

## UPDATED INFORMATIVE DIGEST

### AMENDMENTS TO CALIFORNIA'S SMALL OFF-ROAD ENGINE AND TIER 4 OFF-ROAD COMPRESSION-IGNITION ENGINE REGULATIONS AND TEST PROCEDURES; AND AMENDMENTS TO THE EXHAUST EMISSION CERTIFICATION TEST FUEL FOR OFF-ROAD SPARK-IGNITION ENGINES, EQUIPMENT, AND VEHICLES

#### **Sections Affected:**

Small Off-Road Engines (SORE) sections 2403 and 2407; and to the following document as incorporated by reference therein: "California Exhaust Emission Standards and Test Procedures for 2005 and Later Small Off-Road Engines," as adopted July 26, 2004, and as last amended February 24, 2010; and the following documents incorporated by reference therein: "California Exhaust Emission Standards and Test Procedures for New 2013 and Later Small Off-Road Engines; Engine-Testing Procedures (Part 1054)"; and "California Exhaust Emission Standards and Test Procedures for New 2013 and Later Small Off-Road Engines; Engine-Testing Procedures (Part 1065)"; and

Off-Road Compression-Ignition (ORCI) Engines sections 2421, 2423, 2424, 2425, 2425.1, 2426, and 2427; and to the following document as incorporated by reference therein: "California Exhaust Emission Standards and Test Procedures for New 2008 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-C," adopted October 20, 2005; and to the following documents incorporated by reference therein: "California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-D," adopted October 20, 2005; and "California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-F," adopted October 20, 2005; and adoption of the following document incorporated by reference therein: "California Exhaust Emission Standards and Test Procedures for New 2011 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-E"; and

Off-Road Large Spark-Ignition (LSI) Engines sections 2433, 2783, and 2784; and to the following documents incorporated by reference therein: "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)," as adopted March 2, 2007, and as last amended November 21, 2008; and "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)," as adopted March 2, 2007; and

Off-Highway Recreational Vehicles (OHRV) section 2412; and to the following document incorporated by reference therein: "California Exhaust Emission Standards and Test Procedures for 1997 and Later Off-Highway Recreational Vehicles and Engines," as adopted May 26, 1995, and as last amended June 1, 2007; and

Spark-Ignition Marine Engines (SIME) section 2447; and to the following document incorporated by reference therein: "California Exhaust Emission Standards and Test Procedures for 2001 Model Year and Later Spark-Ignition Marine Engines," as adopted October 21, 1999, and as last amended June 5, 2009.

### **Background:**

Health and Safety Code (HSC) sections 39600 (General Powers), 39601 (Standards, Definitions, Rules and Measures), and 39602.5 (Adoption of Rules and Regulations) direct the Air Resource Board (ARB or Board) to adopt rules and measures necessary to execute the Board's powers and duties imposed by State law and to attain federal national ambient air quality standards in all areas by applicable attainment dates. HSC sections 43013 and 43018(a) provide broad authority to achieve the maximum feasible and cost-effective emission reductions from all mobile source categories, including both new and in-use on-road and off-road engines used in motor vehicles.

California's Air Toxics Program, established under California law by Assembly Bill (AB) 1807 (stats. 1983, ch. 1047, the Tanner Act) and set forth in HSC sections 39650 through 39675, also mandates that ARB identify and control air toxic emissions in California. Following the identification of a substance as a toxic air contaminant, HSC section 39665 requires ARB, with the participation of the local air pollution control and air quality management districts (Districts), and in consultation with affected sources and interested parties, to prepare a report on the need and appropriate degree of regulation for that substance. Based upon the findings of the report, ARB is vested with authority under sections 39666 and 39667 to adopt and enforce airborne toxic control measures that will respectively achieve emission reductions using best available control technology for nonvehicular and vehicular sources.

#### *Small Off-Road Engines*

In 1990, ARB approved the initial exhaust emission control regulations for new SORE. These regulations included exhaust emission standards, emission test procedures, and provisions for warranty and production compliance programs, which are contained in title 13, California Code of Regulations (CCR), sections 2400-2409, along with the applicable test procedures which are incorporated by reference. Later, the U.S. Environmental Protection Agency (U.S. EPA) adopted similar but less stringent regulations and test procedures for small "nonroad" spark-ignition engines, which were introduced in title 40, Code of Federal Regulations (CFR), Part 90 (40 CFR Part 90).

