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RESOURCES AGENCY OF CALIFORNIA

State of California
AIR RESOURCES BOARD

Resolution 98-17

April 23, 1998

Agenda Item No.: 98-4-1

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in Section 43000 of the Health and Safety Code, the Legislature has declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the state and, in Sections 39002 and 39003 of the Health and Safety Code, has charged the Board with the responsibility of systematically addressing the serious air pollution problem caused by motor vehicles;

WHEREAS, Sections 43013, 43101, and 43104 of the Health and Safety Code authorize the Board to adopt motor vehicle emission standards, in-use performance standards, and test procedures, which it finds to be necessary, cost-effective, and technologically feasible;

WHEREAS, Section 43018 of the Health and Safety Code directs the Board to endeavor to achieve the maximum degree of emissions reduction possible from vehicular sources to accomplish the attainment of state ambient air quality standards by the earliest practicable date;

WHEREAS, the regulations proposed by the staff set forth the engines and vehicles to which the regulations would apply; standards and test procedures; labeling requirements; useful life definition; and warranty and rebuild requirements;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to substantially reduce or avoid such impacts;

WHEREAS, the Board has considered the impact of the proposed regulatory action on the economy of the state;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board finds that:

It is necessary and appropriate that the proposed regulations require engine manufacturers to certify diesel engines used in California heavy-duty vehicles to the proposed mandatory oxides of nitrogen plus nonmethane hydrocarbon emission standards, beginning in 2004, to provide for reductions of oxides of nitrogen and hydrocarbons;

It is necessary and appropriate that the proposed regulations establish the proposed optional reduced-emission standards for 2004 and later heavy-duty vehicles;

It is necessary and appropriate that the proposed regulations provide for participation in the federal averaging, banking, and trading program for heavy-duty diesel engines beginning in 1998 for credit generation and for medium-duty (having a gross vehicle weight rating over 8,500 and through 14,001 pounds) diesel engines beginning in 1998 for credit generation in California, with credit use for both classes beginning with the 2004 model year;

It is necessary and appropriate that the proposed regulations extend the useful life and equipment maintenance intervals for heavy-duty diesel and Otto-cycle engines, equivalent to the final federal rulemaking;

It is necessary and appropriate that the proposed regulations require manufacturers to certify medium-duty diesel engines, in vehicles with a gross vehicle weight rating over 8,500 and through 14,000 pounds, on federal fuel beginning in 2006;

It is necessary and appropriate that the proposed regulations establish modified nonmethane hydrocarbon test methods, modified labeling requirements, modified warranty provisions, modified rebuild requirements, and new maintenance instructions for the 2004 and later model year heavy-duty diesel and Otto-cycle engines which would harmonize these requirements with the federal regulations; and

It is necessary and appropriate that the proposed regulations differ somewhat from the federal requirements for durability testing, alternative fuel engine testing, the formaldehyde emission calculations, and the incorporation of California-specific sales and production data;

WHEREAS, the Board finds that adoption of the regulations approved herein will not have a significant adverse environmental impact and that the regulations are projected to have a positive air quality impact.

WHEREAS, the Board further finds that no alternative considered by the Board would be more effective in carrying out the purpose for which the regulations are proposed or would be as effective and less burdensome to affected private persons.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves amendments to sections 1956.8, 1965, 2112, and 2036 of Title 13, California Code of Regulations, and to the heavy-duty test procedures incorporated by reference in section 1956.8, as noticed on March 6, 1998, with the modifications as set forth in Attachment A hereto.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt the amendments, with the modifications as set forth in Attachment A, after making them available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make further modifications as may be appropriate in light of the comments received or as necessary for consistency with the modifications in Attachment A, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board hereby determines that the regulations adopted herein will not cause California motor vehicle emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards.

BE IT FURTHER RESOLVED that the Board hereby finds that separate California emission standards and test procedures are necessary for medium-duty diesel engines (vehicles having a gross vehicle weight rating over 8,500 through 14,000 pounds) until 2004.

BE IT FURTHER RESOLVED that the Board finds that the California emission standards and test procedures as adopted herein will not cause the California requirements to be inconsistent with section 202(a) of the Clean Air Act and raise no new issues affecting previous waiver determinations of the Administrator of the Environmental Protection Agency pursuant to section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall, upon adoption, forward the regulations to the Environmental Protection Agency with a request for a waiver or confirmation that the regulations are within the scope of an existing waiver of federal preemption pursuant to section 209 (b) of the Clean Air Act, as appropriate.

I hereby certify that the above is a true and correct copy of Resolution 98-17, as adopted by the Air Resources Board.

Pat Hutchens
Pat Hutchens, Clerk of the Board

State of California
AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES
FOR 1985 AND SUBSEQUENT MODEL
HEAVY-DUTY DIESEL-ENGINES AND VEHICLES

Adopted: April 8, 1985
Amended: July 29, 1986
Amended: January 22, 1990
Amended: May 15, 1990
Amended: December 26, 1990
Amended: July 12, 1991
Amended: October 23, 1992
Amended: October 22, 1993
Amended: March 24, 1994
Amended: September 22, 1994
Amended: June 29, 1995
Amended: June 4, 1997
Amended: [insert date of finalized amendment]

NOTE: This document is printed in a style to indicate amendments to the existing California standards and test procedures. The amendments made to the noticed rulemaking of the existing California standards and test procedures are shown in redline to indicate additions to the text and *strikeout italics* to indicate deletions.

