the average person means that the label must 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 must be no smaller than 8 point type size (2 millimeter in height) provided that no equipment or engine parts (including all manufacturer available optional equipment), except for flexible parts, obstruct the label.

(g) The labels and any adhesives used must 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 must include, but are not limited to, exposure to engine fuels, lubricants and coolants (e.g., gasoline, motor oil, water, ethylene glycol). The manufacturer must submit, with its certification application, a statement attesting that its labels comply with these requirements.

(h) The manufacturer must obtain approval from the Executive6B 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.

(i) Samples of all actual production labels used within an engine family must be submitted to the Executive Officer within thirty days after the start of production. Engine manufacturers must provide samples of their own applicable production labels, and samples of applicable production original equipment manufacturer labels that are accessible to the engine manufacturer due to the direct market arrangement between such manufacturers.

(j) 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.

(k) The manufacturer of any engine must 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.

(1)(1) If the Executive Officer finds any engine manufacturer using labels that are different from those approved or that do not substantially comply with the readability or durability requirements set forth in these specifications, the engine manufacturer will be subject to revocation or suspension of Executive Orders for the applicable engine families, or enjoined from any further sales, or distribution, of such noncompliant engine families, or subgroups within the engine families, in the State of California pursuant to Section 43017 of the Health and Safety Code. Before seeking to enjoin an engine manufacturer, the Executive Officer will consider any information provided by the engine manufacturer. In addition, the engine manufacturer may be subject to, on a per engine basis, any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

(2) If the Executive Officer finds any original equipment manufacturer using labels for which it has responsibility for attaching that are different from those approved or that do not substantially comply with the readability or durability requirements set forth in these specifications, the equipment manufacturer will be subject to being enjoined from any further sales, or distribution, of the applicable equipment product line that uses such noncompliant labels in the State of California pursuant to Section 43017 of the Health and Safety Code. Before seeking to enjoin an equipment manufacturer, the Executive Officer will consider any information provided by the equipment manufacturer. In addition, the equipment manufacturer may be subject to, on a per engine basis, any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

➡§ 2435. Defects Warranty Requirements for 2001 and Later Off-Road Large Spark-Ignition Engines.

(a) Applicability. This section applies to new 2001 and later model year off-road large spark-ignition engines with engine displacement greater than 1.0 liter that are certified to the applicable emission standards pursuant to Section 2433(b). The warranty period begins on the date the engine or equipment is delivered to an ultimate purchaser. The use of alternative fuels must not void the warranties on any engine certified to use such fuel. 2002 and later model year off-road LSI engines with engine displacement less than or equal to 1.0 liter must comply with the applicable warranty requirements set forth in the California Code of Regulations, Title 13, Section 2405.

(b) General Emissions Warranty Coverage. The manufacturer of each off-road large spark-ignition engine must 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:

(A) 2 years or 1,500 hours, whichever occurs first, for 2001-2003 model year certified engines having engine displacement greater than 1.0 liter.

(B) 3 years or 2,500 hours, whichever occurs first, for 2004 and later model year engines having engine displacement greater than 1.0 liter.

(3) Free from defects in materials and workmanship which cause the failure of a high-cost warranted part to be identical in all material respects to the part as described in the engine manufacturer's application for certification for 2004 and later model year engines having engine displacements greater than 1.0 liter, for a period of five years or 3,500 hours of operation, whichever occurs first.

(A) Each manufacturer shall identify in its application for certification the "high-priced" warranted parts which (i) are included on the Board's "Emission Warranty Parts List" as last amended February 22, 1985, incorporated herein by reference, and (ii) have an individual replacement cost, at the time of certification, exceeding the cost limit defined in subsection (B). The replacement cost shall include the cost of the part, labor and standard diagnosis. The costs shall be those of the highest-cost metropolitan area of California.

(B) The dollar value of a high cost part shall be based on the following formula:

$$\text{Cost Limitn} = \$300 * (\text{CPI } n-2 / 118.3)$$

where,

Cost Limitn is the cost limit for the applicable model year of the engine rounded to the nearest ten dollars.

n is the model year of the new engines.

n-2 is the calendar year two years prior to the model year of the new engines.

CPI= is the annual average nationwide urban consumer price index published by the United States Bureau of Labor Statistics.

(C) The cost limit shall be reviewed annually by the Executive Officer. The highest-cost metropolitan area in California shall be identified by the Executive Officer for use in this

subsection. If a manufacturer seeks certification of an engine before the applicable annual average CPI is available, the cost limit shall be calculated using the average of the monthly nationwide urban CPI figures for the most recent twelve month period for which figures have been published by the United States Bureau of Labor Statistics.

(D) Each manufacturer shall submit to the Executive Officer the documentation used to identify the "high-priced" warranted parts required in this subsection. The documentation shall include the estimated retail parts costs, labor rates in dollars per hour, and the labor hours necessary to diagnosis and replace the parts.

(4) In the absence of a device to measure hours of use, the engine must be warranted for a period of the years noted above in subsections (2) and (3). If a device to measure hours is used, the engine must be warranted for the number of hours or the number of years noted above in subsections (2) and (3), whichever occurs first.

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

(1) Any warranted part that is not scheduled for replacement as required maintenance in the written instructions required by Subsection (e) must be warranted for the warranty period defined in Subsection (b)(2) and (b)(3). If any such part fails during the period of warranty coverage, it must be repaired or replaced by the engine manufacturer according to Subsection (4) below. Any such part repaired or replaced under the warranty must be warranted for the remaining warranty period.

(2) Any warranted part that is scheduled only for regular inspection in the written instructions required by Subsection (e) must be warranted for the warranty period defined in Subsection (b)(2) and (b)(3). A statement in such written instructions to the effect of "repair or replace as necessary" must not reduce the period of warranty coverage. Any such part repaired or replaced under warranty must be warranted for the remaining warranty period.

(3) Any warranted part that is scheduled for replacement as required maintenance in the written instructions required by Subsection (e) must 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 must be repaired or replaced by the engine manufacturer according to Subsection (4) below. Any such part repaired or replaced under warranty must 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 must be performed at no charge to the owner at a warranty station.

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

(6) The owner must 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 must 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) and (b)(3), the engine manufacturer must 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 must 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 will, at the discretion of the engine manufacturer, be grounds for disallowing a warranty claim made in accordance with this article. The engine manufacturer must 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 must provide, any documents that describe that manufacturer's warranty procedures or policies.

(d) Each manufacturer must 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) Carburetor system (internal parts and/or pressure regulator or fuel mixer or injection system).

(D) Cold start enrichment system.

(2) Air Induction System

(A) Intake manifold or air intake system.

(B) Air mass sensor assembly.

(C) Turbocharger/supercharger 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) Positive Crankcase Ventilation (PCV) System.

(A) PCV Valve.

(B) Oil Filler Cap.

(7) Ignition Control System

(A) Engine Control Module (ECM).

(B) Ignition module(s).

(8) Miscellaneous items Used in Above Systems

(A) Vacuum, temperature, and time sensitive valves and switches.

(B) Sensors used for electronic controls.

(C) Hoses, belts, connectors, assemblies, clamps, fittings, tubing, sealing gaskets or devices, and mounting hardware.

(D) Pulleys, belts and idlers.

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

(f) Each manufacturer must 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) must be a condition of certification. The Executive Officer must approve or disapprove the documents required by Subsections (d) and (e) within 90 days of the date such documents are received from the manufacturer. Any disapproval must be accompanied by a statement of the reasons therefor. In the event of disapproval, the manufacturer may file for an adjudicative hearing under Title 17, California Code of Regulation, Division 3, Chapter 1, Subchapter 1.25 to review the decision of the Executive Officer.

(g) In the application, each manufacturer must include a statement concerning proper maintenance of the engine to maximize emissions performance. The statement must 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.

➡§ 2436. Emission Control System Warranty Statement.

(a) Each manufacturer must furnish a copy of the following statement with each new off-road large spark-ignition engine with engine displacement greater than 1.0 liter, that have been certified to the applicable emission standards pursuant to Section 2433(b), using those portions of the statement applicable to the engine. Each manufacturer must furnish a copy of the warranty statement as set forth in the California Code of Regulations, Title 13, Section 2406(a) with each new off-road large spark-ignition engine with engine displacement less than or equal to 1.0 liter, 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 (model year(s)) (equipment type or off-road large spark-ignition) engine. In California, new off-road large spark-ignition (LSI) 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 carburetor, regulator or fuel-

injection system, ignition system, engine computer unit (ECM), catalytic converter and air induction system. Also included may be sensors, hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, (manufacturer's name) will repair your LSI engine at no cost to you including diagnosis, parts and labor. MANUFACTURER'S WARRANTY COVERAGE: The (model year(s)) off-road large spark-ignition 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 off-road LSI 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 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 off-road large spark-ignition engine owner, you should however be aware that (manufacturer's name) may deny you warranty coverage if your off-road large spark-ignition engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications. - Your engine is designed to operate on (specific fuel(s)). 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 off-road large spark-ignition 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) Warranty statement furnishing requirements.

(1) Commencing with the 2001 model year for large off-road large spark-ignition engines with engine displacement greater than 1.0 liter, each manufacturer must furnish with each new engine a warranty statement that generally describes the obligations and rights of the engine manufacturer and owner under this article. Engine manufacturers must also include in the warranty statement a phone number the customer may use to obtain their nearest franchised service center.

