



Air Resources Board



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December 21, 2010

MANUFACTURERS ADVISORY CORRESPONDENCE 2010-002

TO: ALL OFF-ROAD COMPRESSION-IGNITION ENGINE
MANUFACTURERS
ALL OFF-ROAD COMPRESSION-IGNITION ENGINE VEHICLE
MANUFACTURERS
ALL OTHER INTERESTED PARTIES

SUBJECT: CLARIFICATION OF ALTERNATE NOX FAMILY EMISSION LEVEL FOR
2011-2014 MODEL YEAR NONROAD COMPRESSION IGNITION
ENGINES IN THE $130 \leq \text{kW} \leq 560$ POWER CATEGORY

Several nonroad compression-ignition engine manufacturers have requested that ARB clarify whether it will allow them to certify certain engines to the 3.8 g/kW-hr alternate oxides of nitrogen (NOx) family emission level (FEL) from the 2011 through the 2014 model years, consistent with the provisions of 40 Code of Federal Regulations section 1039.104, as amended on September 7, 2007. This letter provides a MAC that clarifies that ARB will allow engine manufacturers to certify nonroad compression ignition engines in the $130 \leq \text{kW} \leq 560$ power category to a 3.8 g/kW-hr alternate NOx FEL cap from the 2011 through the 2014 model years, consistent with the provisions of title 40, CFR section 1039.104, as effective September 7, 2007.

If you have questions or issues regarding this MAC, please contact Ms. Jackie Lourenco, Chief, New Vehicle/Engine Programs Branch, at (626) 450-6152 or jlourenc@arb.ca.gov.

Sincerely,

/s/

Annette Hebert, Chief
Mobile Source Operations Division

Enclosure

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

State of California
AIR RESOURCES BOARD

MANUFACTURERS ADVISORY CORRESPONDENCE 2010-002

SUBJECT: Clarification of Alternate NO_x Family Emission Level For 2011-2014 Model Year Nonroad Compression Ignition Engines In The 130 ≤ kW ≤ 560 Power Category

APPLICABILITY: New 2011-2014 Model Year Off-Road Compression-Ignition Engines in the 130 ≤ kW ≤ 560 power category.

REFERENCES: Title 13, California Code of Regulations, section 2423(b)(2)(B)
Title 40, Code of Federal Regulations section 1039.104
72 Federal Register 53118 (September 7, 2007)

BACKGROUND AND DISCUSSION:

On June 29, 2004, U.S. EPA published a final rule promulgating new, more stringent emission standards, test procedures, and related certification requirements for off-road diesel engines and equipment (Tier 4 standards). 69 Federal Register 38958 (June 29, 2004). The Tier 4 standards were based on the use of advanced exhaust emission control devices, and will result in substantial benefits to public health and welfare through significant reductions in emissions of oxides of nitrogen and particulate matter, as well as nonmethane hydrocarbons, carbon monoxide, and air toxics. The ARB adopted the identical emission standards for California on October 21, 2005, which took effect on January 6, 2006.

The Tier 4 regulation provides engine manufacturers several compliance options including the ability to certify engines under an averaging, banking, and trading (AB&T) program, and to phase-in compliance by certifying engines to an alternate NO_x standard during an interim period before the full commencement of final Tier 4 standards. Under the AB&T program, engine families may be certified by averaging emission levels across engine families (known as Family Emission Levels or FELs) and/or by using emission credits generated from engines previously certified to emissions levels that are lower than applicable certification standards. FELs are subject to caps in order to limit the propagation of excessively higher emitting engines.

EPA has previously set the FEL cap for a new standard to be equivalent to the standards established in the previous Tier level, to allow manufacturers to devote their efforts to meeting the new standards instead of redesigning existing engines to qualify under the AB&T provisions. However, because the Tier 4 standards represent significant emission reductions versus Tier 3 standards, U.S. EPA specified an FEL cap closer to the actual alternate NO_x standard. However, U.S. EPA did provide that a

limited number of Tier 3 engines could still be averaged in meeting the Tier 4 alternate NOx standard and assigned alternate FEL caps that reflected values consistent with the Tier 3 standards. The number of engines that could be certified using these alternate FEL caps was not to exceed 20 percent during any single model year, by power category, of the interim period or a maximum of 40 percent over the four year interim period.