This document incorporates by reference, as the 45-day notice, various sections of the Code of Federal Regulations, some with modifications. Modifications to portions of paragraphs in the Federal language are indicated by underline for additions and ~~strikeout~~ for deletions. Larger portions of Federal language for a specific section which is not to be included in these procedures are denoted by the word "DELETE" and larger portions of new California language are indicated by "REPLACE WITH" or "INSERT". The symbols "*****" and "....." mean that the remainder of the federal text for a specific section, which is not shown in these procedures, has been included by reference, with only the printed text changed. The symbols "#####" mean that the remainder of the text of these procedures, which is not shown in this amendment document, has not been changed.

This document indicates changes to the 45-day notice. Deletions from the 45-day notice are indicated by ~~double underline strikeout~~. Insertions to the 45-day notice are indicated by double underline.

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1985 AND SUBSEQUENT MODEL HEAVY-DUTY DIESEL-ENGINES AND VEHICLES

The following provisions of Subparts A, I, and N, Part 86, Title 40, Code of Federal Regulations, as adopted or amended by the U.S. Environmental Protection Agency on the date listed, and only to the extent they pertain to the testing and compliance of exhaust emissions from heavy-duty Diesel-engines and vehicles, are adopted and incorporated herein by this reference as the California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles, except as altered or replaced by the provisions set forth below.

The federal regulations contained in the Subparts identified above which pertain to oxides of nitrogen emission averaging shall not be applicable to these procedures except for diesel engines and vehicles produced in the 1998 and subsequent model years. The federal regulations contained in the Subparts identified above which pertain to particulate emission averaging shall not be applicable to these procedures for 1996 and later model engines and vehicles except for diesel engines and vehicles produced in the 1998 and subsequent model years. The smoke exhaust test procedures shall be applicable to California petroleum-fueled, liquefied-petroleum gas-fueled, and compressed-natural gas fueled heavy-duty Diesel engines and vehicles for 1988 and later model years.

The federal regulations contained in the subparts identified above which pertain to nonconformance penalty shall not be applicable.

The federal regulations contained in the subparts identified above which pertain to evaporative emissions shall not be applicable to these procedures. Applicable regulations pertaining to evaporative emissions are contained in "California Evaporative Emission Standards and Test Procedures for 1978 and Subsequent Model Motor Vehicles," as incorporated in Title 13, California Code of Regulations, Section 1976.

Starting with the 1990 model year, these regulations shall be applicable to all heavy-duty Diesel natural-gas-fueled and liquefied-petroleum gas-fueled engines (and vehicles) including those engines derived from existing Diesel engines. For any engine which is not a distinctly Diesel engine nor derived from such, the Executive Officer shall determine whether the engine shall be subject to these regulations or alternatively to the heavy-duty Otto-cycle engine regulations, in consideration of the relative similarity of the engine's torque-speed characteristics and vehicle applications with those of Diesel and Otto-cycle engines.

The regulations concerning the certification of methanol-fueled diesel urban bus engines are not applicable in California until 1991 and subsequent model years. The regulations concerning the certification of all other methanol fueled diesel engines and vehicles are not applicable in California until 1993 and subsequent model years.

Regulations concerning the certification of incomplete medium-duty diesel low-emission vehicles and engines and ultra-low-emission vehicles and engines operating on any fuel are applicable for the 1992 and subsequent model years.

Adopt and amend § 86.098-15, Title 40, Code of Federal Regulations to read:

§ 86.098-15 NOx and particulate averaging, trading, and banking for heavy-duty engines, and NOx plus NMHC and particulate averaging, trading, and banking for medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating .

[October 21, 1997]

Introductory paragraph DELETE

New introductory paragraph (a) INSERT:

(a) Except as otherwise noted, references in this subsection to engines, heavy-duty engines or HDEs shall include medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for sale in California for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating. Except as otherwise noted, references to NOx averaging, banking and trading programs shall mean NOx plus NMHC averaging, trading and banking programs when applied to such medium-duty diesel-cycle engines.

(a)(1) Heavy-duty engines eligible for NOx and particulate averaging, trading and banking programs are described in the applicable emission standards sections in this subpart or in Title 13 California Code of Regulations §1956.8(h) . Manufacturers of heavy-duty engines certified for use in vehicles sold in California must utilize the requirements of paragraph (j) of this section for the inclusion of such engines in averaging, trading and banking programs. All heavy-duty engine families which include any engines labeled for use in clean-fuel vehicles as specified in 40 CFR part 88 are not eligible for these programs. Participation in these programs is voluntary.

(b) (6) If EPAARB or the manufacturer determines that a reporting error occurred on an end-of-year report previously submitted to EPAARB under this section, the manufacturer's credits and credit calculations will be recalculated. Erroneous positive credits will be void. Erroneous negative balances may be adjusted by EPAARB for retroactive use.

(i) If EPAARB review of a manufacturer's end-of-year report indicates a credit shortfall, the manufacturer will be permitted to purchase the necessary credits to bring the credit balance for that engine family to zero, at the ratio of 1.2 credits purchased for every credit needed to bring the balance to zero. If sufficient credits are not available to bring the credit balance for the engine family in question to zero, EPAARB may void the certificate for that engine family ab initio.

