

## TITLE 13. CALIFORNIA AIR RESOURCES BOARD

### UPDATED INFORMATIVE DIGEST FOR AMENDMENTS TO HEAVY-DUTY VEHICLE REGULATIONS: 2004 EMISSION STANDARDS; AVERAGING, BANKING, AND TRADING; OPTIONAL REDUCED-EMISSION STANDARDS; CERTIFICATION TEST FUEL; LABELING; MAINTENANCE REQUIREMENTS AND WARRANTIES

#### Proposed Actions and Sections Affected:

In 1994, the Air Resources Board approved a State Implementation Plan (SIP) for ozone. The SIP contains measures M5 and M6, which call for new state and national emission standards for heavy-duty diesel vehicles beginning in 2004. In June 1995, ARB, the United States Environmental Protection Agency (U.S. EPA), and the manufacturers of heavy-duty vehicle engines signed a statement of principles (SOP) calling for harmonization of ARB and U.S. EPA heavy-duty vehicle regulations. The SOP is a cooperative agreement between ARB, U.S. EPA, and the engine manufacturers that recognizes the technological feasibility of significant emission reductions from heavy-duty vehicles. In October 1997, U.S. EPA adopted new emission standards, along with changes to the existing federal averaging, banking, and trading program, and changes to useful life and maintenance requirements for heavy-duty diesel engines. The 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 heavy-duty vehicles nationwide will result in substantial air quality benefits in California and the rest of the country.

#### **I. Amendment of the California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Engines and Vehicles -- Section 1956.8, Title 13, California Code of Regulations (CCR).**

Section 1956.8 includes exhaust emission standards and test procedures, and also incorporates by reference "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles." There are several proposed amendments to Section 1956.8 and the incorporated standards and test procedures, including: mandatory emission standards for heavy-duty diesel-cycle engines beginning in 2004; optional reduced-emission standards for those vehicles; provisions to allow heavy-duty and medium-duty diesel engines to participate in the federal averaging, banking, and trading program; changes to the useful life requirements and maintenance intervals; changes to the certification test fuel requirements; and changes to the nonmethane hydrocarbon measurement test procedures.

#### Mandatory Emission Standards for Heavy-Duty Diesel-cycle Engines

Pursuant to Health and Safety code section 43806, the ARB, in June 1993, and June 1995

adopted amendments to the emission standards and test procedures for urban transit buses and engines and heavy-duty engines and vehicles. The ensuing regulations set the California particulate matter (PM) and oxides of nitrogen (NO<sub>x</sub>) emission standards for all 1996 and later California urban bus engines at 0.05 gram/brake horsepower-hour (g/bhp-hr) and 4.0 g/bhp-hr, respectively. For other heavy-duty engines (exclusive of urban transit buses) the PM and NO<sub>x</sub> emission standards for all 1998 and later California heavy-duty engines and vehicles, were set at 0.1 and 4.0 g/bhp-hr, respectively. As of 1998, U.S. EPA emission standards for heavy-duty vehicles and urban transit buses are the same as the current California standards.

To further reduce emissions, however, in October 1997, U.S. EPA adopted regulations specifying more stringent emission standards for all 2004 and subsequent model year heavy-duty diesel engines (Federal Register, Vol. 62, No. 203, October 21, 1997, pp. 54694 - 54730). The 1990 Clean Air Act Amendments require that California's motor vehicle program be at least as stringent as the U.S. EPA's program. ARB's amendments align California's standards for 2004 and later model year new diesel heavy-duty engines, and for new replacement diesel heavy-duty engines, with the federal requirements. Like the adopted federal requirements, the amendments include a NO<sub>x</sub> plus nonmethane hydrocarbon (NMHC) emission standard of 2.4 g/bhp-hr; or 2.5 g/bhp-hr with a 0.5 g/bhp-hr NMHC cap.

#### Optional Reduced-Emission Standards for Heavy-Duty Diesel Engines

California currently has optional reduced-emission standards for engines in heavy-duty vehicles. The federal program does not. In California, a vehicle owner/operator would need a vehicle certified to an optional reduced-emission standard to generate marketable emission reduction credits. These regulatory amendments include NO<sub>x</sub> plus NMHC optional reduced-emission standards for 2004 and subsequent heavy-duty diesel-cycle engines. The standards range from 1.8 to 0.3 g/bhp-hr NO<sub>x</sub> plus NMHC, in 0.3 g/bhp-hr increments (i.e., 1.8, 1.5, 1.2, 0.9, 0.6, and 0.3 g/bhp-hr NO<sub>x</sub> plus NMHC).

