this section and the requirements of this section.

(g) *Notification of Completion.* The party shall notify EPA in writing within thirty (30) days of completion of the R&D program.

§ 80.601 What requirements apply to motor vehicle diesel fuel for use in the Territories?

The sulfur standards of § 80.520(a)(1) and (c) do not apply to diesel fuel that is produced, imported, sold, offered for sale, supplied, offered for supply, stored, dispensed, or transported for use in the Territories of Guam, American Samoa or the Commonwealth of the Northern Mariana Islands provided that such diesel fuel is:

(a) Designated by the refiner or importer as high sulfur diesel fuel only for use in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands;

(b) Used only in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands;

(c) Accompanied by documentation that complies with the product transfer document requirements of § 80.590(e)(3); and

(d) Segregated from non-exempt motor vehicle diesel fuel at all points in the distribution system from the point the diesel fuel is designated as exempt fuel only for use in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands, while the exempt fuel is in the United States but outside these Territories.

§ 80.602 What exemption applies to diesel fuel used in vehicles having a national security exemption from motor vehicle emissions standards?

The motor vehicle diesel fuel standards of § 80.520(a)(1), (a)(2), and (c) do not apply to diesel fuel that is produced, imported, sold, offered for sale, supplied, offered for supply, stored, dispensed, or transported for use in:

(a) Vehicles for which EPA has granted a national security exemption under 40 CFR 85.1708 from motor vehicle emissions standards under 40 CFR Part 86; or

(b) Tactical military motor vehicles that are not subject to a national security exemption from motor vehicle emissions standards but for national security purposes (for purposes of readiness for deployment oversees) need to be fueled on the same fuel as motor vehicles for which EPA has granted a national security exemption, provided that such fuel is:

(1) Used only in vehicles identified in paragraph (a) of this section or this paragraph (b);

(2) Accompanied by product transfer documents as required under § 80.590;

(3) Segregated from non-exempt motor vehicle diesel fuel at all points in the distribution system; and

(4) Dispensed from a fuel pump stand, fueling truck or tank that is labeled under the provisions of § 80.570(c). Any such fuel pump stand, fueling truck or tank may also be labeled with the appropriate designation of the fuel, such as ''JP–8''.

§ 80.603–80.609 [Reserved]

Violation Provisions

§ 80.610 What acts are prohibited under the diesel fuel sulfur program?

No person shall:

(a) *Standard or dye violation.* Produce, import, sell, offer for sale, dispense, supply, offer for supply, store or transport motor vehicle diesel fuel that does not comply with the applicable standards and dye requirements under § 80.520.

(b) *Additive violation.* (1) Produce, import, sell, offer for sale, dispense, supply, offer for supply, store or transport any motor vehicle diesel fuel additive for use at a downstream location that does not comply with the requirements under § 80.521(a) or (b), as applicable.

(2) Blend or permit the blending into motor vehicle diesel fuel at a downstream location, or use, or permit the use, as motor vehicle diesel fuel, of any additive which does not comply with the requirements of § 80.521(a) or (b), as applicable.

(c) *Used motor oil violation.* Introduce into the fuel system of model year 2007 or later diesel motor vehicles, or permit the introduction into the fuel system of such vehicles of used motor oil, or used motor oil blended with diesel fuel, which does not comply with the requirements of § 80.522.

(d) *Improper fuel usage violation.* (1) Introduce, or permit the introduction of, diesel fuel into model year 2007 or later diesel motor vehicles, and beginning December 1, 2010 into any diesel motor vehicle, which does not comply with the standards and dye requirements of § 80.520(a) and (b).

(2) Produce, import, sell, offer for sale, dispense, offer for supply, store, or transport for use in model year 2007 or later diesel motor vehicles, or introduce or permit the introduction into such motor vehicles, motor vehicle diesel fuel that is identified as other than diesel fuel complying with the 15 ppm sulfur standard; and beginning December 1, 2010, diesel fuel for use in or introduced into any diesel motor vehicle.

(e) *Cause another party to violate.* Cause another person to commit an act in violation of paragraphs (a) through (d) of this section.

(f) *Cause violating fuel or additive to be in the distribution system.* Cause motor vehicle diesel fuel to be in the motor vehicle diesel fuel distribution system which does not comply with the applicable standard and dye requirements of § 80.520(a) and (b), or cause any motor vehicle diesel fuel additive to be in the motor vehicle diesel fuel additive distribution system which does not comply with the applicable sulfur, cetane, and/or aromatics standards of § 80.521.