(ii) If within 180 days of receipt of the manufacturer's end-of-year report, EPAARB review determines a reporting error in the manufacturer's favor (i.e. resulting in a positive credit balance) or if the manufacturer discovers such an error within 180 days of EPAARB receipt of the end-of-year report, the credits will be restored for use by the manufacturer.

(c)(1) (iii) For purposes of the equations in paragraphs (c)(1)(i) and (ii) of this section:

Std = the current and applicable heavy-duty engine NOx or particulate emission standard in grams per brake horsepower hour or grams per Megajoule. In the case of medium-duty engines, Std= the Tier 1 standard for the 1998 through 2001 model years, the LEV standard for the 2002 through 2003 model years, and the ULEV standard for the 2004 and subsequent model years.

FEL = the NOx or particulate family emission limit for the engine family in grams per brake horsepower hour or grams per Megajoule.

CF = a transient cycle conversion factor in BHP-hr/mi or MJ/mi, as given in paragraph (c)(2) of this section.

UL = the useful life, or alternative life as described in paragraph (f) of § 86.094-21, for the given engine family in miles.

Production = the number of engines produced for U.S. sales within the given engine family during the model year. Quarterly production projections are used for initial certification. Actual production is used for end-of-year compliance determination. In the case of medium-duty engines, Production= the number of engines produced for California sales within the given engine family during the model year.

Discount = a one-time discount applied to all credits to be banked or traded within the model year generated. The discount applied here is 0.8. Banked credits traded in a subsequent model year will not be subject to an additional discount. Banked credits used in a subsequent model year's averaging program will not have the discount restored.

(iv) For medium-duty diesel-cycle engines certified in the 2004 and 2005 model years under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating, an additional adjustment to the Std value described in (c)(1)(iii) above, allowing for certification using Federal certification fuel may be made on an individual engine family basis as determined by the ARB Executive Officer upon application by the engine manufacturer.

(d) Averaging sets for NOx emission credits: The averaging and trading of NOx emission credits will only be allowed between heavy-duty engine families intended for use in vehicles over 14,000 pounds gross vehicle weight rating, in the same averaging set and in the same regional category. Engines produced for sale in California constitute a separate regional category than engines produced for sale in the other 49 states. Banking and trading are not applicable to engines sold in California. Engines sold in California may only be used to generate credits to be banked for use in the year 2004

and later, according to paragraph (j) of this section. The averaging sets for the averaging and trading of NOx emission credits for heavy-duty engines are defined as follows:

(d)(2) For diesel cycle heavy-duty engines:

(i) Each of the three primary intended service classes for heavy-duty diesel engines, as defined in § 86.090-2, constitute an averaging set. Averaging and trading among all diesel-cycle engine families within the same primary service class is allowed.

(ii) Urban buses are treated as members of the primary intended service class where they otherwise would fall.

(iii) Medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating constitute an averaging set.

(e) Averaging sets for particulate emission credits. The averaging and trading of particulate emission credits will only be allowed between diesel cycle heavy-duty engine families intended for use in vehicles over 14,000 pounds gross vehicle weight rating, in the same averaging set and in the same regional category. Engines produced for sale in California constitute a separate regional category than engines produced for sale in the other 49 states. Banking and trading are not applicable to engines sold in California. Engines sold in California may only be used to generate credits to be banked for use in the year 2004 and later, according to paragraph (j) of this section. The averaging sets for the averaging and trading of particulate emission credits for diesel cycle heavy-duty engines are defined as follows:

(1) Engines intended for use in urban buses constitute a separate averaging set from all other heavy-duty engines. Averaging and trading between diesel cycle bus engine families is allowed.

(2) For heavy-duty engines, exclusive of urban bus engines, each of the three primary intended service classes for heavy-duty diesel cycle engines, as defined in § 86.090-2, constitute an averaging set. Averaging and trading between diesel-cycle engine families within the same primary service class is allowed.

(3) Otto cycle engines may not participate in particulate averaging, trading, or banking.

(4) Medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations 1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating constitute an averaging set.

(f)(1)(ii) Manufacturers may bank credits only after the end of the model year and after actual credits have been reported to EPAARB in the end-of-year report. During the model year and before submittal of the end-of-year report, credits originally designated in the certification process for banking will be considered reserved and may be redesignated for trading or averaging.

(f)(3)(i) Banked credits may be used in averaging, or in trading, or in any combination thereof, during the certification period. Credits declared for banking from the previous model year but not reported to EPAARB may also be used. However, if EPAARB finds that the reported credits can not be proven, they will be revoked and unavailable for use.

(i) DELETE

(j) ~~Optional program~~ Program for early banking. Provisions set forth in paragraphs (a) through (i) of this section apply ~~except as specifically stated otherwise~~ only as allowed in paragraph (j) of this section. The procedures of paragraph (j) must be utilized for engines certified for sale in California to participate in ABT programs.

(1) To be eligible for the ~~optional program~~ described in paragraph (j) of this section, the following must apply:

(i) Credits are generated from diesel cycle heavy-duty engines certified and labeled for use in California vehicles of more than 14,000 pounds gross vehicle weight rating.

(ii) During certification, the manufacturer shall declare its intent to include specific engine families in the program described in this paragraph (j). Separate declarations are required for each program and no engine families may be included in both programs in the same model year.

(2) Credit generation and use.