#### Averaging, Banking, and Trading for Heavy-Duty Diesel Engines

The federal averaging, banking, and trading program was designed to provide manufacturers flexibility in meeting NO<sub>x</sub> and PM standards. In 1997 U.S. EPA modified the ABT program to allow credits to be generated for NO<sub>x</sub> plus NMHC, and PM, among other modifications (federal modified ABT program).

In order to align California provisions with the federal program and allow similar flexibility, the amended regulations allow manufacturers of California-certified engines to participate in the federal modified ABT program. Heavy-duty vehicles with diesel-cycle engines, having a gross vehicle weight rating (GVWR) greater than 14,000 pounds, begin participation in 1998. The ABT provisions allow NO<sub>x</sub> credits to be generated and banked in 1998 through 2003. Banked credits could be used beginning in 2004. This provision slightly differs from the federal program (Title 40, Code of Federal Regulations, sections 86.098-15 and 86.004-15), which

allows banked credits to be used before 2004. The amended provisions also allow continued participation in the federal program generating, banking, and trading provisions after 2003.

### Averaging, Banking, and Trading for Medium-Duty Vehicle Engines

Under the federal program, vehicles in the 8,501 and 14,000 pounds GVWR range are considered heavy-duty vehicles. In California those vehicles are currently considered to be medium-duty vehicles, and are regulated under California's medium-duty vehicle program. In 1995, in anticipation of the federal rulemaking, ARB adopted a 2.4 g/bhp-hr NO<sub>x</sub> plus NMHC (or 2.5 with a 0.5 NMHC cap) emission standard for engine-certified medium-duty vehicles beginning in 2004. Therefore, the 2004 standards for those vehicles are already in-line with the recently adopted federal standards (Title 40, Code of Federal Regulations (CFR), section 86.004-11). As noticed on March 6, 1998 in the 45-day notice, ARB proposed to align with the federal program by allowing manufacturers of engines for engine-certified medium-duty vehicles to participate in the federal ABT program beginning in 2004.

As available in the 15-day notice, the amended regulations, as modified, allow the manufacturers of medium-duty diesel engines (MDDEs) to generate California-only ABT credits for NO<sub>x</sub> plus NMHC and PM beginning in 1998 for use in 2004 and later. Pre-2004 medium duty ABT credits could be used on California only if those medium-duty ABT credits are generated in California. In order to qualify for medium-duty ABT credit, MDDE manufacturers would develop a plan for generating credits and submit it to the Executive Officer for approval. Additionally, the definition of the averaging set for the primary weight class over 8,500 and through 14,000 pounds GVWR has been modified to conform with the U.S. EPA's definition of the averaging set for light heavy-duty vehicles. The modification expands the averaging set for the primary weight class over 8,500 through 14,000 pounds to a primary weight class of over 8,500 through 19,500 pounds GVWR. This modification allows manufacturers of engines used in vehicles over 8,500 to 19,500 GVWR to average, bank, or trade credits within the expanded primary weight class. Averaging, banking, or trading of ABT credits that were generated before 2004 would only be allowed for those credits that were generated in California. The amended regulations, as modified, allow MDDE manufacturers flexibility in producing a 50-state product line, while ensuring the air quality benefits of California's medium-duty program.

### Useful life requirements

The amended regulations reference the new useful life definition (Title 40, CFR, section 86.004-2). The amendments extend the useful life requirement for heavy heavy-duty diesel-cycle vehicles to: 435,000 miles; 10 years; or 22,000 hours; whichever occurs first. The useful life requirement applies to all pollutants. For all other heavy-duty engine subcategories, Otto-cycle and diesel-cycle, the useful life requirement is extended to 10 years for all pollutants (the mileage intervals remain unchanged). These amendments align the California useful life definition with the federal definition.

### Maintenance intervals

The amended regulations increase the maintenance intervals for exhaust gas recirculation

systems (except filters and coolers) in Otto-cycle and diesel light heavy-duty engines (14,001 to 19,000 pounds GVWR), to 100,000 miles or 3,000 hours, whichever occurs first. For diesel medium- and heavy heavy-duty engines the maintenance interval is increased to 150,000 miles or 4,500 hours, whichever occurs first. These regulations also provide new maintenance intervals for add-on emission-related components, and catalytic converters in diesel heavy-duty engines. For diesel light heavy-duty engines, the maintenance interval is amended to 100,000 miles or 3,000 hours, whichever occurs first. For diesel medium heavy-duty and heavy heavy-duty engines, the maintenance interval is amended to 150,000 miles or 4,500 hours, whichever occurs first. These amendments align the California maintenance intervals with the federal definition (Title 40, CFR, section 86.004-25).

