UPDATED INFORMATIVE DIGEST

Amendments to the Off-Road Compression-Ignition Engine Regulations

Sections Affected: This action amends the following chapter and sections of Title 13, California Code of Regulations (CCR), and the documents incorporated by reference therein: sections 2111, 2112, and Appendix A to Article 2.1; sections 2137, 2139, 2140, 2141, 2400, 2401, 2403, 2420, 2421, 2423, 2424, 2425, 2426, and 2427; and "California Exhaust Emission Standards and Test Procedures for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines," and "California Smoke Test Procedures for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines," which are incorporated by reference in section 2421, and the document "California Exhaust Emission Standards and Test Procedures for 1995 and Later Small Off-Road Engines," which is incorporated by reference in section 2403. This action also adopts the new document “California Exhaust Emission Standards and Test Procedures for New 2000 and Later Off-Road Compression-Ignition Engines,” which is incorporated by reference in section 2421.

Background: The California Clean Air Act as codified in the Health and Safety Code sections 43013 and 43018 grants the ARB authority to regulate off-road mobile source categories. Included are marine vessels, locomotives, utility engines, off-road motorcycles, and off-highway vehicles.

In 1992, the ARB approved regulations to control exhaust emissions from heavy-duty off-road compression-ignition (CI) engines 175 horsepower (130 kilowatts) and above. In 1994, the Air Resources Board approved a State Implementation Plan (SIP) for ozone. The SIP contained measures M-9 and M-10, which called for new state and national emission standards, respectively, for off-road CI engines beginning in 2005. In August 1996, the ARB, the United States Environmental Protection Agency (U.S. EPA), and the manufacturers of off-road CI engines signed a statement of principles (SOP) calling for the harmonization of ARB and U.S. EPA off-road CI engine regulations. The SOP was a cooperative agreement between ARB, U.S. EPA, and the engine manufacturers that recognized the technological feasibility of significant emission reductions from those engines, and may be downloaded from the Internet at:

www.arb.ca.gov/msprog/macmail/msc9802/att_g.wpd

The U.S. EPA promulgated new emission standards, along with changes to the existing federal averaging, banking, and trading program, and changes to useful life and maintenance requirements for nonroad CI engines (63 Fed. Reg. 56,968 (Oct. 23, 1998)). The proposed amendments to existing California emission

standards and test procedures are designed to harmonize as closely as possible with the federal program, while still maintaining the emission reduction benefits of the current California program. The coordinated efforts of ARB, U.S. EPA, and the engine manufacturers to introduce lower-emission off-road CI engines nationwide will result in substantial air quality benefits in California and the rest of the country.

The Amendments: On January 28, 2000, the Board considered and adopted without modification the amendments that staff proposed. The heart of the amendments is a set of emission standards for new off-road CI engines, with implementation commencing in 2000. The standards limit emissions of oxides of nitrogen (NOx) and non-methane hydrocarbons (NMHC). Rather than a single standard for all engine sizes, the amendments consist of different standards partitioned by the power produced by the engine. All standards are identical to those adopted by the U.S. EPA, which appear at 40 C.F.R. Part 89; the standards are shown in Table 1.

Table 1
Proposed California emissions standards
(grams per kilowatt-hour)

Maximum Rated Horsepower (hp)	Tier	Model Year	NOx	Hydrocarbons	NMHC+ NOx	Carbon Monoxide	Particulate Matter
kW<8[a]	Tier 1	2000-2004	—	—	10.5	8.0	1.0
	Tier 2	2005 and later	—	—	7.5	8.0	0.80
8≤kW<19[a]	Tier 1	2000-2004	—	—	9.5	6.6	0.80
	Tier 2	2005 and later	—	—	7.5	6.6	0.80
19≤kW<37	Tier 1	2000-2003	—	—	9.5	5.5	0.80
	Tier 2	2004 and later	—	—	7.5	5.5	0.60
37≤kW<75	Tier 1	2000-2003	9.2	—	—	—	—
	Tier 2	2004-2007	—	—	7.5	5.0	0.40
	Tier 3	2008 and later	—	—	4.7	5.0	—
75≤kW<130	Tier 1	2000-2002	9.2	—	—	—	—
	Tier 2	2003-2006	—	—	6.6	5.0	0.30
	Tier 3	2007 and later	—	—	4.0	5.0	—