(i) Credits shall only be generated by 1998 and later model year engine families.

(ii) Credits may only be used for 2004 and later model year heavy-duty diesel engines. When used with 2004 and later model year engines, NOx credits may be used to meet the NOx plus NMHC standard, except as otherwise provided in § 86.004-11(a)(1)(i)(D), and under the requirements of 86.004-15.

(iii) DELETE

(3) Program flexibilities.

(i) NOx and PM credits that are banked until model year 2004 under this paragraph (j) may be used in 2004 or any model year thereafter without being forfeited due to credit age. This supersedes the requirement in paragraph (f)(2)(i) of this section.

(ii) There are no regional category restraints for averaging, trading, and banking of credits generated under the program described in paragraph (j) of this section, except as noted in paragraphs (d), (e), and (j)(1)(i) of this section. This supersedes the regional category provisions described in the opening text of paragraphs (d) and (e) of this section.

(iii) Credit discounting.

(A) For NOx and PM credits generated under this paragraph (j) from heavy-duty engine families with NOx certification levels greater than 3.5 grams per brake horsepower-hour for oxides of nitrogen, a Discount value of 0.9 shall be used in place of 0.8 in the credit availability equation in paragraph (c)(1) of this section. For credits generated from medium duty engine families, a Discount value of 0.9 shall be used if the NOx plus NMHC value is greater than the applicable standard required in subparagraph (c)(1)(iii) less 0.5 g/BHP-hr.

(B) For NOx and PM credits generated under this paragraph (j) from heavy-duty engine families with NOx certification levels less than or equal to 3.5 grams per brake horsepower-hour for oxides of nitrogen, a Discount value of 1.0 shall be used in place of 0.8 in the credit availability equation in paragraph (c)(1) of this section. For credits generated from medium duty engine families, a Discount value of 1.0 shall be used if the NOx plus NMHC value is less than the applicable standard required in subparagraph (c)(1)(iii) less 0.5 g/BHP-hr.

(iv) Credit apportionment. At the manufacturer's option, marketable emission reduction credits for NOx, for use in emission reduction credit programs other than ABT, may be generated based upon engine certification to the optional reduced-emission NOx certification standards of § 86.098-11(e). Use of any marketable emission reduction credits generated must meet the requirements of the individual emission reduction credit program where the credits will be applied. ~~credits generated under the provisions described in this section may be sold to or otherwise provided to another party for use in programs other than the averaging, trading and banking program described in this section.~~

(A) ~~The manufacturer shall pre-identify two emission levels per engine family for the purposes of credit apportionment. One emission level shall be the FEL and the other shall be the level of the standard that the engine family is required to certify to under § 86.098-11. For each engine family, the manufacturer may report engine sales in two categories, "ABT-only credits" and "nonmanufacturer-owned credits". For those engine sales used to generate ABT credits, the manufacturer shall report engine sales in the category "ABT-only credits". For those engine sales certified to generate marketable emission reduction credits for NOx, the manufacturer shall report engine sales in the category "nonmanufacturer-owned credits".~~

(1) For engine sales reported as "ABT-only credits", the credits generated must be used solely in the ABT program described in this section or §86.004-15.

(2) The engine manufacturer may declare a portion of engine sales "nonmanufacturer-owned credits" and ~~this portion of the credits generated between the standard and the FEL, based on the calculation in paragraph (c)(1) of this section;~~ any marketable NOx credits generated based upon such sales would belong to another party. For ABT, the manufacturer may not generate any credits for the engine sales reported as "nonmanufacturer-owned credits". ~~Engines reported as "nonmanufacturer-owned credits" shall comply with the FEL and the requirements of the ABT program in all other respects.~~

(B) Only manufacturer-owned credits resulting from engine sales reported as "ABT-only credits" shall be used in the averaging, trading, and banking provisions described in this section.

(C) Credits shall not be double-counted. Credits used in the ABT program may not be provided to an engine purchaser for use in another program.

(D) Manufacturers shall determine and state the number of engines sold as "ABT-only credits" and "nonmanufacturer-owned credits" in the end-of-model year reports required under § 86.098-23.

(iv) For medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations 1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating:

(1) Credits may be generated by an alternative mechanism proposed by the engine manufacturer and approved by the Executive Officer of the ARB. The alternative credit-generating mechanism shall not include anything expressly prohibited under the federal ABT program, such as cross-class or cross-fuel trading.

(2) Manufacturers must annually submit a proposed plan for generating credits to the Executive Officer of the ARB and have it approved prior to sale of that model year engines in California.

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Adopt and amend § 86.004-15, Title 40, Code of Federal Regulations to read:

§ 86.004-15 NOx and particulate averaging, trading, and banking for heavy-duty engines, and NOx plus NMHC and particulate averaging, trading, and banking for medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating.

[October 21, 1997]

New introductory paragraph (a) INSERT:

(a) Except as otherwise noted, references in this subsection to engines, heavy-duty engines or HDEs shall include medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for sale in California for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating. Except as otherwise noted, references to NOx averaging, banking and trading programs shall mean NOx plus NMHC averaging, trading and banking programs when applied to such medium-duty diesel-cycle engines.