(2) Commencing with the 2002 model year for large off-road large spark-ignition engines with engine displacement less than or equal to 1.0 liter, each manufacturer must furnish with each new engine a warranty statement as set forth in the California Code of Regulations, Title 13, Section 2406(b).

(c) Each manufacturer must 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) must be a condition of certification. The Executive Officer must

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 must be accompanied by a statement of the reasons therefor. In the event of disapproval, the manufacturer may petition the Board to review the decision of the Executive Officer.

➡§ 2437. New Engine Compliance and Production Line Testing - New Off-Road Large Spark-Ignition Engines Selection, Evaluation, and Enforcement Action.

(a) Compliance Test Procedures

(1) These procedures apply, commencing with the 2001 model year, to any large off-road spark-ignition engine family group (as defined in Sections 2 and 11 of the "California Exhaust Emission Standards and Test Procedures for New 2001 and Later Off-Road Large Spark-ignition Engines") or any subgroup within an engine family group selected for compliance testing pursuant to this section, with an engine displacement greater than 1.0 liter, that have been certified to the applicable emission standards pursuant to Section 2433(b). 2002 and later model year large off-road spark-ignition engines with engine displacement less than or equal to 1.0 liter must comply with the new engine compliance test procedures set forth in the California Code of Regulations, Title 13, Section 2407.

(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 must be representatively selected from sources specified by the Executive Officer according to a method approved by him/her, that insofar as practical must exclude engines that would result in an unreasonable disruption of the manufacturer's distribution system. To the extent practical, the Executive Officer must test a representative configuration (as defined in Section 3 of the "California Exhaust Emission Standards and Test Procedures for New 2001 and Later Off-Road Large Spark-ignition Engines") 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 emissions of the engine family group as a whole.

(3) For all 2001 and subsequent model year off-road large spark-ignition engines selected for compliance testing, the selection and testing of engines and the evaluation of data must 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 may 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 2433, at its own expense. In such an instance, the Executive Officer must order testing only in those cases where evidence such as production line test data or in-use test data indicate that engines may not be in compliance.

(5) All testing must 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 production-line 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 must 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 that 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 that would be obvious in customer service and that 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 must be randomly chosen from the selected engine family group or subgroup. Prior to the start of testing, manufacturers must indicate that sampling plan (as described in paragraphs (9) and (10), below) they will use. Once testing has begun, manufacturers may not switch to the other sampling plan; the generated test results will be final. Each chosen engine must be tested according to the "California Exhaust Emission Standards and Test Procedures for New 2001 and Later Off-Road Large Spark-ignition Engines" ("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

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

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

$$U = \frac{\sum_{i=1}^n (x_i - \mu_0)}{(\sum_{i=1}^n (x_i - \mu_0)^2)^{0.5}}$$

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

$\mu_0$  = the applicable calendar year emission standard for that pollutant.

$n$  = the number of engines tested.

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

(11) If no decision for a pollutant or pollutants can be reached after 20 engines have been tested, the Executive Officer will not make a "Fail" decision for the selected engine family or subgroup on the basis of these 20 tests alone. Under these circumstances the Executive Officer will 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 will render a "Fail" decision.

(12) If the Executive Officer determines, in accordance with the procedures set forth in Subsection (a) that an engine family, or any subgroup within an engine family, exceeds the emission standards for one or more pollutants, the Executive Officer will:

(A) Notify the engine manufacturer that the engine manufacturer may be subject to revocation or suspension of the Executive Order authorizing sales and distribution of the noncompliant engines in the State of California, or enjoined from any further sales or distribution, of the noncompliant engines in the State of California pursuant to Section 43017 of the Health and Safety Code. Prior to revoking or suspending the Executive Order, or seeking to enjoin an engine manufacturer, the Executive Officer will consider production line test results, if any, and any additional test data or other information provided by the engine manufacturer and other interested parties. In addition, the engine manufacturer may be subject to, on a per engine basis, any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

(B) Notify the equipment manufacturer that the equipment manufacturer may be subject to revocation or suspension of the Executive Order authorizing sales and distribution of the noncompliant engines in the State of California, or being enjoined from any further sales, or distribution, of the equipment manufacturer's equipment product line(s) that are, or utilize engines that are, noncompliant with the applicable emission regulations pursuant to Section 43017 of the Health and Safety Code. Prior to revoking or suspending the Executive Order, or seeking to enjoin an equipment manufacturer, the Executive Officer will consider production line test results, if any, and any additional test data or other information provided by the equipment manufacturer and other interested parties. In addition, the equipment manufacturer may be subject to, on a per engine basis, any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

(13) Engines selected for inspection must be checked to verify the presence of those emissions-related components specified in the engine 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 will:

(A) Notify the engine manufacturer and may seek to revoke or suspend the Executive Order authorizing sales and distribution or enjoin the engine manufacturer from any further sales, or distribution, of the applicable noncompliant engine families or subgroups within the engine families in the State of California pursuant to Section 43017 of the Health and Safety Code. Before revoking or suspending the Executive Order authorizing sales and distribution of the applicable noncompliant engine families or subgroups within the State of California, or seeking to enjoin an engine manufacturer, the Executive Officer will consider any information provided by the engine manufacturer and other interested parties. In addition, the engine manufacturer may be subject to, on a per engine basis, any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

(B) Notify the equipment manufacturer and may seek to revoke or suspend the Executive Order authorizing sales and distribution or enjoin the equipment manufacturer from any further sales, or distribution, in the State of California of the equipment manufacturer's equipment product line(s) that are, or utilize engines that are, noncompliant with the applicable emission regulations pursuant to Section 43017 of the Health and Safety Code. Prior to revoking or suspending the Executive Order authorizing sales and distribution of the applicable noncompliant equipment, or seeking to enjoin an equipment manufacturer, the Executive Officer will consider any information provided by the equipment manufacturer and other interested parties. In addition, the equipment manufacturer may be subject to, on a per engine basis, any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

(b) 2001 and Subsequent Model Cumulative Sum Production Line Test Procedures

(1) The 2001 and subsequent model year off-road large spark-ignition engines with an engine displacement of greater than 1.0 liter, that have been certified to the applicable emission standards pursuant to Section 2433(b), are subject to production line testing performed according to the requirements specified in this section. The 2002 and subsequent model year off-road large spark-ignition engines with an engine displacement of less than or equal to 1.0 liter, that have been certified for sale in California, must comply with production line testing performed according to the requirements set forth in the California Code of Regulations, Title 13, Section 2407.

(A) Standards and Test Procedures. The emission standards, exhaust sampling and analytical procedures are those described in the Test Procedures, and are applicable to engines tested only for exhaust emissions. The production line test procedures are specified in conjunction with the Test Procedures. An engine is in compliance with these production line standards and test procedures only when all portions of these production line test procedures and specified requirements from the Test Procedures are fulfilled, except any adjustable engine parameters may be set to any value or position that is within the range available to the ultimate purchaser.

(B) Air Resources Board (ARB) personnel and mobile laboratories must 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 must be arranged with the designated engine manufacturer's representative and must not unreasonably disturb normal operations (See Test Procedures).

(2) Engine Sample Selection.

(A) At the start of each quarter for the model year, the engine manufacturer will begin to randomly select engines from each engine family for production line testing, according to the criteria specified herein. The engines must be representative of the engine manufacturer's California sales. Each engine will be selected from the end of the assembly line. All engine models within the engine family must be included in the sample pool. Each selected engine for production line testing must pass the inspection test, by being equipped with the appropriate emission control systems certified by the

ARB. The procedure for randomly selecting engines or units of equipment must be submitted to the Chief, Mobile Source Operations Division, 9528 Telstar Avenue, El Monte, CA, 91731, prior to the start of production for the first year of production.

(i) For newly certified engine families: After two engines are tested, the manufacturer will calculate the required sample size for the model year according to the Sample Size Equation in paragraph (4) of this subsection.

(ii) For carry-over engine families: After one engine is tested, the manufacturer will combine the test with the last test result from the previous model year and then calculate the required sample size for the model year according to the Sample Size Equation in paragraph (4) of this subsection.

(iii) Beginning with the 2006 model year, a manufacturer may annually request of the Executive Officer a reduction in production line testing for an engine family. In making such request, the manufacturer must demonstrate that the engine family's production line test data is consistent and in-use compliance data is consistent for the previous year(s) and in compliance with the emission standards in Section 2433. If the Executive Officer determines that a reduction is warranted, the manufacturer may test as few as one production engine during the subject model year.

(B) Engine manufacturers must provide actual California sales, or other information acceptable to the Executive Officer, including, but not limited to, an estimate based on market analysis and federal production or sales.

### (3) Engine Preparation and Preconditioning

(A) No emissions tests may be performed on an engine prior to the first production line test.

(B) The engine or unit of equipment must be tested after the engine manufacturer's recommended break-in period. The engine manufacturer must submit to the Executive Officer the schedule for engine break-in and any changes to the schedule with each quarterly report. This schedule must be adhered to for all production line testing within an engine family and subgroup or engine family and assembly plant as appropriate.