Table 1, continued
Proposed California emissions standards
(grams per kilowatt-hour)

Maximum Rated Horsepower (hp)	Tier	Model Year	NOx	Hydrocarbons	NMHC+ NOx	Carbon Monoxide	Particulate Matter
130≤kW<225	Tier 1[b]	2000-2002	9.2	1.3	—	11.4	0.54
	Tier 2[c]	2003-2005	—	—	6.6	3.5	0.20
	Tier 3	2006 and later	—	—	4.0	3.5	—
225≤kW<450	Tier 1[b]	2000	9.2	1.3	—	11.4	0.54
	Tier 2[c]	2001-2005	—	—	6.4	3.5	0.20
	Tier 3	2006 and later	—	—	4.0	3.5	—
450≤kW≤560	Tier 1[b]	2000-2001	9.2	1.3	—	11.4	0.54
	Tier 2[c]	2002-2005	—	—	6.4	3.5	0.20
	Tier 3	2006 and later	—	—	4.0	3.5	—
kW>560	Tier 1[b,c]	2000-2005	9.2	1.3	—	11.4	0.54
	Tier 2	2006 and later	—	—	6.4	3.5	0.20

Notes:

a. The Tier 1 and Tier 2 emission standards for less than 25 horsepower (19 kilowatt) compression-ignition engines were already adopted as part of the 1998 small off-road engine rulemaking.
b. Tier 1 emission standards were already adopted as part of the 1992 heavy-duty off-road diesel cycle engine rulemaking.
c. This regulation will modify existing emission standards.

In addition to the emissions standards, these amendments mirror the federal requirements for durability, maintenance intervals, recordkeeping, warranties, test procedures, certification test fuel, and engine useful life. The amendments also include provisions for implementation flexibility for post-manufacture marinizers (i.e., those who produce marine engines by modifying engines purchased from other engine manufacturers) and optional reduced-emission standards and labeling requirements for CI engines ("Blue Sky Series"). As a package, these requirements would protect the air quality benefits of the proposed standards and help ensure that the engines remain cleaner longer.

The amendments were designed to harmonize as closely as possible with the federal program, while still maintaining the emission reduction benefits of the California program. Some of the more significant features of the amendments are noted below.

1. The amendments remove the existing California quality-audit testing requirement and the California new engine compliance testing program. In their place, the amendments provide for a California-administered version of the federal Selective Enforcement Audit program. Additionally, off-road CI engines would be incorporated into California's existing in-use compliance program, with the federal recall testing periods and useful life definitions. The in-use compliance program is described in title 13, California Code of Regulations and the documents incorporated by reference therein: sections 2100-2149.

2. The amendments provide compliance flexibility to equipment manufacturers by allowing the continued use of engines meeting the current standards for up to seven years. The amendments also provide additional flexibilities for small-volume equipment manufacturers.

3. The amendments move model year 2000 and later off-road CI engines below 25 horsepower (19 kilowatts) from regulation under sections 2400-2409 as part of the small off-road engine category and include them with other off-road CI engines in sections 2420-2427. This consolidation helps to harmonize with the federal program.

As noted above, SIP measure M9 calls for new emission standards beginning in 2005. These amendments do not reach the 2.5 g/bhp-hr (3.4 g/kW-hr) NOx level called for in the SIP, but with the earlier start-date and allowing for greater fleet turnover by the SIP deadlines, comparable emission benefits are achieved. Using the same assumptions used for calculating the emissions impact of the SIP, the 1994 SIP commitment to achieve 86 tons per day of ROG and NOx reductions from off-road compression-ignition engines in the South Coast Air Basin will occur. Additionally, the earlier start-date and greater fleet turnover will provide emission benefits in SIP areas with 2005 attainment dates (Sacramento and Ventura Air Basins). These amendments will also provide emission reductions in the San Joaquin Valley Air Basin in 2005 (the San Joaquin Valley will not meet their attainment date of 1999 and must submit a new plan demonstrating attainment by 2005).