(a)(1) Heavy-duty engines eligible for NOx, NOx plus NMHC, and particulate averaging, trading and banking programs are described in the applicable emission standards sections in this subpart or in Title 13 California Code of Regulations §1956.8(h), with the addition that engines certified and labeled for use in California vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating may also participate in ABT programs, subject to the requirements of this section. All heavy-duty engine families which include any engines labeled for use in clean-fuel vehicles as specified in 40 CFR part 88 are not eligible for these programs. Participation in these programs is voluntary.

(b) Participation in the NOx, NOx plus NMHC, and/or particulate averaging, trading, and banking programs shall be done as follows.

(1) During certification, the manufacturer shall:

(i) Declare its intent to included specific engine families in the averaging, trading and/or banking programs. Separate declarations are required for each program and for each pollutant (i.e., NOx, NOx plus NMHC, and particulate).

(ii) Declare an FEL for each engine family participating in one or more of these three programs.

(A) The FEL must be to the same level of significant digits as the emission standard (one-tenth of a gram per brake horsepower-hour for NOx, NOx plus NMHC, emissions and one-hundredth of a gram per brake horsepower-hour for particulate emissions).

(B) In no case may the FEL exceed the upper limit prescribed in the section concerning the applicable heavy-duty engine NOx, NOx plus NMHC, and particulate emission standards. In the case of medium-duty engines, the FEL is subject to the same upper limit as required for heavy-duty engines.

(iii) Calculate the projected emission credits (positive or negative) based on quarterly production projections for each participating family and for each pollutant, using the applicable equation in paragraph (c) of this section and the applicable factors for the specific engine family.

(iv)(A) Determine and state the source of the needed credits according to quarterly projected production for engine families requiring credits for certification.

(B) State where the quarterly projected credits will be applied for engine families generating credits.

(C) Credits may be obtained from or applied to only engine families within the same averaging set as described in paragraphs (d) or (e) of this section. Credits available for averaging, trading, or banking as defined in § 86.090-2, may be applied exclusively to a given engine family, or reserved as defined in § 86.091-2.

(D) Credits generated before the year 2004 to be used to certify medium-duty engines in the year 2004 and later, must have been generated through the sale of engines in California.

(2) Based on this information each manufacturer's certification application must demonstrate:

(i) That at the end of model year production, each engine family has a net emissions credit balance of zero or more using the methodology in paragraph (c) of this section with any credits obtained from averaging, trading or banking.

(ii) The source of the credits to be used to comply with the emission standard if the FEL exceeds the standard, or where credits will be applied if the FEL is less than the emission standard. In cases where credits are being obtained, each engine family involved must state specifically the source (manufacturer/engine family) of the credits being used, including the year of generation of the credits being used and whether the credits were generated from engines sold in California or from 49-state engines. In cases where credits are being generated/supplied, each engine family involved must state specifically the designated use (manufacturer/engine family or reserved) of the credits involved. All such reports shall include all credits involved in averaging, trading or banking.

(3) During the model year manufacturers must:

(i) Monitor projected versus actual production to be certain that compliance with the emission standards is achieved at the end of the model year.

(ii) Provide the end-of-model year reports required under § 86.001-23.

(iii) For manufacturers participating in emission credit trading, maintain the quarterly records required under § 86.091-7(c)(8).

(4) Projected credits based on information supplied in the certification application may be used to obtain a certificate of conformity. However, any such credits may be revoked based on review of end-of-model year reports, follow-up audits, and any other compliance measures deemed appropriate by the Administrator.

(5) Compliance under averaging, banking, and trading will be determined at the end of the model year. Engine families without an adequate amount of NO_x, NO_x plus NMHC, and/or particulate emission credits will violate the conditions of the certificate of conformity. The certificates of conformity may be voided *ab initio* for engine families exceeding the emission standard.

(b)(6) If EPA/ARB or the manufacturer determines that a reporting error occurred on an end-of-year report previously submitted to EPA/ARB under this section, the manufacturer's credits and credit calculations will be recalculated. Erroneous positive credits will be void. Erroneous negative balances may be adjusted by EPA/ARB for retroactive use.

(i) If EPA/ARB review of a manufacturer's end-of-year report indicates a credit shortfall, the manufacturer will be permitted to purchase the necessary credits to bring the credit balance for that engine family to zero, using the discount specified in paragraph (c)(1) of this section on the ratio of credits purchased for every credit needed to bring the balance to zero. If sufficient credits are not available to bring the credit balance for the family in question to zero, EPA/ARB may void the certificate for that engine family *ab initio*.

(ii) If within 180 days of receipt of the manufacturer's end-of-year report, EPA/ARB review determines a reporting error in the manufacturer's favor (i.e., resulting in a positive credit balance) or if the manufacturer discovers such an error within 180 days of EPA/ARB receipt of the end-of-year report, the credits will be restored for use by the manufacturer.

(c)(1)(iv) For medium-duty diesel-cycle engines certified in the 2004 and 2005 model years under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating, an additional adjustment to the Std value described in (c)(1)(iii) above, allowing for certification using Federal certification fuel may be made on an individual engine family basis as determined by the ARB Executive Officer upon application by the engine manufacturer.

(c)(2)(ii) When more than one configuration is chosen by EPA/ARB to be tested in the certification of an engine family (as described in § 86.085-24), the conversion factor used is to be based upon a

production weighted average value of the configurations in an engine family to calculate the conversion factor.

