measured in accordance with those procedures.

(B) For vehicles with a Gross Vehicle Weight Rating greater than 26,000 pounds, the standards set forth in paragraphs (b)(3)(i) and (b)(4)(ii) of this section refer to the manufacturer’s engineering design evaluation using good engineering practice (a statement of which is required in §86.091–23(b)(4)(ii)).

(iv) Compressed natural gas vehicles must meet the requirements for fueling connection devices as specified in §86.1813–17(f)(1). Vehicles meeting these requirements are deemed to comply with evaporative emission standards.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 2004 or later model year methanol-, natural gas-, or liquefied petroleum gas-fueled diesel, or any naturally-aspirated diesel HDE. For petroleum-fueled engines only, this provision does not apply to engines using turbochargers, pumps, blowers, or superchargers for air induction.

(d) Every manufacturer of new motor vehicle engines subject to the standards prescribed in this section shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with applicable procedures in subpart I or N of this part to ascertain that such test engines meet the requirements of this section.

(e) The standards described in this section do not apply to diesel-fueled medium-duty passenger vehicles (MDPVs) that are subject to regulation under subpart S of this part, except as specified in subpart S of this part. The standards described in this section also do not apply to diesel engines used in such MDPVs, except as specified in the regulations in subpart S of this part. The term “medium-duty passenger vehicle” is defined in §86.1803.

§86.004–15 NO\textsubscript{X} plus NMHC and particulate averaging, trading, and banking for heavy-duty engines.

(a)(1) Heavy-duty engines eligible for NO\textsubscript{X} plus NMHC and particulate averaging, trading and banking programs are described in the applicable emission standards sections in this subpart. 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. For manufacturers not selecting Options 1 or 2 contained in §86.005–10(f), the ABT program requirements contained in §86.000–15 apply for 2004 model year Otto-cycle engines, rather than the provisions contained in this §86.004–15. Participation in these programs is voluntary.

(2)(i) Engine families with FELs exceeding the applicable standard shall obtain emission credits in a mass amount sufficient to address the shortfall. Credits may be obtained from averaging, trading, or banking, within the averaging set restrictions described in this section.

(ii) Engine families with FELs below the applicable standard will have emission credits available to average, trade, or a combination thereof. Credits may not be used for averaging or trading to offset emissions that exceed an FEL. Credits may not be used to remedy an in-use nonconformity determined by a Selective Enforcement Audit or by recall testing. However, credits may be used to allow subsequent production of engines for the family in question if the manufacturer elects to recertify to a higher FEL.

(b) Participation in the NO\textsubscript{X} plus NMHC and/or particulate averaging, trading, and banking programs shall be done as follows:

(i) During certification, the manufacturer shall:

(I) Declare its intent to include specific engine families in the averaging, trading and/or banking programs. Separate declarations are required for each program and for each pollutant (i.e., NO\textsubscript{X} plus NMHC, and particulate).

(ii) Declare an FEL for each engine family participating in one or more of these two 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 NO\textsubscript{X} plus NMHC emissions and one-hundredth of a gram per brake horsepower-hour for particulate emissions).
§ 86.004–15  40 CFR Ch. I (7–1–14 Edition)

(B) In no case may the FEL exceed the upper limit prescribed in the section concerning the applicable heavy-duty engine NO\textsubscript{X} plus NMHC and particulate emission standards.

(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 paragraph (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.

(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 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. 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\textsubscript{X}, NO\textsubscript{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.

(6) If EPA or the manufacturer determines that a reporting error occurred on an end-of-year report previously submitted to EPA 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 for retroactive use.

(i) If EPA 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 of 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. EPA 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 review determines a reporting error in the manufacturer's favor (i.e., resulting in a positive credit balance) or if the manufacturer discovers such
Environmental Protection Agency

§ 86.004–15

an error within 180 days of EPA receipt of the end-of-year report, the credits will be restored for use by the manufacturer.

(c)(1) For each participating engine family, NO\textsubscript{X} plus NMHC, and particulate emission credits (positive or negative) are to be calculated according to one of the following equations and rounded, in accordance with ASTM E229-93a. (incorporated by reference at §86.1), to the nearest one-tenth of a Megagram (Mg). Consistent units are to be used throughout the equation.