Incorporation of Test Procedures and Federal Regulations.

The amended “test procedure” documents initially incorporated by reference in section 2423(c) are now incorporated by reference in section 2421. The newly adopted test procedure document is also incorporated by reference in section 2421. The amended and adopted documents are now as follows:

"California Exhaust Emission Standards and Test Procedures for New 1996 - 1999 Heavy-Duty Off-Road Compression-Ignition Engines, Part I-A", Adopted: May 12, 1993, Amended: [date of amendment];

"California Exhaust Emission Standards and Test Procedures for New 1996 and Later Off-Road Compression-Ignition Engines, Part II," Adopted: May 12, 1993, Amended: [date of amendment];

"California Smoke Test Procedures for New 1996 - 1999 Off-Road Compression-Ignition Engines, Part III," Adopted: May 12, 1993, Amended: [date of amendment]"; and the new

"California Exhaust Emission Standards and Test Procedures for New 2000 and Later Off-Road Compression-Ignition Engines, Part I-B," Adopted: [date of adoption].

In addition, the following documents are also incorporated by reference:

"California Exhaust Emission Standards and Test Procedures for 1995 and Later Small Off-Road Engines," Adopted: March 20, 1992, and last amended [date of amendment];

40 CFR Part 85, Subpart T (July 1, 1999);

40 CFR Part 86, Subparts A, D, I, and N (July 1, 1999); and

40 CFR Part 89 (July 1, 1999), as modified in the test procedure documents.

Economic and Fiscal Impact.

The Board approved ARB staff's evaluation of the potential economic impacts on private persons and businesses. Since these amendments serve to harmonize with the requirements already in place with the federal rule, industry will not incur significant costs in demonstrating compliance for California. Furthermore, this harmonization ensures that the ultimate purchasers in California should be spared from uniquely higher prices for off-road compression-ignition engines and equipment.

Although there may be a small increase in ARB enforcement/certification resources to ensure the standards are being met over the useful life of these off-road compression-ignition engines, the Board has determined that this regulatory action will not result in a mandate to any local agency or school district, the costs of which would have been reimbursable pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code.

Consideration of Alternatives.

One alternative to the amendments would have been to continue with the off-road compression-ignition engine emission standards that the Board adopted in 1992. However, with the passage of U.S. EPA's nonroad compression-ignition rule in 1998, the California regulations had become comparatively less stringent. Pursuant to the federal Clean Air Act (CAA), in order for California to enforce its own emissions reduction program the Board must adopt regulations that are, in the aggregate, at least as protective of public health and welfare as applicable federal standards (CAA Section 209(e)(2)(A)). Moreover, ARB committed to harmonize with U.S. EPA's emissions standards and other provisions, provided that such action would not compromise California's obligations to comply with state and federal law, including the SIP. Therefore, staff rejected this alternative.

In the early stages of developing the amendments, staff was asked to consider repealing California's regulatory program in its entirety, allowing all control of these sources to rest with U.S. EPA. Although this would result in the least possible burden for engine manufacturers, the staff had serious reservations about abdicating its authority to independently enforce the regulations. There is also the possibility for modifications to the federal program that could place California in jeopardy of not complying with the national ambient air quality standards. Repeal would place the implementation of measures M9 and M10 fully with U.S. EPA, wherein ARB would be just one of many interested parties involved in establishing the effectiveness and timing of the federal regulations. Furthermore, this alternative would hinder California's ability to pursue further control of these sources. Since California has long been recognized by the federal government as having special air quality problems, and needing special authority to address those problems, this alternative was rejected.

Comparison to Federal Regulations.

On October 23, 1998, the U.S. EPA adopted regulations for nonroad compression-ignition engines. These regulations are essentially equivalent to California's regulations.