In 2003, ARB adopted more stringent SORE exhaust emission standards, and also aligned, with some modifications (ARB 2003), with U.S. EPA's small nonroad engine test procedures in 40 CFR Part 90.

In November 2008, ARB adopted modifications to the emission credit program for SORE, including adding a zero-emission equipment credit program and an option to certify using a 10-percent ethanol-blend (E10) of gasoline, as well as other minor modifications to the regulations (ARB 2008).

### *Off-Road Compression-Ignition Engines*

In 1990, the Board adopted the very first emission standards for new ORCI engines for engines less than 19 kilowatts (kW) as part of the California requirements for 1995 and later small off-road engines. In 1992, the Board approved standards for ORCI engines 130 kW and greater, which became known as the tier 1 standards. These standards were implemented beginning in 1996 and resulted in approximately a 50-percent drop in oxides of nitrogen (NOx) emissions compared to previously uncontrolled engines.

Also in 1992, the Board adopted a second tier of more stringent emission standards, known as tier 2. These original tier 2 standards were to apply to engines with rated power  $130 \leq \text{kW} \leq 560$  beginning in 2000. However, in response to U.S. EPA's 1998 adoption of even more stringent tier 2 emission standards to start in 2001, ARB fully aligned California's standards and implementation schedules with U.S. EPA's requirements in 2000 (ARB 1999). Tier 2 requirements were phased-in from 2001 through 2010, and encompassed the entire power spectrum of engine applications including those above 560 kW and those under 19 kW.

ARB also adopted U.S. EPA's tier 3 standards, which were phased-in from 2006 through 2011 and were applicable to engines with rated power  $37 \leq \text{kW} \leq 560$ . The new standards have reduced non-methane hydrocarbons plus NOx (NMHC + NOx) emissions by an additional 40 percent compared to the previous tier 2 standards. However, tier 3 particulate matter (PM) standards are the same as tier 2 PM standards.

In 2004, ARB adopted interim and final tier 4 emission standards. Tier 4 interim standards began in 2008 for some engines and required maximum control of PM and NMHC emissions, but only moderate control of NOx emissions, primarily to allow for the maturation of advanced aftertreatment NOx control technologies. Tier 4 final standards typically begin 3 or 4 years after the start of the interim standards for each power category and generally require engines to meet significantly more stringent advanced aftertreatment-based PM and NOx standards.

### *U.S. Environmental Protection Agency Nonroad Regulations and Test Procedures California's Off-Road Exhaust Emission Certification Test Fuel*

In 2007, ARB amended the Phase 3 reformulated gasoline (CaRFG3) regulations by essentially increasing the amount of fuel oxygenates (i.e., ethanol) in California's commercially available gasoline from 5.7 percent (i.e., E6) to 10 percent (i.e., E10) by December 31, 2009. Staff recognized that there was limited ethanol-based emission test data available from off-road, spark-ignition engines during this rulemaking.

On January, 27, 2012, ARB adopted an E10 gasoline certification test fuel specification for on-road motor vehicles. Accordingly, the Board adopted the same fuel for use in California's off-road spark-ignition engine categories to re-establish the consistency that had existed originally between the off-road categories' certification and commercially available fuels.

### **Description of Regulatory Action:**

On December 16, 2011, the Board conducted a public hearing to consider staff's proposal as described in the Staff Report. At the hearing's conclusion, the Board voted to amend California's off-road exhaust emission regulations for new SORE and tier 4 ORCI engines. The amendments, overall, provide better harmonization with federal certification and exhaust emission testing requirements for SORE and tier 4 ORCI engine regulations and associated test procedures. The amendments create a more efficient certification process for engine and equipment manufacturers by removing the burden to perform duplicative testing for California and federal certification. The amendments to the tier 4 ORCI engine regulations also provide for more descriptive labeling requirements, which will facilitate the implementation and enforcement of ARB's various in use programs in California.