(C) If an engine or unit of equipment is shipped to a remote facility for production line testing, and adjustment or repair is necessary because of such shipment, the engine manufacturer must perform the necessary adjustments or repairs only after the initial test of the engine or equipment. Engine manufacturers must report to the Executive Officer in the quarterly report, all adjustments or repairs performed on engines or equipment prior to each test. In the event a retest is performed, a request may be made to the Executive Officer, within ten days of the production quarter, for permission to substitute the after-repair test results for the original test results. The Executive Officer will either affirm or deny the request by the engine manufacturer within ten working days from receipt of the request.

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

(4)(A) Manufacturers will calculate the required sample size for the model year for each engine family using the Sample Size Equation below. N is calculated from each test result. The number N indicates the number of tests required for the model year for an engine family. N, is recalculated after each test. Test results used to calculate the variables in the Sample Size Equation must be final deteriorated test results as specified in (d)(3).

$$N = \left[ \frac{(t_{95} \times \sigma)}{(x - STD)} \right]^2 + 1$$

Where:

N = required sample size for the model year.

t<sub>95</sub> = 95% confidence coefficient. It is dependent on the number of tests

completed, n, as specified in the table in paragraph (C) of this section. It defines one-tail, 95% confidence intervals.

σ = test sample standard deviation calculated from the following equation:

$$\sigma = \sqrt{\frac{\sum (X_i - x)^2}{n - 1}}$$

Where:

X<sub>i</sub> = emission test result for an individual engine

x = mean of emission test results of the sample

STD = emission standard

n = The number of tests completed in an engine family

(B) Reserved

(C) Number of Tests (n) & 1-tail Confidence Coefficients (t<sub>95</sub>)

n t<sub>95</sub> n t<sub>95</sub> n t<sub>95</sub>

2	6.31	12	1.80	22	1.72
3	2.92	13	1.78	23	1.72
4	2.35	14	1.77	24	1.71
5	2.13	15	1.76	25	1.71
6	2.02	16	1.75	26	1.71
7	1.94	17	1.75	27	1.71
8	1.90	18	1.74	28	1.70
9	1.86	19	1.73	29	1.70
10	1.83	20	1.73	30	1.70
11	1.81	21	1.72	<<infinity>>	1.645

(D) A manufacturer must distribute the testing of the remaining number of engines needed to meet the required sample size N, evenly throughout the remainder of the model year.

(E) After each new test, the required sample size, N, is recalculated using updated sample means, sample standard deviations and the appropriate 95% confidence coefficient.

(F) A manufacturer must continue testing and updating each engine family's sample size calculations according to paragraphs (4)(A) through (4)(F) of this section until a decision is made to stop testing as described in paragraph (4)(G) of this section or a noncompliance decision is made pursuant to (c)(6).

(G) If, at any time throughout the model year, the calculated required sample size, N, for an engine family is less than or equal to the sample size, n, and the sample mean, x, for HC + NOx is less than or equal to the emission standard, the manufacturer may stop testing that engine family.

(H) If, at any time throughout the model year, the sample mean, x, for HC + NOx is greater than the emission standard, the manufacturer must continue testing that engine family at the appropriate maximum sampling rate.

(I) The maximum required sample size for an engine family (regardless of the required sample size, N, as calculated in paragraph (4)(A) of this section) is thirty tests per model year.

(J) Manufacturers may elect to test additional randomly chosen engines. All additional randomly chosen engines tested in accordance with the testing procedures specified in Emission Standards and Test Procedures must be included in the Sample Size and Cumulative Sum equation calculations as defined in section (b), respectively.

(K) Small volume manufacturers may limit the number of engines tested to one percent of their California production. Compliance would be determined based on the available test data.

(5) The manufacturer must produce and assemble the test engines using its normal production and assembly process for engines to be distributed into commerce.

(6) No quality control, testing, or assembly procedures will be used on any test engine or any portion thereof, including parts and subassemblies, that have not been or will not be used during the production and assembly of all other engines of that family, unless the Executive Officer approves the modification in production or assembly procedures.

(c) Calculation of Cumulative Sum (CumSum) Statistic. Each engine manufacturer must review the test results using the following procedure:

(1) Manufacturers must construct the following CumSum equation for each regulated pollutant for each engine family. Test results used to calculate the variables in the CumSum Equation must be final deteriorated test results as defined in (d)(3).

$$C_i = \max[0 \text{ OR } ( C_{i-1} + X_i -(\text{STD} + F) ) ]$$

Where:

$C_i$  = The current CumSum statistic

$C_{i-1}$  = The previous CumSum statistic. Prior to any testing, the CumSum statistic = 0 (i.e.  $C_0 = 0$ )

$X_i$  = The current emission test result for an individual engine

STD = Emission standard

F = 0.25 x

(2) After each test,  $C_i$  is compared to the action limit, H, the quantity which the CumSum statistic must exceed, in two consecutive tests, before the engine family may be determined to be in noncompliance for purposes of paragraph (c).

H = The Action Limit. It is  $5.0 \times \langle\langle\sigma\rangle\rangle$ , and is a function of standard deviation,  $\langle\langle\sigma\rangle\rangle$

$\langle\langle\sigma\rangle\rangle$  = is the sample standard deviation and is recalculated after each test.

(3) After each engine is tested, the CumSum statistic shall be promptly updated according to the CumSum Equation in paragraph (1) of this subsection.

(4) If, at any time during the model year, a manufacturer amends the application for certification for an engine family as specified in Sections 17 and 18 of the Test Procedures by performing an engine family modification (i.e. a change such as a running change involving a physical modification to an engine, a change in specification or setting, the addition of a new configuration, changes in calibration, or the use of a

different deterioration factor), all previous sample size and CumSum statistic calculations for the model year will remain unchanged.

(5) A failed engine is one whose final deteriorated test result for a regulated pollutant exceeds the emission standard for that pollutant.

(6) An engine family may be determined to be in noncompliance, if at any time throughout the model year, the CUMSUM statistic,  $C_i$ , for a regulated pollutant is greater than the action limit, H, for two consecutive tests.

(7) The engine manufacturer must perform a minimum of two (2) tests per engine family per quarter of production, regardless of whether the conditions of sample size have been met.

(8) All results from the previous quarters of the same model year must be included in the on-going Cumulative Sum analysis, provided that the engine family has not failed (e.g., if three engines of a family were tested in the first quarter, the first test of the second quarter would be considered as the fourth test).

(9) If the Cumulative Sum analysis indicates that an engine family has failed, the engine manufacturer must notify the Chief of the Mobile Source Operations Division in writing and by telephone, within ten (10) working days. Corrective action will be taken as noted in paragraphs (e) and (f) below.

(10) If a manufacturer performs corrective action on a failed engine family and then resumes production, all previous tests will be void, and Cumulative Sum analysis will begin again with the next test.

(11) At the end of the quarter, or when the Cumulative Sum analysis indicates that a decision has been made, the manufacturer must provide all the data accumulated during the quarter.

(d) Calculation and reporting of test results.

(1) Initial test results are calculated following the applicable test procedure. The manufacturer rounds these results, in accordance with ASTM E29-93a, to the number of decimal places contained in the applicable emission standard expressed to one additional significant figure. (ASTM E29-93a has been incorporated by reference.)

(2) Final test results are calculated by summing the initial test results derived in paragraph (a) of this section for each test engine, dividing by the number of tests conducted on the engine, and rounding in accordance with ASTM E29-93a to the same number of decimal places contained in the applicable standard expressed to one additional significant figure.

(3) The final deteriorated test results for each test engine are calculated by applying the appropriate deterioration factors, derived in the certification process for the engine

family, to the final test results, and rounding in accordance with ASTM E29-93a to the same number of decimal places contained in the applicable standard expressed to one additional significant figure.

(4) If, at any time during the model year, the CumSum statistic exceeds the applicable action limit, H, in two consecutive tests, the engine family may be determined to be in noncompliance and the manufacturer must notify the Chief of Mobile Sources Operations Division and the Manager of the New Vehicle Audit Section, 9528 Telstar Ave., El Monte, CA 91731, within ten (10) working days of such exceedance by the Cum Sum statistic.

(5) Within 30 calendar days of the end of each quarter, each engine manufacturer must submit to the Executive Officer a report which includes the following information:

(A) The location and description of the manufacturer's or other's exhaust emission test facilities which were utilized to conduct testing reported pursuant to this section;

(B) Total production and sample sizes, N and n, for each engine family;

(C) The applicable emissions standards for each engine family.

(D) A description of the process to obtain engines on a random basis;

(E) A description of the test engines. (i.e., date of test, engine family, engine size, engine or equipment identification number, fuel system, dynamometer power absorber setting in horsepower, engine code or calibration number, and test location).

(F) The date of the end of the engine manufacturer's model year production for each engine family.

(G) For each test conducted,

(i) A description of the test engine, including:

(a) Configuration and engine family identification,

(b) Year, make, and build date,

(c) Engine identification number, and

(d) Number of hours of service accumulated on engine prior to testing;

(ii) Location where service accumulation was conducted and description of accumulation procedure and schedule;

(iii) Test number, date, test procedure used, initial test results before and after rounding, and final test results for all exhaust emission tests, whether valid or invalid, and the reason for invalidation, if applicable;

(iv) A complete description of any adjustment, modification, repair, preparation, maintenance, and/or testing which was performed on the test engine, was not reported pursuant to any other part of this article, and will not be performed on all other production engines;

(v) The exhaust emission data for HC+NO<sub>x</sub> (or NMHC+NO<sub>x</sub>, as applicable) and CO for each test engine or equipment. The data reported must provide two significant figures beyond the number of significant figures in applicable emission standards.