(d)(2) For NOx plus NMHC credits from diesel-cycle heavy-duty engines:

(i) Each of the three primary intended service classes for heavy-duty diesel engines, as defined in § 86.004-2, constitute an averaging set. Averaging and trading among all diesel-cycle engine families within the same primary service class is allowed. In addition, diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating also constitute an averaging set eligible to participate in ABT programs beginning with the 2004 model year.

(ii) Urban buses are treated as members of the primary intended service class where they otherwise would fall.

(iii) Medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating constitute an averaging set.

(e)(2) For heavy-duty engines, exclusive of urban bus engines, each of the three primary intended service classes for heavy-duty diesel cycle engines, as defined in § 86.004-2, constitute an averaging set. Averaging and trading between diesel-cycle engine families within the same primary service class is allowed. In addition, diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating, may also constitute an averaging set eligible to participate in ABT programs beginning with the 2004 model year.

(3) Otto cycle engines may not participate in particulate averaging, trading, or banking.

(4) Medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating constitute an averaging set.

(f)(1)(ii) Manufacturers may bank credits only after the end of the model year and after actual credits have been reported to EPAARB in the end-of-year report. During the model year and before submittal of the end-of-year report, credits originally designated in the certification process for banking will be considered reserved and may be redesignated for trading or averaging.

(f)(3) Use of banked emission credits. The use of banked credits shall be within the averaging set and other restrictions described in paragraphs (d) and (e) of this section, and only for the following purposes:

(i) Banked credits may be used in averaging, or in trading, or in any combination thereof, during the certification period. Credits declared for banking from the previous model year but not reported to EPA/ARB may also be used. However, if EPA/ARB finds that the reported credits can not be proven, they will be revoked and unavailable for use.

(ii) Banked credits may not be used for NO_x, NO_x plus NMHC, or particulate averaging and trading to offset emissions that exceed an FEL. Banked credits may not be used to remedy an in-use nonconformity determined by a Selective Enforcement Audit or by recall testing. However, banked credits may be used for subsequent production of the engine family if the manufacturer elects to recertify to a higher FEL.

(iii) Banked NO_x credits from 2003 and prior may be used in place of NO_x plus NMHC credits after 2003 provided that they are used in the correct averaging set and the NO_x credits have not expired.

(iv) Diesel-cycle engines certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating, may not be certified using banked credits which were generated from the sale of engines sold prior to the 2004 model year. Banked credits generated before the 2004 model year to be applied toward the certification of medium-duty engines to be certified under Title 13 California Code of Regulations §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating, must have been generated through the sale of eligible engines within California. Credits generated before the 2004 model year from medium-duty engines sold outside of California may not be used to certify medium-duty engines for sale in California.

(i) DELETE

(j) Credit apportionment. At the manufacturer's option, marketable emission reduction credits for NO_x plus NMHC, for use in emission reduction credit programs other than ABT, may be generated based upon engine certification to the optional reduced-emission NO_x plus NMHC certification standards of § 86.004-11(e). Use of any marketable emission reduction credits generated must meet the requirements of the individual emission reduction credit program where the credits will be applied. ~~credits generated from diesel-cycle heavy-duty engines under the provisions described in this section may be sold to or otherwise provided to another party for use in programs other than the averaging, trading and banking program described in this section.~~

~~(1) The manufacturer shall pre-identify two emission levels per engine family for the purposes of credit apportionment. One emission level shall be the FEL and the other shall be the level of the~~

~~standard that the engine family is required to certify to under § 86.004-11. For each engine family, the manufacturer may report engine sales in two categories, "ABT-only credits" and "nonmanufacturer-owned credits". For those engine sales used to generate ABT credits, the manufacturer shall report engine sales in the category "ABT-only credits". For those engine sales certified to generate marketable emission reduction credits for NOx, the manufacturer shall report engine sales in the category "nonmanufacturer-owned credits".~~

(i) For engine sales reported as "ABT-only credits", the credits generated must be used solely in the ABT program described in this section.

(ii) ~~The engine manufacturer may declare a portion of engine sales "nonmanufacturer-owned credits" and this portion of the credits generated between the standard and the FEL, based on the calculation in paragraph (c)(1) of this section, any marketable NOx credits generated based upon such sales would belong to the engine purchaser. For ABT, the manufacturer may not generate any credits for the engine sales reported as "nonmanufacturer-owned credits". Engines reported as "nonmanufacturer-owned credits" shall comply with the FEL and the requirements of the ABT program in all other respects.~~

(2) Only manufacturer-owned credits resulting from engine sales reported as "ABT-only credits" shall be used in the averaging, trading, and banking provisions described in this section.

(3) Credits shall not be double-counted. Credits used in the ABT program may not be provided to an engine purchaser for use in another program.

(4) Manufacturers shall determine and state the number of engines sold as "ABT-only credits" and "nonmanufacturer-owned credits" in the end-of-model year reports required under § 86.098-23.

(1) For medium-duty diesel-cycle engines certified under Title 13 California Code of Regulations 1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating:

(1) Credits may be generated by an alternative mechanism proposed by the engine manufacturer and approved by the Executive Officer of the ARB. The alternative credit-generating mechanism shall not include anything expressly prohibited under the federal ABT program, such as cross-class or cross-fuel trading.

(2) Manufacturers must annually submit a proposed plan for generating credits to the Executive Officer of the ARB and have it approved prior to sale of that model year vehicles in California.