### Engine Certification Test Fuel

The 1995 amendments to the medium-duty vehicle standards included provisions to allow manufacturers the option of certifying on California diesel fuel. Since California diesel fuel is cleaner burning than federal diesel fuel, this option was considered to be beneficial to engine manufacturers. This option was provided to help manufacturers meet California medium-duty vehicle and engine standards because they are stricter than the current federal standards. In 2004, emission standards for California-certified medium-duty diesel engines will be the same as federal standards. For 1998 through 2003, when the California standards are more stringent, engines could continue to be certified on California diesel fuel. As noticed during the 45-day comment period, the proposed amendment to the test procedures would have required that medium-duty diesel engines be certified on federal fuel beginning in 2004 (see federal fuel specifications in Title 40, CFR, section 86.1313-90). As modified for the 15-day notice, the amended regulation allows manufacturers of MDDEs to certify on California fuel through 2005. This modification allows MDDE manufacturers additional flexibility in producing a 50-state product line.

### NMHC test method

Existing NMHC measurement procedures for heavy-duty diesel engines are to be used through 2003. Beginning with the 2004 model year, the amended regulation provides the following three options to NMHC measurement procedures: 1) use a total hydrocarbons (THC) measurement in place of an NMHC measurement; 2) use a measurement procedure selected by the manufacturer with prior approval of the Executive Officer; or 3) subtract 3 percent from the measured THC value to obtain an NMHC value. Heavy-duty engines using natural gas would have the added option of measuring NMHC through direct quantification of individual species by gas chromatography. The methodology would have to be specified at time of certification and would remain the same for the engine family throughout the engines' useful lives.

### Rebuild requirements

The ARB staff is proposing provisions to help ensure that engines are rebuilt to equivalent to or lower-emission configurations than the original engines. These requirements

are the same as adopted federal requirements.

**II. Amendment of the California Motor Vehicle Emission Control Label Specifications -- Section 1965, Title 13, CCR.**

The amendments to the California Motor Vehicle Emission Control Label Specifications help identify those diesel heavy-duty engines that are certified to the proposed optional NO<sub>x</sub> plus NMHC standards. The information added to the emission control label or supplemental emission control label identifies the optional standard to which the engine is certified (or standards, for multi-fuel mode engines). This information could be used as part of an incentive program for the early introduction of low-emission heavy-duty vehicles.

**III. Amendment of the Useful life Definition for Heavy-Duty Engines and Vehicles for the Procedures for In-Use Vehicle Voluntary and Influenced Recalls -- Section 2112, Title 13, CCR.**

The useful life definition is not only referenced in the regulations containing the emission standards, it is also referenced in the regulations dealing with in-use recalls. The amended regulation for the useful life definition in Section 2112 is specifically applicable to Chapter 2 - Enforcement of Vehicle Emission Standards and Surveillance Influenced Recalls. The useful life requirement is extended for all pollutants standards for 2004 and later heavy heavy-duty vehicles to: 435,000 miles, 10 years, or 22,000 hours, whichever occurs first. For all other heavy-duty subcategories the useful life requirement is extended to 10 years, with the mileage intervals remaining unchanged. These requirements are consistent with what has been adopted by the U.S. EPA.

**IV. Amendment of the Defects Warranty Requirements for 1979 Through 1989 Model Passenger Cars, Light-duty Trucks, and Medium-Duty Vehicles; 1979 and Subsequent Model Motorcycles and Heavy-duty Vehicles; and Motor Vehicles Engines Used in Such Vehicles --Section 2036.**

The U.S. EPA diesel heavy-duty regulations adopted in 1997 also contained revisions to the warranty provisions for both diesel and Otto-cycle engines. Accordingly, these regulations require the warranty period be not less than the basic mechanical warranty that the manufacturer provides the individual engine purchaser. This amendment would align California's warranty provisions with U.S. EPA's.

**V. Modifications to Improve Clarity and Correct Errors.**

Throughout the amended regulations other minor, nonsubstantive modifications have been made to improve the clarity of the regulations and to correct minor typographical errors.