(vi) The retest emission data, as described in paragraph (d) above for any engine or unit of equipment failing the initial test, and description of the corrective actions and measures taken, including specific component replaced or adjusted.

(vii) A CumSum analysis, as required in paragraph (c), of the production line test results for each engine family;

(viii) Any other information the Executive Officer may request relevant to the determination whether the new engines being manufactured by the manufacturer do in fact conform with the regulations with respect to which the Executive Order was issued;

(ix) For each failed engine as defined in paragraph (c), a description of the remedy and test results for all retests.

(x) Every aborted test data and reason for the aborted test.

(xi) The start and stop dates of batch-produced engine family production.

(xii) The required information for all engine families in production during the quarter regardless of sample size; and

(xiii) The following signed statement and endorsement by an authorized representative of the manufacturer:

This report is submitted pursuant to this article. This production line testing program was conducted in complete conformance with all applicable regulations under the Test Procedures. No emission-related changes to production processes or quality control procedures for the engine family tested have been made during this production line testing program that affect engines from the production line. All data and information reported herein is, to the best of (Company Name) knowledge, true and accurate. I am aware of the penalties associated with violations of the California Code of Regulations and the regulations thereunder. (Authorized Company Representative.)

(H) Each manufacturer must submit a copy of the report that has been stored (e.g., computer disc), or may be transmitted, in an electronically digitized manner, and in a format that is specified by the Executive Officer. This electronically based submission is in addition to the written submission of the report.

(e) Manufacturer Notification of Failure.

(1) The Executive Officer will notify the engine manufacturer that the engine manufacturer may be subject to revocation or suspension of the Executive Order authorizing sales and distribution of the noncompliant engines in the State of California, or being enjoined from any further sales, or distribution, of the noncompliant engines in the State of California pursuant to Section 43017 of the Health and Safety Code. Prior to revoking or suspending, or seeking to enjoin an engine manufacturer, and other interested parties, including, but not limited to corrective actions applied to the noncompliant engine family. In addition, the engine manufacturer may be subject to, on a per engine basis, any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

(2) The Executive Officer will notify the equipment manufacturer that the equipment manufacturer may be subject to revocation or suspension of the Executive Order authorizing sales and distribution of the noncompliant equipment in the State of California, or being enjoined from any further sales, or distribution, of the noncompliant equipment product line(s) that are, or utilize engines that are, noncompliant with the applicable emission regulations in the State of California pursuant to Section 43017 of the Health and Safety Code. Prior to revoking or suspending, or seeking to enjoin an equipment manufacturer, and other interested parties, including, but not limited to corrective actions applied to the noncompliant engine family. In addition, the equipment manufacturer may be subject to, on a per engine basis, any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

(f) Suspension and revocation of Executive Order.

(1) The Executive Order is automatically suspended with respect to any engine failing pursuant to paragraph (c)(5) effective from the time that testing of that engine family is completed.

(2) The Executive Officer may suspend the Executive Order for an engine family which is determined to be in noncompliance pursuant to paragraph (c)(6). This suspension will not occur before fifteen days after the engine family is determined to be in noncompliance.

(3) If the results of testing pursuant to these regulations indicate that engines of a particular family produced at one plant of a manufacturer do not conform to the regulations with respect to which the Executive Order was issued, the Executive Officer may suspend the Executive Order with respect to that family for engines manufactured by the manufacturer at this and all other plants.

(4) Notwithstanding the fact that engines described in the application for certification may be covered by an Executive Order, the Executive Officer may suspend such certificate immediately in whole or in part if the Executive Officer finds any one of the following infractions to be substantial:

(A) The manufacturer refuses to comply with any of the requirements of this subpart.

(B) The manufacturer submits false or incomplete information in any report or information provided to the Executive Officer under this subpart.

(C) The manufacturer renders inaccurate any test data submitted under this subpart.

(D) An ARB enforcement officer is denied the opportunity to conduct activities authorized in this subpart and a warrant or court order is presented to the manufacturer or the party in charge of the facility in question.

(5) The Executive Officer may suspend such certificate immediately in whole or in part if the Executive Officer finds that an ARB enforcement officer is unable to conduct activities authorized in this Section and the Test Procedures because a manufacturer has located its facility in a foreign jurisdiction where local law prohibits those activities.

(6) The Executive Officer shall notify the manufacturer in writing of any suspension or revocation of an Executive Order in whole or in part. A suspension or revocation is effective upon receipt of the notification or fifteen days from the time an engine family is determined to be in noncompliance pursuant to paragraph (c)(5) or (c)(6), whichever is later, except that the certificate is immediately suspended with respect to any failed engines as provided for in paragraph (a) of this section.

(7) The Executive Officer may revoke an Executive Order for an engine family after the certificate has been suspended pursuant to paragraph (b) or (c) of this section if the proposed remedy for the nonconformity, as reported by the manufacturer to the Executive Officer, is one requiring a design change or changes to the engine or emission control system as described in the application for certification of the affected engine family.

(8) Once an Executive Order has been suspended for a failed engine, as provided for in paragraph (a) of this section, the manufacturer must take the following actions before the certificate is reinstated for that failed engine:

(A) Remedy the nonconformity;

(B) Demonstrate that the engine conforms to the emission standards by retesting the engine in accordance with these regulations; and

(C) Submit a written report to the Executive Officer, after successful completion of testing on the failed engine, which contains a description of the remedy and test results for each engine in addition to other information that may be required by this part.

(9) Once an Executive Order for a failed engine family has been suspended pursuant to paragraph (b), (c) or (d) of this section, the manufacturer must take the following actions before the Executive Officer will consider reinstating the certificate:

(A) Submit a written report to the Executive Officer which identifies the reason for the noncompliance of the engines, describes the proposed remedy, including a description of any proposed quality control or quality assurance measures to be taken by the manufacturer to prevent future occurrences of the problem, and states the date on which the remedies will be implemented.

(B) Demonstrate that the engine family for which the Executive Order has been suspended does in fact comply with the regulations of this part by testing as many engines as needed so that the CumSum statistic falls below the action limit. Such testing must comply with the provisions of this Part. If the manufacturer elects to continue testing individual engines after suspension of a certificate, the certificate is reinstated for any engine actually determined to be in conformance with the emission standards through testing in accordance with the applicable test procedures, provided that the Executive Officer has not revoked the certificate pursuant to paragraph (f) of this section.

(10) Once the Executive Order has been revoked for an engine family, if the manufacturer desires to continue introduction into commerce of a modified version of that family, the following actions must be taken before the Executive Officer may issue a certificate for that modified family:

(A) If the Executive Officer determines that the proposed change(s) in engine design may have an effect on emission performance deterioration, the Executive Officer shall notify the manufacturer, within five working days after receipt of the report in paragraph (9)(A) of this section, whether subsequent testing under this subpart will be sufficient to evaluate the proposed change or changes or whether additional testing will be required; and

(B) After implementing the change or changes intended to remedy the nonconformity, the manufacturer must demonstrate that the modified engine family does in fact conform with the regulations of this part by testing as many engines as needed from the modified engine family so that the CumSum statistic, as calculated per aforementioned method, falls below the action limit. When both of these requirements are met, the Executive Officer shall reissue the certificate or issue a new certificate, as the case may be, to include that family. As long as the CumSum statistic remains above the action limit, the revocation remains in effect.

(11) At any time subsequent to a suspension of an Executive Order for a test engine pursuant to paragraph (a) of this section, but not later than 15 days (or such other period as may be allowed by the Executive Officer) after notification of the Executive Officer's decision to suspend or revoke an Executive Order in whole or in part pursuant to paragraphs (b), (c), or (f) of this section, a manufacturer may request a hearing as to

whether the tests have been properly conducted or any sampling methods have been properly applied.

(12) Any suspension of an Executive Order under paragraph (f)(4) of this section:

(A) must be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with all applicable requirements and;

(B) need not apply to engines no longer in the possession of the manufacturer.

(13) After the Executive Officer suspends or revokes an Executive Order pursuant to this section and prior to the commencement of a hearing, if the manufacturer demonstrates to the Executive Officer's satisfaction that the decision to suspend or revoke the Executive Order was based on erroneous information, the Executive Officer shall reinstate the Executive Order.

(14) To permit a manufacturer to avoid storing non-test engines while conducting subsequent testing of the noncomplying family, a manufacturer may request that the Executive Officer conditionally reinstate the Executive Order for that family. The Executive Officer may reinstate the Executive Order subject to the following condition: the manufacturer must commit to recall all engines of that family produced from the time the Executive Order is conditionally reinstated if the CumSum statistic does not fall below the action limit and must commit to remedy any nonconformity at no expense to the owner.

■§ 2438. In-Use Compliance Program.

(a) This section applies to new 2004 and later model year off-road large spark-ignition engines with engine displacement greater than 1.0 liter.

(b) Manufacturer In-Use Testing Program.

Standards and Test Procedures. The emission standards, exhaust sampling and analytical procedures are those described in the Test Procedures, and are applicable to engines tested only for exhaust emissions. An engine is in compliance with these standards and test procedures only when all portions of these in-use test procedures and specified requirements from the Test Procedures are fulfilled, except that any adjustable engine parameters must be set to the nominal value or position as indicated on the engine label.