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Adopt and amend § 86.1313-90, Title 40 Code of Federal Regulations to read:

§ 86.1313-90 Fuel Specifications. April 11, 1989.

* * * * *

(b)(2) Except as noted below, petroleum fuel for diesel engines ... shall be used. For 1993 and subsequent model-year diesel-fueled engines, the petroleum fuel used in exhaust emissions testing may meet the specifications in Table N94-2 of 40 Code of Federal Regulations section 86.1313-94(b)(2), as adopted August 21, 1990, or substantially equivalent specifications approved by the Executive Officer as an option to the specifications in Table N90-2. For 1995 ~~and subsequent through 2003~~ through 2005 model-year medium-duty diesel-fueled engines, and for 1996 and 1997 model-year urban bus engines only, the petroleum fuel used in exhaust emissions testing may meet the specifications listed below, or substantially equivalent specifications approved by the Executive Officer, as an option to the specifications in Table N90-2. Where a manufacturer elects pursuant to this subparagraph to conduct exhaust emission testing using the specifications in Table N94-2, or the specifications listed below, the Executive Officer shall conduct exhaust emission testing with the diesel fuel meeting the specifications elected by the manufacturer.

Fuel Property	Limit	Test Method ^a
Natural Cetane Number	47-55	D613-86
Distillation Range, °F		Title 13 CCR, §2282(g)(3)
IBP	340-420	
10% point	400-490	
50% point	470-560	
90% point	550-610	
EP	580-660	
API Gravity, degrees	33-39	D287-82
Total Sulfur, wt. %	0.01-0.05	Title 13 CCR, §2282(g)(3)
Nitrogen Content, ppmw	100-500	Title 13 CCR, §2282(g)(3)
Total Aromatic Hydrocarbons, vol.%	8-12	Title 13 CCR, §2282(g)(3)
Polycyclic Aromatic		
Hydrocarbons, wt. % (max.)	1.4	Title 13 CCR, §2282(g)(3)
Flashpoint, °F (max)	130	D 93-80
Viscosity @ 40°F, centistokes	2.0-4.1	D 445-83

^a ASTM specifications unless otherwise noted. A reference to a subsection of Title 13, CCR, §2282 means the test method identified in that subsection for the particular property. A test method other than that specified may be used following a determination by the Executive Officer that the other method produces results equivalent to the results of the specified method.

(b)(3) Except as noted below, petroleum fuel for diesel engines ... shall be used. For 1993 and subsequent model-year diesel-fueled engines, excluding the 1995 ~~and subsequent through 2003~~ through 2005 model-year medium-duty diesel-fueled engines referenced below, the petroleum fuel used in service accumulation may meet the specifications in Table N94-3 of 40 Code of Federal Regulations section 86.1313-94(b)(3), as adopted August 21, 1990, or substantially equivalent specifications approved by the Executive Officer as an option to the specifications in Table N90-3. For 1995 ~~and subsequent through 2003~~ through 2005 model-year medium-duty diesel-fueled engines, and for 1996 and 1997 model-year urban bus engines only, diesel fuel representative of commercial diesel fuel which will be generally available through retail outlets shall be used in service accumulation.

(b)(4)(i) Methanol fuel used in service accumulation of 1991 through 1993 model-year methanol-fueled diesel engines shall be representative of commercially available methanol fuel. Methanol used in fuel for exhaust emission testing of 1991 through 1993 model-year methanol-fueled diesel engines shall be chemical grade methanol. The specifications set forth in subparagraph (b)(4)(ii) may be used as an option for 1993 model-year engines.

(b)(4)(ii) Methanol fuel specifications for 1994 and subsequent model-year methanol-fueled diesel engines.

Mileage-accumulation fuel: For methanol-fueled diesel-cycle methanol engines, fuel which meets the specifications listed in Title 13, CCR, Section 2292.1 or 2292.2, as applicable.

Emission-testing fuel: For methanol-fueled diesel-cycle methanol engines, fuel which meets the specifications listed in Title 13, CCR, Section 2292.1 or 2292.2, as modified by the following:

The fuel specification for 2292.1 shall be modified to: a) require methanol content at 98.0 ± 0.5 volume percent; b) require ethanol content at 1.0 ± 0.1 volume percent; c) require certification gasoline as noted in paragraph 9(a) of the California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles at 1.0 ± 1.0 volume percent.

The specification for 2292.2 shall be modified to require certification gasoline as noted in paragraph 9(a) of the California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles, as the hydrocarbon fraction. The vapor pressure specification for the emission-testing fuel shall be adjusted to 8.0-8.5 psi, using common blending components from the gasoline stream.

(b)(4)(iii) Fuel additives and ignition improvers intended for use in methanol test fuels shall be subject to the approval of the Executive Officer. In order for such approval to

be granted, a manufacturer must demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

* * * * *

ADD SUBPARAGRAPH (e) TO READ:

(e) Natural Gas and Liquefied Petroleum Gas Test Fuel.

(e)(1) Natural Gas Test Fuel.

(e)(1)(i) Natural gas used in service accumulation for 1990 through 1993 model-year diesel engines shall be representative of commercial natural gas which is generally available. Natural gas meeting the specifications below, or substantially equivalent specifications approved by the Executive Officer, shall be used in exhaust emission testing for 1990 through 1993 model-year diesel engines. The specifications set forth in subparagraph (e)(1)(ii) may be used as an option for 1993 model-year engines.