(i) For determining credit need for all engine families and credit availability for engine families generating credits for averaging programs only:

\[ \text{Emission credits} = (\text{Std} - \text{FEL}) \times (\text{CF}) \times (\text{UL}) \times (\text{Production}) \times (10^{-6}) \]

(ii) For determining credit availability for engine families generating credits for trading or banking programs:

\[ \text{Emission credits} = (\text{Std} - \text{FEL}) \times (\text{CF}) \times (\text{UL}) \times (\text{Production}) \times (10^{-6}) \times (\text{Discount}) \]

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

\text{Std} = the current and applicable heavy-duty engine NO\textsubscript{X} plus NMHC or particulate emission standard in grams per brake horsepower hour or grams per Megajoule.

\text{FEL} = the NO\textsubscript{X} plus NMHC, or particulate family emission limit for the engine family in grams per brake horsepower hour or grams per Megajoule.

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

\text{UL} = the useful life described in §86.004-2, or alternative life as described in §86.004-21(f), for the given engine family in miles.

\text{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.

\text{Discount} = a one-time discount applied to all credits to be banked or traded within the model year generated. Except as otherwise allowed in paragraphs (k) and (l) of this section, the discount applied here is 0.9. 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.

(2)(i) The transient cycle conversion factor is the total (integrated) cycle brake horsepower-hour or Megajoules, divided by the equivalent mileage of the applicable transient cycle. For Otto-cycle heavy-duty engines, the equivalent mileage is 6.3 miles. For diesel heavy-duty engines, the equivalent mileage is 6.5 miles.

(ii) When more than one configuration is chosen by EPA 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) Averaging sets for NO\textsubscript{X} plus NMHC emission credits. The averaging and trading of NO\textsubscript{X} plus NMHC emission credits will only be allowed between heavy-duty engine families in the same averaging set. The averaging sets for the averaging and trading of NO\textsubscript{X} plus NMHC emission credits for heavy-duty engines are defined as follows:

(1) For NO\textsubscript{X}+NMHC credits from Otto-cycle heavy-duty engines:

(i) Otto-cycle heavy-duty engines constitute an averaging set. Averaging and trading among all Otto-cycle heavy-duty engine families is allowed. There are no subclass restrictions.

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

(2) For NO\textsubscript{X} 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.

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

(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 in the same
averaging set. 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 §86.004–2, 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.

(f) Banking of NO\textsubscript{X} plus NMHC, and particulate emission credits—(1) Credit deposits.

(i) NO\textsubscript{X} plus NMHC, and particulate emission credits may be banked from engine families produced in any model year.

(ii) Manufacturers may bank credits only after the end of the model year and after actual credits have been reported to EPA 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.

(2) Credit withdrawals. (i) NO\textsubscript{X} credits banked in accordance with §86.000–15 may not be used to meet the Otto-cycle engine standards contained in §86.005–10.

(g) This paragraph (g) assumes NO\textsubscript{X} plus NMHC, and particulate non-conformance penalties (NCPs) will be available for the 2004 and later model year HDEs.

(2) Engine families using NO\textsubscript{X} plus NMHC and/or particulate NCPs but not involved in averaging:

(i) May not generate NO\textsubscript{X} plus NMHC or particulate credits from banking and trading.

(ii) May not use NO\textsubscript{X} plus NMHC or particulate credits from banking and trading.

(3) If a manufacturer has any engine family to which application of NCPs and banking and trading credits is desired, that family must be separated into two distinct families. One family, whose FEL equals the standard, must use credits only.
Environmental Protection Agency

§ 86.004–15

(4) If a manufacturer has any engine family in a given averaging set which is using NO\textsubscript{X} plus NMHC and/or particulate NCPs, none of that manufacturer's engine families in that averaging set may generate credits for banking and trading.

(b) In the event of a negative credit balance in a trading situation, both the buyer and the seller would be liable.

(i) Certification fuel used for credit generation must be of a type that is both available in use and expected to be used by the engine purchaser. Therefore, upon request by the Administrator, the engine manufacturer must provide information acceptable to the Administrator that the designated fuel is readily available commercially and would be used in customer service.

(j) Credit apportionment. At the manufacturer's option, 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.