(1) Within a manufacturer's model-year engine production period, the ARB will identify those engine families, and the specific configurations within an engine family, that the manufacturer must subject to in-use testing as described below. For each model year, ARB may identify a number of engine families that is no greater than 25 percent of the number of engine families to which this article is applicable. For those manufacturers producing three or less engine families in a model year, ARB may designate a maximum of one engine family per model year for in-use testing.

(2) For each engine family identified by ARB, engine manufacturers must perform emission testing of an appropriate sample of in-use engines from each engine family. Manufacturers must submit data from this in-use testing to ARB.

(3) An engine manufacturer must test in-use engines from each engine family identified by ARB. All engines selected by the manufacturer for testing must be identified by the manufacturer, and a list of the selected engines must be submitted to the Executive Officer, prior to the onset of testing. Engines to be tested must have accumulated a minimum of 0.50 (50 percent) of the family's certified useful life period. The number of engines to be tested by a manufacturer will be determined by the following method:

(A) a minimum of four engines per family, provided that no engine fails any emission standard. For each exceedance, two additional engines must be tested until the total number of engines equals ten.

(B) For engine families of less than 500 engines (national production) for the identified model year or for engine manufacturers who make less than or equal to 2,000 engines nationally for that model year, a minimum of two (2) engines per family provided that no engine fails any emission standard. For each failing engine, two more engines shall be tested until the total number of engines equals ten (10).

(C) If an engine family was certified using carryover emission data and has been previously tested under paragraphs (b)(3)(A) or (b)(3)(B) of this section (and a recall for that family has not occurred), then only one engine for that family must be tested. If that one engine fails any emission standard, testing must be conducted as outlined in subsections (b)(3)(A) or (b)(3)(B), whichever is appropriate.

(4) The Executive Officer may approve an alternative to manufacturer in-use testing, where:

(A) Engine family production is less than or equal to 200 per year, nationally;

(B) Engines cannot be obtained for testing because they are used substantially in vehicles or equipment that are not conducive to engine removal such as large vehicles or equipment from which the engine cannot be removed without dismantling either the engine, vehicle, or equipment; or

(C) Other compelling circumstances associated with the structure of the industry and uniqueness of engine applications. Such alternatives shall be designed to determine whether the engine family is in compliance.

(5) The engine manufacturer shall procure in-use engines which have been operated between 0.50 and 1.0 times the certified engine's useful life period. The engine manufacturer may test engines from more than one model year in a given year. The manufacturer shall submit a plan for testing within twelve calendar months after

receiving notice that ARB has identified a particular engine family for testing and shall complete testing of such engine family within 24 calendar months from the date of approval of the plan by ARB. Test engines may be procured from sources associated with the engine manufacturer (i.e., manufacturer-established fleet engines, etc.) or from sources not associated with the manufacturer (i.e., consumer-owned engines, independently owned fleet engines, etc.).

(c) Maintenance, procurement and testing of in-use engines.

(1) A test engine must have a maintenance and use history representative of in-use conditions.

(A) To comply with this requirement a manufacturer must obtain information from the end users regarding the accumulated usage, maintenance, repairs, operating conditions, and storage of the test engines.

(B) Documents used in the procurement process must be maintained as required.

(2) The manufacturer may perform minimal restorative maintenance on components of a test engine that are not subject to parameter adjustment. Maintenance may include only that which is listed in the owner's instructions for engines with the amount of service and age of the acquired test engine. Repairs may be performed on a test engine with prior Executive Officer approval. Documentation of all maintenance, repairs, defects, and adjustments shall be maintained and retained as required.

(3) At least one valid emission test, according to the Test Procedure, is required for each in-use engine.

(4) The Executive Officer may waive portions or requirements of the test procedure, if any, that are not necessary to determine in-use compliance.

(5) If a selected in-use engine fails to comply with any applicable emission standards, the manufacturer shall determine the reason for noncompliance. The manufacturer must report within 72 hours after the completion of the test specifying the emission results and identifying the pollutant which failed to comply with the emission standard. The manufacturer must report all such reasons of noncompliance within fifteen business days of completion of testing. Additional time beyond the initial fifteen days may be granted providing that the manufacturer receives prior approval from the Executive Officer. The reports may be filed electronically or mailed to the following address: Chief of Mobile Source Operations Division, 9528 Telstar Avenue, El Monte, CA 91731.

(6) At the discretion of the Executive Officer, an engine manufacturer may test more engines than the minima described in paragraph (b)(3) of this section or may concede failure before testing a total of ten engines. Upon conceding failure the manufacturer shall proceed with a voluntary recall program as specified in Section 2439.

(7) The Executive Officer will consider failure rates, average emission levels and the existence of any defects, among other factors, in determining whether to pursue remedial action under this subpart. The Executive Officer may order a recall pursuant to Section 2439 before testing reaches the tenth engine whenever the Executive Officer has determined, based on production-line test results or in-use test results, enforcement testing results, or any other information, that a substantial number of a class or category of equipment or engines produced by that manufacturer, although properly maintained and used, contain a failure in an emission-related component which, if uncorrected, may result in the equipments' or engines' failure to meet applicable standards over their useful lives; or whenever a class or category of equipment or engines within their useful lives, on average, do not conform to the emission standards prescribed pursuant to 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, as applicable to the model year of such equipment or engines.

(8) Prior to an ARB-ordered recall, the manufacturer may perform a voluntary emissions recall pursuant to Article 4.5, Section 2439(b). Such manufacturer is subject to the reporting requirements in subsection (d) below.

(9) Once ARB determines that a substantial number of engines fail to conform with the requirements, the manufacturer will not have the option of a voluntary emissions recall.

(d) In-use test program reporting requirements.

(1) The manufacturer shall electronically submit to the Executive Officer within three months of completion of testing all emission testing results generated from the in-use testing program. The following information must be reported for each test engine:

(A) engine family,

(B) model,

(C) engine serial number or alternate identification, as applicable,

(D) date of manufacture,

(E) estimated hours of use,

(F) date and time of each test attempt,

(G) results (if any) of each test attempt,

(H) results of all emission testing,

(I) summary of all maintenance, repairs, and adjustments performed,

(J) summary (if any) of all ARB pre-approved modifications and repairs,

(K) determinations of noncompliance or compliance.

(2) The manufacturer must electronically submit the results of its in-use testing with a pre-approved information heading. The Executive Officer may exempt manufacturers from this requirement upon written request with supporting justification.

(3) All testing reports and requests for approvals made under this subpart shall be sent to the Executive Officer.

(4) The Executive Officer may require modifications to a manufacturer's in-use testing programs.

(e) In-use emissions credit, averaging, banking, and trading program.

(1) General applicability

(A) The in-use credit program for eligible engines is described in this subsection. Participation in this program is voluntary.

(B) An engine family is eligible to participate in the in-use credit program if it is subject to regulation under Section 2433 of this part with certain exceptions specified in paragraph (C).

(C) Engines may not participate in the in-use averaging, banking, and trading program if they are delivered to a "point of first retail sale" outside of California.

(D) Reserved.

(E) An engine family with a compliance level, as determined by in-use testing below, the applicable emission standards to which the engine family is certified may generate emission credits for averaging, banking, or trading in the in-use credit program.

(F) Positive credits generated in a given model year may be used in that model year or in any subsequent model year.

(G) A manufacturer of an engine family with a compliance level exceeding the applicable emission standards to which the engine family is certified, may, prior to the date of the report use previously banked credits, purchase credits from another manufacturer, or perform additional testing to address the associated credit deficit (negative credits or a need for credits).

(H) Reserved.

(I) A manufacturer must notify the Executive Officer of plans to test additional engine families beyond the maximum 25% required for the in-use testing program. Such notice

must be submitted to the Executive Officer 30 days prior to initiation of testing. If the additional testing discovers an engine family to be in noncompliance with the applicable emission standards, the testing must be treated as if it were a failure of the normal in-use testing requirement of an engine family.

(J) Manufacturers must demonstrate a zero or positive credit balance under the in-use credit program for a particular model year within 90 days of the end of the in-use testing of that model year's engine families.

(2) Engines subject to the 2004 and later model-year emission standards are eligible to participate in the in-use credit program.

(3) The definitions below shall apply to this subsection:

(A) Averaging means the exchange of in-use emission credits among LSI engine families within a given manufacturer's product line.

(B) Banked credits refer to positive emission credits based on applicable actual production or sales volume as contained in the end of model year in-use testing reports submitted to Executive Officer of the ARB. Some or all of these banked credits may be revoked if the Executive Officer's review of the end of model year in-use testing reports or any subsequent audit action(s) uncovers problems or errors.

(C) Banking means the retention of in-use emission credits by the manufacturer generating the emission credits for use in future model year averaging or trading as permitted by these regulations.

(D) Carry-over engine family means an engine family which undergoes certification using carryover test data from previous model years.

(E) Compliance level for an engine family is determined by averaging the in-use test results from each engine.

(F) In-use credits represent the amount of emission reduction or exceedance, for each regulated pollutant, by an engine family below or above, respectively, the applicable emission standards. Emission reductions below the emission standard are considered "positive credits," while emission exceedances above the emission standard are considered "negative or required credits."

(G) Trading means the exchange of in-use emission credits between manufacturers or brokers.

