

Final Regulation Order

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Amend Article 4.5, Chapter 9, Division 3, Title 13, California Code of Regulations, to read as follows:

Chapter 9. Off-Road Vehicles and Engines Pollution Control Devices Article 4.5. Off-Road Large Spark-Ignition Engines

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

(a) [No Change]

(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]⁽¹⁾

| <i>Model Year</i> | <i>Engine Displacement</i> | <i>Durability Period</i> | <i>Hydrocarbon plus Oxides of Nitrogen HC + NO_x</i> | <i>Carbon Monoxide</i> |
|--|----------------------------|-------------------------------|--|------------------------------|
| 2002 and subsequent- 2010 | ≤ 1.0 liter | 1,000 hours or 2 years | 9.0 [12.0] | 410 [549] |
| 2011 and subsequent | ≤ 825 cc | <u>1,000 hours or 2 years</u> | <u>6.0</u> <u>[8.0]</u> | <u>410</u> <u>[549]</u> |
| 2011 - 2014 | > 825 cc - ≤ 1.0 liter | <u>1,000 hours or 2 years</u> | <u>4.8</u> <u>[6.5]</u> | <u>280</u> <u>[375]</u> |
| 2015 and subsequent | > 825 cc - ≤ 1.0 liter | <u>1,000 hours or 2 years</u> | <u>0.6</u> <u>[0.8]</u> | <u>15.4</u> <u>[20.6]</u> |
| 2001 - 2003 ^{(2),(3)} | > 1.0 liter | N/A | 3.0 [4.0] | 37.0 [49.6] |
| 2004 - 2006 ⁽⁴⁾ | > 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 ^{(5),(6)} | > 1.0 liter | 5000 hours or 7 years | 0.6 [0.8] | 15.4 [20.6] |

- Note: (1) 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.
- (2) Small volume manufacturers are not required to comply with these emission standards.
- (3) 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.
- (4) 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.
- (5) For severe-duty engines, the HC+NOx standard is 2.7 g/kW-hr and the CO standard is 130.0 g/kW-hr.
- (6) Small volume manufacturers are required to comply with these emission standards in 2013.

(B) [No Change]

(C) [No Change]

(2) (A) *Optional Exhaust Emission Standards.* Manufacturers may certify ~~off-road large spark-ignition~~ 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]⁽¹⁾

| <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: (1) 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 off road large spark-ignition LSI engines shall be 140 percent of the corresponding OLESoptional HC+NOx standard and 150 percent of the corresponding OLESoptional 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.(A) 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.(B) For nonmetallic fuel lines, you must specify and use products that meet the Category 1 specifications in SAE J2260 (issued November 1996).

3.(C) 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.(D) 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 off-road-LSI engines with an engine displacement equal to or 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) [No Change]

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code. Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150, 43151, 43152, 43153, 43154, 43205.5, 43210, 43210.5, 43211 and 43212, Health and Safety Code.