Furthermore, the Board approved modifications to the exhaust-emission certification test fuel requirements used in the gasoline-fueled SORE, LSI engines, OHRV, and SIME off-road categories. These amended requirements require a ten-percent ethanol-blend of gasoline, which would be the same as the on-road motor vehicle test fuel requirement that was approved by the Board on January 27, 2012, or other fuel blends approved by ARB as appropriate for use in off-road categories.

Staff also proposed various editorial corrections and several modifications to the proposed regulatory action. Written and oral comments were received at the hearing concerning staff's proposal. A Notice of Public Availability of Modified Text containing the Board directed amendments to the regulation was released for a 15-day comment period on March 22, 2012, the results of which have been incorporated as attachments to the Final Statement of Reasons for this rulemaking.

A full description of the amendments can be found in the "Staff Report: Initial Statement of Reasons," with the other regulatory documents for this rulemaking, at <http://www.arb.ca.gov/regact/2011/soreci2011/soreci2011.htm>.

The Board also adopted other non-substantive modifications to the affected regulations and test procedures to clarify or simplify existing language.

## **COMPARABLE FEDERAL REGULATIONS**

In 2001, U.S. EPA adopted title 40, CFR, Part 1065, as a “united” test procedure for both “nonroad” engines and equipment and on-highway heavy-duty CI engines. The test procedures in Part 1065 essentially replaced those previously used in Part 90 for nonroad spark-ignition engines and those in Part 89 for nonroad CI engines. Part 1065 is currently the technical part of U.S. EPA’s regulations that promulgates emissions measurement methodologies, criteria for selecting analytical instrumentation, calibration procedures, and specifications for virtually all engine categories. Since its initial adoption, Part 1065 has been amended repeatedly to both improve and expand its applicability for the nonroad engine categories. In addition, U.S. EPA adopted specific “standard-setting” parts for each engine/equipment and vehicle category. Besides the actual emission standards, these standard-setting parts contain other provisions, such as certification protocols, production-line testing requirements, credit-generation allowances, etc. Also adopted was Part 1068, which is the general compliance, special provisions, and defect reporting part of U.S. EPA’s regulations.

Since 2005, U.S. EPA has adopted several amendments to its nonroad CI engine regulations contained in Parts 1039, 1065, and 1068. Federal nonroad CI engines certified to the more stringent “tier 4” emission standards must be tested using Part 1065. Use of Part 1065 is optional for less stringent “tier 3” and earlier model engines. Part 1039 is the standard-setting part of U.S. EPA’s regulations for nonroad CI engines, and also contains provisions regarding certification procedures, labeling, credit generation, emissions averaging, equipment flexibility options, and hardship relief.

In 2008, U.S. EPA adopted exhaust and evaporative emission standards for small nonroad engines, which coincided with some of ARB’s SORE emission standards that were adopted in 2003. At the same time, U.S. EPA divided up the small nonroad engine requirements that were contained in the then-current Part 90, and distributed these requirements into other parts. The applicable small nonroad engine test procedures are now contained in Part 1065; the standard-setting provisions for small nonroad engines are now contained in Part 1054; and, the small nonroad engine general compliance requirements are now contained in Part 1068. Also at that time, U.S. EPA set the requirement that nonroad small engines had to be tested using the Part 1065 test procedures starting with the 2013 model year, although carry-over of engines already certified using the older Part 90 test procedures would still be allowed.

## **BENEFITS OF THE PROPOSAL**

These modifications and additions to the regulations and test procedures preserve the stringency of the existing emission standards and effectiveness of the associated test procedures while creating greater harmonization with similar requirements already promulgated by U.S. EPA. The harmonization of requirements where possible facilitates certification and allows manufacturers to better utilize resources. The adopted amendments do not require manufacturers to generate additional emission benefits, nor do they permit a decrease overall from existing benefits. Based on ARB’s

review of the proposed regulatory action, staff has concluded that the amendments to SORE, tier 4 off-road CI engine, and off-road spark-ignition engine regulations and test procedures (including the certification test fuel changes), would not have a significant adverse effect on the environment. No discussion of alternatives or mitigation measures is necessary because there are no significant adverse environmental impacts identified.