(4) Averaging.

(A) A manufacturer may use averaging across engine families to demonstrate a zero or positive credit balance for a model year. Positive credits to be used in averaging may be

obtained from credits generated by another engine family of the same model year, credits banked in previous model years, or credits obtained through trading.

(B) Credits used to demonstrate a zero or positive credit balance must be used at a rate of 1.1 to 1.

(5) Banking.

(A) A manufacturer of an engine family with an in-use compliance level below the applicable emission standards for a given model year may bank positive in-use credits for that model year for in-use averaging and trading.

(B) A manufacturer may consider credits banked 30 days after the submission of the report. During the 30 day period ARB will work with the manufacturer to correct any error in calculating banked credits, if necessary.

(6) Trading.

(A) An engine manufacturer may exchange positive in-use emission credits with other LSI engine manufacturers through trading.

(B) In-use credits for trading can be obtained from credits banked for model years prior to the model year of the engine family requiring in-use credits.

(C) Traded in-use credits can be used for averaging, banking, or further trading transactions.

(D) Unless otherwise approved by the Executive Officer, a manufacturer that generates positive in-use credits must wait 30 days after it has both completed in-use testing for the model year for which the credits were generated and submitted the report before it may transfer credits to another manufacturer or broker.

(E) In the event of a negative credit balance resulting from a transaction, both the buyer and the seller are liable, except in cases involving fraud. Engine families participating in a negative trade may be subject to recall under section 2439 of this article.

(7) Credit Calculation.

(A) For each participating engine family, emission credits (positive or negative) are to be calculated according to the following equation and rounded, in accordance with ASTM E29-93a, to the nearest gram. ASTM E29-93a has been incorporated by reference. Consistent units are to be used throughout the equation. The following equation is used to determine the credit status for an engine family whether generating positive or negative in-use emission credits:

$$\text{Credits (grams)} = \text{SALES} \times (\text{STD} - \text{CL}) \times \text{POWER} \times \text{AF} \times \text{LF} \times \text{UL}$$

Where:

SALES = the number of eligible sales tracked to the point of first retail sale in the U.S. for the given engine family during the model year.

STD = the emission standard or family emission level in g/bhp-hr or g/kW-hr, as appropriate and as noted in California Code of Regulations, Title 13, Section 2433.

CL = compliance level of the in-use testing in g/bhp-hr or g/kW-hr, as appropriate as approved by ARB.

UL = useful life in hours (5000 hours for engines with displacement) greater than 1.0 liter.

Power = the average power of an engine family in bhp or kW (sales weighted). The power of each configuration is the rated output in horsepower as determined by SAE J1349 (June 1995) or J1995 (June 1995), as applicable. These procedures have been incorporated by reference.

LF = Load factor; Fraction of rated engine power utilized in-use (0.32 for engines with displacement greater than 1.0 liter).

AF = adjustment factor for the number of tests conducted, as determined from the following table, except that when a manufacturer concedes failure before completion of testing, the adjustment factor shall be 1.0:

Number of Engines Tested	Adjustment Factor
2*, 4	0.5
6	0.75
8	0.9
10	1.0

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\*Small volume manufacturer

(B) Any credits used for either averaging, banking, or trading shall be assessed a one-time discount of 10 percent.

(8) Maintenance of records.

(A) Any manufacturer that is participating in the in-use credit program set forth in this subsection shall establish, maintain, and retain the records with respect to its participation in the in-use credit program.

(B) The Executive Officer may void an Executive Order for an engine family for which the manufacturer fails to retain the records required under this section or to provide such information to the Executive Officer or designee upon request.

(9) Reporting requirements.

(A) Any manufacturer who participates in the in-use credit program is required to submit an end of the model year in-use testing report either within 90 days of the end of the model year in-use testing of a given model year's engine families, or at the same time as the final certification averaging, banking, and trading report, whichever is later. The end of the model year in-use testing report must contain the required information and show the calculated credits from all the in-use testing conducted by the manufacturer for a given model year.

(B) Reports shall be submitted to the Chief of the Mobile Source Operations Division.

(C) A manufacturer that fails to submit a timely report as required will be considered to not have participated in the in-use credit program.

(D) If the Executive Officer or the manufacturer determines that a reporting error occurred on an end of model year report previously submitted to ARB under this subsection, or an engine family in-use testing report submitted to ARB, the manufacturer's credits and credit calculations will be recalculated. Erroneous positive credits will be void. Erroneous negative credits may be adjusted by the Executive Officer. An update of previously submitted "point of first retail sale" information is not considered an error and no increase in the number of credits will be allowed unless an error occurred in the calculation of credits due to an error in the "point of first retail sale" information from the time of the original end of model year report.

(10) Notice of Opportunity for Hearing.

Any voiding of an engine family's Executive Order will occur only after the manufacturer concerned has been offered an opportunity for a hearing. The Executive Officer must approve or disapprove the documents required by this Section within 90 days of the date such documents are received from the manufacturer. Any disapproval must be accompanied by a statement of the reasons therefor. In the event of disapproval, the manufacturer may file for an adjudicative hearing under Title 17, California Code of Regulation, Division 3, Chapter 1, Subchapter 1.25 to review the decision of the Executive Officer.

■§ 2439. Procedures for In-Use Engine Recalls for Large Off-Road Spark-Ignition Engines with an Engine Displacement Greater Than 1.0 Liter.

(a) The recall procedures in this section apply as set forth in Title 13, California Code of Regulations, Sections 2433 and 2438.

(b) Voluntary Emissions Recall

(1) When any manufacturer initiates a voluntary emission recall, the manufacturer shall notify the Executive Officer of the recall at least 30 days before owner notification is to begin. The manufacturer shall also submit to the Executive Officer a voluntary recall plan for approval, as prescribed in the following:

(A)(i) a description of each class or category of engines to recall, including the number of engines to be recalled, the engine family or a sub-group thereof, the model year, and such other information as may be required to identify the engines:

(ii) a description of the specific modifications, alterations, repairs, corrections, adjustments, or other changes to be made to correct the engines affected by the nonconformity;

(iii) a description of the method by which the manufacturer will notify engine owners including copies of any letters of notification to be sent to engine owners;

(iv) a description of the proper maintenance or use, if any, upon which the manufacturer conditions eligibility for repair under the recall plan, and a description of the proof to be required of an engine owner to demonstrate compliance with any such conditions;

(v) a description of the procedure to be followed by engine owners to obtain correction of the nonconformity. This shall include designation of the date on or after which the owner can have the nonconformity remedied, the time reasonably necessary to perform the labor to remedy the nonconformity, and the designation of facilities at which the nonconformity can be remedied;

(vi) a description of the class of persons other than dealers and authorized warranty agents of the manufacturer who will remedy the nonconformity;

(vii) a description of the system by which the manufacturer will assure that an adequate supply of parts is available to perform the repair under the plan; or

(B)(i) a description of each class or category of engines subject to recall, including the number of engines subject to being recalled, the engine family or a sub-group thereof, the model year, and such other information as may be required to identify the engines;

(ii) a description of the method by which the manufacturer will use the in-use emissions credit, averaging, banking, and trading program, as described in Section 2438(e), to remedy the nonconformity.

(2) Voluntary Recall Progress Report. A manufacturer who initiates a voluntary emission recall campaign pursuant to paragraph (b)(1)(A) of this section must submit at least one report on the progress of the recall campaign. This report shall be submitted to the Executive Officer by the end of the fifth quarter, as defined in Section 2112(j), Chapter 2, Title 13 of the California Code of Regulations, following the quarter in which the notification of equipment or engine owners was initiated, and include the following information:

(A) Engine family involved and recall campaign number as designated by the manufacturer.

(B) Date owner notification was begun, and date completed.

(C) Number of equipment or engines involved in the recall campaign.

(D) Number of equipment or engines known or estimated to be affected by the nonconformity.

(E) Number of equipment or engines inspected pursuant to the recall plan and found to be affected by the nonconformity.

(F) Number of inspected equipment or engines.

(G) Number of equipment or engines receiving repair under the recall plan.

(H) Number of equipment or engines determined to be unavailable for inspection or repair under the recall plan due to exportation, theft, scrapping, or for other reasons (specify).

(I) Number of equipment or engines determined to be ineligible for recall action due to removed or altered components.

(J) A listing of the identification numbers of equipment or engines subject to recall but for whose repair the manufacturer has not been invoiced. This listing shall be supplied in a standardized computer data storage device to be specified by the Executive Officer.

(K) Any service bulletins transmitted to dealers which relate to the nonconformity and which have not previously been submitted.

(L) All communications transmitted to equipment or engine owners which relate to the nonconformity and which have not previously been submitted.

(3) The information gathered by the manufacturer to compile the reports must be retained for not less than seven years from the date of the manufacture of the engines and must be

made available to the Executive Officer or designee of the Executive Officer upon request.

(4) A voluntary recall plan shall be deemed approved unless disapproved by the Executive Officer within 20 business days after receipt of the recall plan.