§ 80.611 What evidence may be used to determine compliance with the prohibitions and requirements of this subpart and liability for violations of this subpart?

(a) *Compliance with sulfur, cetane, and aromatics standards.* Compliance with the standards in §§ 80.520, 80.521, and 80.522 shall be determined based on the level of the applicable component or parameter, using the sampling methodologies specified in § 80.330(b), as applicable, and the appropriate testing methodologies specified in § 80.580(a)(2) for sulfur, or one of the alternative methodologies for sulfur as approved under § 80.580(a)(3); § 80.2(w) for cetane index; and § 80.2(z) for aromatic content. Any evidence or information, including the exclusive use of such evidence or information, may be used to establish the level of the applicable component or parameter in the diesel fuel or additive, or motor oil to be used in diesel fuel, if the evidence or information is relevant to whether that level would have been in compliance with the standard if the regulatory sampling and testing methodology had been correctly performed. Such evidence may be obtained from any source or location and may include, but is not limited to, test results using methods other than the compliance methods in this paragraph (a), business records, and commercial documents.

(b) *Compliance with other requirements.* Determination of compliance with the requirements of this subpart other than the standards described in paragraph (a) of this section and in §§ 80.520, 80.521, and 80.522, and determination of liability for any violation of this subpart, may be based on information obtained from any source or location. Such information may include, but is not limited to, business records and commercial documents.

§ 80.612 Who is liable for violations of this subpart?

(a) *Persons liable for violations of prohibited acts.*—(1) *Standard, dye, additives, motor oil, and introduction violations.* (i) Any refiner, importer, distributor, reseller, carrier, retailer, or wholesale purchaser-consumer who owned, leased, operated, controlled or supervised a facility where a violation of § 80.610(a) through (d) occurred, or any other person who violates § 80.610(a) through (d), is deemed liable for the applicable violation.

(ii) Any person who causes another person to violate § 80.610(a) through (d) is liable for a violation of § 80.610(e).

(iii) Any refiner, importer, distributor, reseller, carrier, retailer, or wholesale purchaser-consumer who produced, imported, sold, offered for sale, dispensed, supplied, offered to supply, stored, transported, or caused the transportation or storage of, motor vehicle diesel fuel that violates § 80.610(a), is deemed in violation of § 80.610(e).

(iv) Any person who produced, imported, sold, offered for sale, dispensed, supplied, offered to supply, stored, transported, or caused the transportation or storage of a motor vehicle diesel fuel additive which is used in motor vehicle diesel fuel that is found to violate § 80.610(a), is deemed in violation of § 80.610(e).

(2) *Cause violating motor vehicle diesel fuel or additive to be in the distribution system.* Any refiner, importer, distributor, reseller, carrier, retailer, or wholesale purchaser-consumer or any other person who owned, leased, operated, controlled or supervised a facility from which motor vehicle diesel fuel or additive was released into the motor vehicle diesel fuel or additive distribution system which does not comply with the applicable standards or dye requirements of § 80.520 or § 80.521, is deemed in violation of § 80.610(f).

(3) *Branded refiner/importer liability.* Any refiner or importer whose corporate, trade, or brand name, or whose marketing subsidiary's corporate, trade, or brand name appeared at a facility where a violation of § 80.610(a) occurred, is deemed in violation of § 80.610(a).

(4) *Carrier causation.* In order for a motor vehicle diesel fuel or motor vehicle diesel fuel additive carrier to be liable under paragraph (a)(1)(ii), (iii) or (iv) of this section, as applicable, EPA must demonstrate, by reasonably specific showing by direct or circumstantial evidence, that the carrier caused the violation.

(5) *Parent corporation.* Any parent corporation is liable for any violations of this subpart that are committed by any subsidiary.

(6) *Joint venture.* Each partner to a joint venture is jointly and severally liable for any violation of this subpart that occurs at the joint venture facility or is committed by the joint venture operation.

(b) *Persons liable for failure to comply with other provisions ofthis subpart.* Any person who:

(1) Fails to comply with the requirements of a provision of this subpart not addressed in paragraph (a) of this section is liable for a violation of that provision; or

(2) Causes another person to fail to comply with the requirements of a provision of this subpart not addressed in paragraph (a) of this section, is liable for causing a violation of that provision.