Discrepancy In Initial Federal Regulation and Resolution of Discrepancy by EPA

The initial federal Tier 4 regulation contained an inconsistency in the provisions of Title 40, Code of Federal Regulations (CFR) Section 1039.104. Specifically, 40 CFR section 1039.104(g)(1) expressly stated that the period of applicability for certifying engines to the alternate NOx FEL caps specified in Table 1 of that section extends over a four year period, but Table 1 stated that for off-road engines in the $130 \leq \text{kW} \leq 560$ power category, the period of applicability was only available for the 2014 model year. This exclusion of the 2011 through the 2013 model year engines in Table 1 was an oversight, otherwise Table 1 would have effectively negated the allowance of any Tier 3 engines to be averaged in compliance with the alternate NOx standard for this power category during the initial Tier 4 years. This is because Table 1 of section 1039.104 would have established a maximum alternate NOx FEL cap of 2.7 g/kW-hr for affected engines certified to the alternate NOx standard (2.0 g/kW-hr) at the onset of Tier 4 implementation in 2011, then permitted a less stringent alternate NOx FEL cap of 3.8 g/kW-hr for engines certified to the alternate NOx standard in 2014, then once again required a NOx FEL cap of 2.7 g/kW-hr for 2015 and subsequent model year engines, which is inconsistent with the intent of section 1039.104 to ease the transition to the final Tier 4 standards.

On September 7, 2007, U.S. EPA resolved this inconsistency via a direct final rulemaking, by amending Table 1 of section 1039.104 to clarify that off-road engines in the $130 \leq \text{kW} \leq 560$ power category can certify a limited number of engines to a 3.8 g/kW-hr alternate NOx FEL cap from the 2011 through the 2014 model years. 72 Federal Register 53118 (September 7, 2007). U.S. EPA explained this correction “corrects an inconsistency with the existing regulatory text that effectively prevents the use of credit-using Tier 3 engines in the initial years of Tier 4 in certain situations.” 72 Fed.Reg. 53118, 53122.

POLICY

Several off-road diesel engine manufacturers have requested that ARB clarify whether it will allow them to certify engines in the $130 \leq \text{kW} \leq 560$ power category to the 3.8 g/kW-hr alternate NOx FEL cap from the 2011 through the 2014 model years.

The rulemaking record for ARB’s adoption of California’s Tier 4 emission standards for off-road diesel engines and equipment reflects the Board’s intent to align California’s AB&T provisions with the federal provisions. Section 4.6 of the Staff Report for that

rulemaking, published on October 26, 2004, states that ARB does not intend to have separate AB&T requirements or implementation dates from those established by U.S. EPA. “[T]he proposed AB&T program for use in California would be identical in nature to the federal AB&T program,” and “the California program does not restrict the generation and use of AB&T credits within State borders, nor does it use a separate calculation for determining credits, but rather allows California credits to be accounted for under the federal program and used accordingly.” Section 4.6.2 of the Staff Report states “[t]he FEL cap for such engines [those for which the alternate NO_x provisions would apply] would be set based on the level of the standards that applied in the year prior to the new standards ...” and “[t]he allowance to certify up to these higher FEL caps will apply to Tier 4 engines ... beginning as early as the 2011 model year.”

In Resolution 04-43, the Board found that “[a]llowing engine manufacturers to participate in the federal Tier 4 Averaging, Banking, and Trading (ABT) program will provide industry with greater flexibility in complying with the emission standards while achieving the overall emission reduction goals of the proposed amended regulations”, and also found that “[a]doption of Tier 4 implementation flexibilities, in accordance with the allocations provided under the federal program, will provide equipment manufacturers additional flexibility in the transition to more stringent emission standards and newer technologies.”

Because the Board intended to align the California and federal AB&T provisions, and because staff believes U.S. EPA’s September 7, 2007 amendment restores the federal Tier 4 regulation to its original intent by clarifying an obvious technical error in the original federal text, staff intends to amend Table 2b of title 13, California Code of Regulations section 2423(b)(2)(B) to clarify that off-road engines in the $130 \leq \text{kW} \leq 560$ power category can certify the limited number of engines to a 3.8 g/kW-hr alternate NO_x FEL cap from the 2011 through the 2014 model years.

Staff intends to present this amendment to the Board in a future rulemaking action, but in the interim, ARB will allow off-road engine manufacturers to certify off-road engines in the $130 \leq \text{kW} \leq 560$ power category to a 3.8 g/kW-hr alternate NO_x FEL cap from the 2011 through the 2014 model years, consistent with the provisions of title 40, CFR section 1039.104, as effective September 18, 2007.

In addition to the basic information submitted to Document Management System (DMS) for off-road diesel engine certification, staff will need additional information from engine manufacturers to review and process engine families to be certified using the alternate NO_x FEL cap of 3.8 g/kW-hr. Attached is a table manufacturers shall fill out and submit to DMS to show its projected NO_x AB&T plan. The plan shall include engine family names, projected sales, FELs and emission standards, and designate phase-in, phase-out, alternate NO_x, and alternate NO_x FEL cap engines. Manufacturers shall show that the number of engines certified to the alternate NO_x FEL cap does not exceed 20 percent of their U.S. directed production volume of engines in any single model year in each power category. In subsequent model years, manufacturers shall also track the

total number of engines certified to the alternate NOx FEL cap to show the production volume does not exceed 40 percent of total engine production volume over the four year interim period (2011-2014) in each power category.