(5) Under a voluntary recall program, initiated and conducted by a manufacturer or its agent or representative as a result of in-use enforcement testing or other evidence of noncompliance provided or required by the Board to remedy any nonconformity, the capture rate shall be at a minimum 55 percent of the equipment or engine within the subject engine family or a sub-group thereof. The manufacturer shall comply with the capture rate by the end of the fifth quarter, as defined in Section 2112(j), Chapter 2, Title 13 of the California Code of Regulations, following the quarter in which the notification of equipment or engine owners was initiated. If the manufacturer cannot correct the percentage of equipment specified in the plan by the applicable deadlines, the manufacturer must use good faith efforts through other measures, subject to approval by the Executive Officer, to bring the engine family into compliance with the standards. If the Executive Officer does not approve the manufacturer's efforts, the manufacturer shall propose mitigation measures to offset the emissions of the unrepaired equipment within 45 days from the last report filed pursuant to paragraph (b)(2), above. The Executive Officer shall approve such measures provided that:

(A) The emission reductions from the recalled and repaired equipment or engines and the mitigation measures are equivalent to achieving the capture rate; and

(B) The emission reductions from the mitigation measures are real and verifiable; and

(C) The mitigation measures are implemented in a timely manner.

(c) Initiation and Notification of Ordered Emission-Related Recalls.

(1) A manufacturer shall be notified whenever the Executive Officer has determined, based on production-line test results or in-use test results, enforcement testing results, or any other information, that a substantial number of a class or category of equipment or engines produced by that manufacturer, although properly maintained and used, contain a failure in an emission-related component which, if uncorrected, may result in the equipments' or engines' failure to meet applicable standards over their useful lives; or whenever a class or category of equipment or engines within their useful lives, on average, do not conform to the emission standards prescribed pursuant to 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, as applicable to the model year of such equipment or engines.

(2) It shall be presumed for purposes of this section that an emission-related failure will result in the exceedance of emission standards unless the manufacturer presents evidence in accordance with the procedures set forth in subsections (A), (B), and (C) which

demonstrates to the satisfaction of the Executive Officer that the failure will not result in exceedance of emission standards within the useful life of the equipment or engine.

(A) In order to overcome the presumption of noncompliance set forth in paragraph (c)(2) above, the average emissions of the equipment and engines with the failed emission-related component must comply with applicable emission standards. A manufacturer may demonstrate compliance with the emission standards by following the procedures set forth in either paragraphs (c)(2)(B) or (c)(2)(C) of this section.

(B) A manufacturer may test properly maintained in-use equipment with the failed emission-related component pursuant to the applicable certification emission tests specified in Section 2433, Title 13 of the California Code of Regulations. The emissions shall be projected to the end of the equipment's or engine's useful life using in-use deterioration factors. The in-use deterioration factors shall be chosen by the manufacturer from among the following:

(i) "Assigned" in-use deterioration factors provided by the ARB on a manufacturer's conditions; request and based on ARB in-use testing; or,

(ii) deterioration factors generated during certification, provided adjustments are made to account for equipment aging, customer hour usage-accumulation practices, type of failed component, component failure mode, effect of the failure on other emission-control components, commercial fuel and lubricant quality, and any other factor which may affect the equipment's or engine's operating or,

(iii) subject to approval by the Executive Officer, a manufacturer-generated deterioration factor. Such deterioration factor must be based on in-use data generated from certification emission tests performed on properly maintained and used equipment in accordance with the procedures set forth in Section 2433 of Title 13 of the California Code of Regulations, and the equipment from which it was derived must be representative of the in-use fleet with regard to emissions performance and equipped with similar emission control technology as equipment with the failed component.

(C) In lieu of the equipment or engine emission testing described in subsection (B) above and subject to approval by the Executive Officer, a manufacturer may perform an engineering analysis, laboratory testing or bench testing, when appropriate, to demonstrate the effect of the failure.

(3) The notification shall include a description of each class or category of equipment or engines encompassed by the determination of nonconformity, shall set forth the factual basis for the determination and shall designate a date at least 45 business days from the date of receipt of such notification by which the manufacturer shall submit a plan to remedy the nonconformity.

(4) Availability of Public Hearing.

(A) The manufacturer may request a public hearing pursuant to the procedures set forth in Subchapter 1.25, Division 3, Chapter 1, Title 17, California Code of Regulations to contest the finding of nonconformity and the necessity for or the scope of any ordered corrective action.

(B) If a manufacturer requests a public hearing pursuant to subsection (A) above, and if the Executive Officer's determination of nonconformity is confirmed at the hearing, the manufacturer shall submit the recall plan required by Section 2439 within 30 days after receipt of the Board's decision.

(5) Ordered Recall Plan.

(A) Unless a public hearing is requested by the manufacturer, a recall plan shall be submitted to the Chief, Mobile Source Operations Division, 9528 Telstar Avenue, El Monte, CA 91731, within the time limit specified in the notification. The Executive Officer may grant the manufacturer an extension upon good cause shown.

(B) The recall plan shall contain the following:

(i) A description of each class or category of equipment or engine to be recalled, including the engine family or sub-group thereof, the model-year, the make, the model, and such other information as may be required to identify the equipment or engines to be recalled.

(ii) A description of the nonconformity and the specific modifications, alterations, repairs, corrections, adjustments or other changes to be made to bring the equipment or engines into conformity including a brief summary of the data and technical studies which support the manufacturer's decision regarding the specific corrections to be made.

(iii) A description of the method by which the manufacturer will determine the names and addresses of equipment or engine owners and the method by which they will be notified.

(iv) A description of the procedure to be followed by equipment or engine owners to obtain correction of the nonconformity including the date on or after which the owner can have the nonconformity remedied, the time reasonably necessary to perform the labor required to correct the nonconformity, and the designation of facilities at which the nonconformity can be remedied. The repair shall be completed within a reasonable time designated by the Executive Officer from the date the owner delivers the equipment or engine for repair. This requirement becomes applicable on the date designated by the manufacturer as the date on or after which the owner can have the nonconformity remedied.

(v) If some or all of the nonconforming equipment or engines are to be remedied by persons other than dealers or authorized warranty agents of the manufacturer, a description of such class of persons and a statement indicating that the participating members of the class will be properly equipped to perform such remedial action.

(vi) The capture rate required for each class or category of equipment or engine to be recalled. Under recalls based on exceedance of emission standards, the capture rate shall be at a minimum 80 percent of the equipment or engine within the subject engine family.

(vii) The plan may specify the maximum incentives (such as a free tune-up or specified quantity of free fuel), if any, the manufacturer will offer to induce equipment or engine owners to present their equipment for repair, as evidence that the manufacturer has made a good faith effort to repair the percentage of equipment or engines specified in the plan. The plan shall include a schedule for implementing actions to be taken including identified increments of progress towards implementation and deadlines for completing each such increment.

(viii) A copy of the letter of notification to be sent to equipment or engine owners.

(ix) A description of the system by which the manufacturer will assure that an adequate supply of parts will be available to perform the repair under the recall plan including the date by which an adequate supply of parts will be available to initiate the repair campaign, and the method to be used to assure the supply remains both adequate and responsive to owner demand.

(x) A copy of all necessary instructions to be sent to those persons who are to perform the repair under the recall plan.

(xi) A description of the impact of the proposed changes on fuel economy, operation, performance and safety of each class or category of equipment or engines to be recalled and a brief summary of the data, technical studies, or engineering evaluations which support these descriptions.

(xii) A description of the impact of the proposed changes on the average emissions of the equipment or engines to be recalled based on noncompliance described in subsection (c)(1), above. The description shall contain the following:

(1.) Average noncompliance emission levels.

(2.) Average emission reduction or increase per pollutant resulting from the recall repair. These averages shall be verified by the manufacturer by applying the proposed recall repairs to two or more in-use equipment or engines representing the average noncompliance emission levels. Only those equipment or engines with baseline emission levels within 25 percent of the average emission levels of noncomplying pollutant(s) established under the in-use enforcement test program may be used by manufacturers to verify proposed recall repairs. The Executive Officer may allow the use of equipment or engines exceeding these upper averaging noncompliance limits if none which meet the limits can be reasonably procured.

(3.) An estimate of the average emission level per pollutant for a class or category of

equipment or engines after repair as corrected by the required capture rate. The estimated average emission level shall comply with the applicable emission standards. If the average emissions levels achieved by applying the average emission reduction per equipment or engine after repair and the estimated capture rate, do not achieve compliance with the emissions standards, a manufacturer shall propose other measures to achieve average emissions compliance.

(xiii) Any other information, reports, or data which the Executive Officer may reasonably determine to be necessary to evaluate the recall plan.

#### (6) Approval and Implementation of Recall Plan.

(A) If the Executive Officer finds that the recall plan is designed effectively to correct the nonconformity and complies with the provisions of this Section, he or she will so notify the manufacturer in writing. Upon receipt of the approval notice from the Executive Officer, the manufacturer shall commence implementation of the approved plan. Notification of equipment or engine owners and the implementation of recall repairs shall commence within 45 days of the receipt of notice unless the manufacturer can show good cause for the Executive Officer to extend the deadline.

(B) If the Executive Officer does not approve the recall plan or the mitigation measures provided in this Section as submitted, the Executive Officer shall order modification of the plan or mitigation measures with such changes and additions as he or she determines to be necessary. The Executive Officer shall notify the manufacturer in writing of the disapproval and the reasons for the disapproval.

(C) The manufacturer may contest the Executive Officer's disapproval by requesting a public hearing pursuant to the procedures set forth in Subchapter 1.25, Division 3, Chapter 1, Title 17, California Code of Regulations. As a result of the hearing, the Board may affirm, overturn or modify the Executive Officer's action. In its decision, affirming or modifying, the Board shall specify the date by which the manufacturer shall commence notifying equipment or engine owners and implementing the required recall repairs.