Natural Gas Emission Test Fuel Specification

<u>Specification</u>	<u>Value</u>	<u>Tolerance</u>	<u>Calculation Method</u>
Wobbe Number	1350	± 0.5%	ASTM D 1945 Using AGA Bulletin No. 36

Hydrocarbons (expressed as percent of total organic carbon present)

Methane	88%	± 0.5%	ASTM D 1945
Ethane	8%	± 0.3%	ASTM D 1945
C ₃ and higher HC	4%	± 0.2%	ASTM D 1945
C ₆ and higher HC	0.5%	maximum	ASTM D 1945
Total unsaturated HC	0.5%	maximum	ASTM D 2650

Other Species (expressed as mole percent)

Hydrogen	0.1%	maximum	ASTM D 2650
Carbon Monoxide	0.1%	maximum	ASTM D 2650

Other Requirements

1. Free from liquids over the entire range of temperatures and pressures encountered in the engine and fuel system.
2. Free from solid particulate matter.

(e)(1)(ii) Natural gas used in service accumulation and in exhaust emission testing for 1994 and subsequent model-year engines shall meet the specifications as follows:

Mileage accumulation fuel: Natural gas meeting the specification listed in Title 13, CCR, Section 2292.5 shall be used in service accumulation.

Emission-test fuel: Natural gas meeting specifications listed in Title 13, CCR, Section 2292.5 as modified by the following: a) methane content at 90.0 ± 1.0 mole percent; b) ethane content at 4.0 ± 0.5 mole percent; c) C_3 and higher hydrocarbon content at 2.0 ± 0.3 mole percent; d) oxygen content at 0.5 mole percent maximum; e) inert gas (sum of CO_2 and N_2) content at 3.5 ± 0.5 mole percent.

(e)(2)(i) Liquefied Petroleum Gas Test Fuel. Liquefied petroleum gas used in service accumulation for 1990 through 1993 model-year diesel engines shall be representative of commercial liquefied petroleum gas which is generally available through retail outlets. Liquefied petroleum gas used in exhaust and evaporative emission testing for 1990 through 1993 model-year diesel engines shall conform to NGPA HD-5 specification. The specifications set forth in subparagraph (e)(1)(ii) may be used as an option for 1993 model-year engines.

(e)(2)(ii) Liquefied petroleum gas used in service accumulation and in exhaust and evaporative emission testing for 1994 and subsequent model-year diesel engines shall meet the specifications as follows:

Mileage accumulation fuel: Liquefied petroleum gas meeting the specifications listed in Title 13, CCR, Section 2292.6 shall be used in service accumulation.

Emission-test fuel: Liquefied petroleum gas meeting the specifications listed in Title 13, CCR, Section 2292.6 shall be used for exhaust and evaporative emission testing with the following exceptions: a) propane content limited to 93.5 ± 1.0 volume percent; b) propene content limited to 3.8 ± 0.5 volume percent; and c) butane and heavier components limited to 1.9 ± 0.3 volume percent.

(e)(3) The specification range of the fuels to be used under paragraphs (e)(1) and (e)(2) of this section shall be reported in accordance with 86.090-21(b)(3).

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Amend Additional Requirements, California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles to read:

Additional Requirements

1. Any reference to vehicle or engine sales or vehicle or engine production volume throughout the United States shall mean vehicle or engine sales or vehicle or engine production volume in each the United States and California.
2. Regulations concerning EPA hearings, EPA inspections, and specific language on the Certificate of Conformity, shall not be applicable to these procedures.
3. Any reference made to Selective Enforcement Auditing (SEA) shall not be applicable to these procedures.
4. Methanol-fueled engines and vehicles shall comply with the "California Evaporative Emission Standards and Test Procedures for 1978 and Subsequent Model Liquefied Petroleum Gas- or Gasoline- or Methanol-Fueled Motor Vehicles," as incorporated in Title 13, California Code of Regulations, Section 1976.
5. In addition to the standards and provisions specified in CFR Section 86.091-11 and 86.094-11 (emission standards for diesel-fuel and diesel methanol heavy-duty engines and vehicles), the following formaldehyde emission levels as measured under transient operating conditions shall not be exceeded for methanol-fueled engines and vehicles:

Model Year	Formaldehyde (g/bhp-hr)
1993-1995	0.10
1996 and Subsequent	0.05

The following formaldehyde emission levels as measured under transient operating conditions shall not be exceeded for 1992 and subsequent low-emission and ultra-low-emission vehicles and engines used in low-emission and ultra-low-emission vehicles operating on any fuel.

Model Year	Formaldehyde (g/bhp-hr)
1992 and Subsequent Low-Emission Vehicles and Engines	0.050
1992 and Subsequent Ultra-Low- Emission Vehicles and Engines	0.025

6. All dedicated gaseous-fuel, dual-fuel, and multi-fuel diesel engines (and vehicles), including those engines derived from existing diesel engines shall comply with the requirements which are applicable to heavy-duty diesel engines, except where otherwise noted.
7. Prior to the 2004 model year, non-methane ~~Non-methane~~ hydrocarbon emissions shall be measured in accordance with the "California Non-Methane Hydrocarbon Test Procedures," as last amended July 12, 1991, which is incorporated herein by reference.