(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 §86.005–10 or §86.004–11. For each engine family, the manufacturer may report engine sales in two categories, "ABT-only credits" and "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 (c)(1) of this section, 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 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 §86.001–23.

(k) Additional flexibility for diesel-cycle engines. If a diesel-cycle engine family meets the conditions of either paragraph (k)(1) or (2) of this section, a Discount of 1.0 may be used in the trading and banking calculation, for both NO\textsubscript{X} plus NMHC and for particulate, described in paragraph (c)(1) of this section.

(1) The engine family certifies with a certification level of 1.9 g/bhp-hr NO\textsubscript{X} plus NMHC or lower for all diesel-cycle engine families.

(2) All of the following must apply to the engine family:

(i) Diesel-cycle engines only;

(ii) 2004, 2005, and 2006 model years only;

(iii) Must be an engine family using carry-over certification data from prior to model year 2004 where the NO\textsubscript{X} plus the HC certification level prior to model year 2004 is below the NO\textsubscript{X} plus NMHC or NO\textsubscript{X} plus NMHCE standard set forth in §86.004–11. Under this option, the NO\textsubscript{X} credits generated from this engine family prior to model year 2004 may be used as NO\textsubscript{X} plus NMHC credits.

(l) Additional flexibility for Otto-cycle engines. If an Otto-cycle engine family meets the conditions of paragraph (l)(1) or (2) of this section, a discount of 1.0 may be used in the trading and banking credits calculation for NO\textsubscript{X} plus NMHC described in paragraph (c)(1) of this section, as follows:

(1) The engine family has a FEL of 0.5 g/bhp-hr NO\textsubscript{X} plus NMHC or lower:

(2) All of the following conditions are met:
§ 86.004–16 Prohibition of defeat devices.

(a) No new heavy-duty vehicle or heavy-duty engine shall be equipped with a defeat device.

(b) The Administrator may test or require testing on any vehicle or engine at a designated location, using driving cycles and conditions which may reasonably be expected to be encountered in normal operation and use, for the purpose of investigating a potential defeat device.

(c) [Reserved]

(d) For vehicle and engine designs designated by the Administrator to be investigated for possible defeat devices:

(1) General. The manufacturer must show to the satisfaction of the Administrator that the vehicle or engine design does not incorporate strategies that reduce emission control effectiveness exhibited during the applicable Federal emissions test procedures when the vehicle or engine is operated under conditions which may reasonably be expected to be encountered in normal operation and use, for the purpose of investigating a potential defeat device.

(c) [Reserved]

(d) For vehicle and engine designs designated by the Administrator to be investigated for possible defeat devices:

(1) General. The manufacturer must show to the satisfaction of the Administrator that the vehicle or engine design does not incorporate strategies that reduce emission control effectiveness exhibited during the applicable Federal emissions test procedures when the vehicle or engine is operated under conditions which may reasonably be expected to be encountered in normal operation and use, for the purpose of investigating a potential defeat device.

(ii) NO\textsubscript{X} and NO\textsubscript{X} plus NMHC averaging. (A) If the manufacturer elects to participate in the NO\textsubscript{X} averaging program for diesel light-duty trucks or the NO\textsubscript{X} plus NMHC averaging program for diesel-cycle HDEs, the application must list the family emission limit and the projected U.S. production volume for the model year.

(B) The manufacturer shall choose the level of the family particulate emission limits, accurate to one hundredth of a gram per mile or hundredth of a gram per brake horsepower hour for HDEs.

(C) The manufacturer may at any time during production elect to change the level of any family particulate emission limit(s) by submitting the new limit(s) to the Administrator and by demonstrating compliance with the limit(s) as described in §§86.090–2 and 86.094–28(b)(5)(i).

(ii) NO\textsubscript{X} and NO\textsubscript{X} plus NMHC averaging. (A) If the manufacturer elects to participate in the NO\textsubscript{X} averaging program for light-duty trucks or the NO\textsubscript{X} plus NMHC averaging program for diesel-cycle HDEs, the application must list the family emission limit and the projected U.S. production volume for the model year.

(B) The manufacturer shall choose the level of the family particulate emission limits, accurate to one-tenth of a gram per