(D) If no public hearing is requested in accordance with (C) above, the manufacturer shall incorporate the changes and additions required by the Executive Officer and shall commence notifying equipment or engine owners and implementing the required recall repairs within 60 days of the manufacturer's receipt of the Executive Officer's disapproval.

#### (7) Notification of Owners.

(A) Notification to equipment or engine owners shall be made by first class mail or by such other means as approved by the Executive Officer provided, that for good cause, the Executive Officer may require the use of certified mail to ensure an effective notification.

(B) The manufacturer shall use all reasonable means necessary to locate equipment or engine owners provided, that for good cause, the Executive Officer may require the manufacturer to use motor equipment registration lists, as applicable, available from State or commercial sources to obtain the names and addresses of equipment or engine owners to ensure effective notification.

(C) The Executive Officer may require subsequent notification by the manufacturer to equipment or engine owners by first class mail or other reasonable means provided, that for good cause, the Executive Officer may require the use of certified mail to ensure effective notification.

(D) The notification of equipment or engine owners shall contain the following:

(i) The statement: "The California Air Resources Board has determined that your (equipment or engine) (is or may be) releasing air pollutants which exceed (California or California and Federal) standards. These standards were established to protect your health and welfare from the dangers of air pollution."

(ii) A statement that the nonconformity of any such equipment or engines will be remedied at the expense of the manufacturer.

(iii) A statement that eligibility may not be denied solely on the basis that the equipment or engine owner used parts not manufactured by the original equipment manufacturer, or had repairs performed by outlets other than the equipment or engine manufacturer's franchised dealers.

(iv) A clear description of the components which will be affected by the recall action and a general statement of the measures to be taken to correct the nonconformity.

(v) [Reserved]

(vi) A description of the adverse effects, if any, that an uncorrected nonconformity would have on the performance, fuel economy, or driveability of the equipment or engine or to the function of other engine components.

(vii) A description of the procedure which the equipment or engine owner should follow to obtain correction of the nonconformity including the date on or after which the owner can have the nonconformity remedied, the time reasonably necessary to correct the nonconformity, and a designation of the facilities located in California at which the nonconformity can be remedied.

(viii) After the effective date of the recall enforcement program referred to above, a statement that a certificate showing that the equipment has been repaired under the recall program shall be issued by the service facilities and that such a certificate may be required as a condition of equipment registration or operation, as applicable.

(ix) A card to be used by a equipment or engine owner in the event the equipment or engine to be recalled has been sold. Such card should be addressed to the manufacturer, have postage paid, and shall provide a space in which the owner may indicate the name and address of the person to whom the equipment or engine was sold.

(x) The statement: "In order to ensure your full protection under the emission warranty made applicable to your (equipment or engine) by State or Federal law, and your right to participate in future recalls, it is recommended that you have your (equipment or engine) serviced as soon as possible. Failure to do so could be determined to be a lack of proper maintenance of your (equipment or engine)".

(xi) A telephone number provided by the manufacturer, which may be used to report difficulty in obtaining recall repairs.

(xii) The manufacturer shall not condition eligibility for repair on the proper maintenance or use of the equipment except for strong or compelling reasons and with approval of the Executive Officer; however, the manufacturer shall not be obligated to repair a component which has been removed or altered so that the recall action cannot be performed without additional cost.

(xiii) No notice sent pursuant to Section (D), nor any other communication sent to equipment or engine owners or dealers shall contain any statement, express or implied, that the nonconformity does not exist or will not degrade air quality.

(xiv) The manufacturer shall be informed of any other requirements pertaining to the notification under this section which the Executive Officer has determined are reasonable and necessary to ensure the effectiveness of the recall campaign.

#### (8) Repair Label.

(A) The manufacturer shall require those who perform the repair under the recall plan to affix a label to each equipment or engine repaired or, when required, inspected under the recall plan.

(B) The label shall be placed in a location as approved by the Executive Officer and shall be fabricated of a material suitable for such location and which is not readily removable.

(C) The label shall contain the recall campaign number and a code designating the facility at which the repair, inspection for repair, was performed.

(9) Proof of Correction Certificate. The manufacturer shall require those who perform the recall repair to provide the owner of each equipment or engine repaired with a certificate, through a protocol and in a format prescribed by the Executive Officer, which indicates that the noncomplying equipment or engine has been corrected under the recall program. This requirement shall become effective and applicable upon the effective date of the recall enforcement program referred to in this section, above.

(10) Capture Rates and Alternative Measures.

The manufacturer shall comply with the capture rate specified in the recall plan as determined pursuant to this Section, above, by the end of the fifth quarter, as defined in Section 2112(j), Chapter 2, Title 13 of the California Code of Regulations, following the quarter in which the notification of equipment or engine owners was initiated. If, after good faith efforts, the manufacturer cannot correct the percentage of equipment specified in the plan by the applicable deadlines and cannot take other measures to bring the engine family into compliance with the standards, the manufacturer shall propose mitigation measures to offset the emissions of the unrepaired equipment within 45 days from the last report filed pursuant to Section 2439(c)(13), below. The Executive Officer shall approve such measures provided that:

(A) The emission reductions from the recalled and repaired equipment or engines and the mitigation measures are equivalent to achieving the capture rate; and

(B) The emission reductions from the mitigation measures are real and verifiable; and

(C) The mitigation measures are implemented in a timely manner.

(11) Preliminary Tests. The Executive Officer may require the manufacturer to conduct tests on components and equipment or engines incorporating a proposed correction, repair, or modification reasonably designed and necessary to demonstrate the effectiveness of the correction, repair, or modification.

(12) Communication with Repair Personnel. The manufacturer shall provide to the Executive Officer a copy of all communications which relate to the recall plan directed to dealers and other persons who are to perform the repair. Such copies shall be mailed to the Executive Officer contemporaneously with their transmission to dealers and other persons who are to perform the repair under the recall plan.

(13) Recordkeeping and Reporting Requirements.

(A) The manufacturer shall maintain sufficient records to enable the Executive Officer to conduct an analysis of the adequacy of the recall campaign. For each class or category of equipment or engine, the records shall include, but need not be limited to, the following:

(i) Engine family involved and recall campaign number as designated by the manufacturer.

(ii) Date owner notification was begun, and date completed.

(iii) Number of equipment or engines involved in the recall campaign.

(iv) Number of equipment or engines known or estimated to be affected by the nonconformity.

(v) Number of equipment or engines inspected pursuant to the recall plan and found to be affected by the nonconformity.

(vi) Number of inspected equipment or engines.

(vii) Number of equipment or engines receiving repair under the recall plan.

(viii) Number of equipment or engines determined to be unavailable for inspection or repair under the recall plan due to exportation, theft, scrapping, or for other reasons (specify).

(ix) Number of equipment or engines determined to be ineligible for recall action due to removed or altered components.

(x) A listing of the identification numbers of equipment or engines subject to recall but for whose repair the manufacturer has not been invoiced. This listing shall be supplied in a standardized computer data storage device to be specified by the Executive Officer. The frequency of this submittal, as specified in subsection (C) below, may be changed by the Executive Officer depending on the needs of recall enforcement.

(xi) Any service bulletins transmitted to dealers which relate to the nonconformity and which have not previously been submitted.

(xii) All communications transmitted to equipment or engine owners which relate to the nonconformity and which have not previously been submitted.

(B) If the manufacturer determines that the original responses to subsections (A)(iii) and (iv) of these procedures are incorrect, revised figures and an explanatory note shall be submitted. Responses to subsections (A)(v), (vi), (vii), (viii), and (ix) shall be cumulative totals.

(C) Unless otherwise directed by the Executive Officer, the information specified in subsection (A) of these procedures shall be included in six quarterly reports or two annual reports, beginning with the quarter in which the notification of owners was initiated, or until all nonconforming equipment or engines involved in the campaign have been remedied, whichever occurs sooner. Such reports shall be submitted no later than 25 days after the close of each calendar quarter.

(D) The manufacturer shall maintain in a form suitable for inspection, such as computer information storage devices or card files, and shall make available to the Executive Officer or his or her authorized representative upon request, lists of the names and addresses of equipment or engine owners:

(i) To whom notification was given;

(ii) Who received remedial repair or inspection under the recall plan; and

(iii) Who were denied eligibility for repair due to removed or altered components.

(E) The records and reports required by these procedures shall be retained for not less than one year beyond the useful life of the equipment or engines involved, or one year beyond the reporting time frame specified in subsection (C) above, whichever is later.

(14) Penalties.

Failure by a manufacturer to carry out all recall actions ordered by the Executive Officer pursuant to Sections 2439(c) of these procedures is a violation of Health and Safety Code Section 43013 and 43105 and shall subject the manufacturer, on a per engine basis, to any and all remedies available under Part 5, Division 26 of the Health and Safety Code, sections 43000 et seq.

(d) Extension of Time. The Executive Officer may extend any deadline in the plan if he or she finds in writing that a manufacturer has shown good cause for such extension.

(e) The Executive Officer may waive any or all of the requirements of these procedures if he or she determines that the requirement constitutes an unwarranted burden on the manufacturer without a corresponding emission reduction.