§ 80.613 What defenses apply to persons deemed liable for a violation of a prohibited act?

(a) *Presumptive liability defenses.* (1) Any person deemed liable for a violation of a prohibition under § 80.612(a)(1)(i) or (iii), (a)(2), or (a)(3), will not be deemed in violation if the person demonstrates:

(i) The violation was not caused by the person or the person's employee or agent;

(ii) Product transfer documents account for fuel or additive found to be in violation and indicate that the violating product was in compliance with the applicable requirements when it was under the party's control;

(iii) The person conducted a quality assurance sampling and testing program, as described in paragraph (d) of this section, except for those parties subject to the provisions of paragraph (a)(1)(iv) or (v) of this section. A carrier may rely on the quality assurance program carried out by another party, including the party who owns the diesel fuel in question, provided that the quality assurance program is carried out properly. Retailers, wholesale purchaser-consumers, and ultimate consumers of diesel fuel are not required to conduct quality assurance programs;

(iv) For refiners and importers of motor vehicle diesel fuel subject to the 15 ppm standard under § 80.520(a)(1), test results which:

(A) Were conducted according to the test methodology required under § 80.580 (a)(2) or an approved alternative test method under § 80.580(a)(3); and

(B) Establish that, when it left the party's control, the sulfur content of motor vehicle diesel fuel subject to the 15 ppm standard did not exceed 15 ppm; and

(v) For any person who, at a downstream location, blends a diesel fuel additive subject to the requirements of § 80.521(b) into motor vehicle diesel fuel subject to the sulfur standard under § 80.520(a)(1), except a blender who blends additives into fuel trucks at a truck loading rack subject to the provisions of (d)(1) of this section, test results which are conducted subsequent to the blending of the additive into the fuel, and which comply with the requirements of paragraphs (a)(4)(iv)(A) and (B) of this section.

(2) Any party deemed liable for a violation under § 80.612(a)(1)(iv), in regard to a diesel fuel additive subject to the requirements of § 80.521(a), will not be deemed in violation if the person demonstrates that:

(i) Product transfer document(s) account for the additive in the fuel found to be in violation, which comply with the requirements under § 80.591(a), and indicate that the additive was in compliance with the applicable requirements while it was under the party's control; and

(ii) For the additive's manufacturer or importer, test results which accurately establish that, when it left the party's control, the additive in the diesel fuel determined to be in violation did not have a sulfur content in excess of 15 ppm.

(A) Analysis of the additive sulfur content pursuant to this paragraph (a)(2) may be conducted at the time the batch was manufactured or imported, or on a sample of that batch which the manufacturer or importer retains for such purpose for a minimum of two years from the date the batch was manufactured or imported.

(B) After two years from the date the additive batch was manufactured or imported, the additive manufacturer or importer is no longer required to retain samples for the purpose of complying with the testing requirements of this paragraph (a)(2) of this section.

(C) The analysis of the sulfur content of the additive must be conducted pursuant to the requirements of § 80.580(a).

(3) Any person who is deemed liable for a violation under § 80.612 (a)(1)(iv) with regard to a diesel fuel additive subject to the requirements of § 80.521(b), will not be deemed in violation if the person demonstrates that:

(i) The violation was not caused by the party or the party's employee or agent;

(ii) Product transfer document(s) which comply with the additive information requirements under § 80.591 (b), account for the additive in the fuel found to be in violation, and indicate that the additive was in compliance with the applicable requirements while it was under the party's control; and

(iii) For the additive's manufacturer or importer, test results which accurately establish that, when it left the party's control, the additive in the diesel fuel determined to be in violation was in conformity with the information on the additive product transfer document pursuant to the requirements of § 80.591(b). The testing procedures applicable under paragraph (a)(2) of this section, also apply under this paragraph (a)(3).

(b) *Branded refiner defenses.* In the case of a violation found at a facility operating under the corporate, trade or brand name of a refiner or importer, or a refiner's or importer's marketing subsidiary, the refiner or importer must show, in addition to the defense elements required under paragraph (a)(1) of this section, that the violation was caused by:

(1) An act in violation of law (other than the Clean Air Act or this Part 80), or an act of sabotage or vandalism;

(2) The action of any refiner, importer, retailer, distributor, reseller, oxygenate blender, carrier, retailer or wholesale purchaser-consumer in violation of a contractual agreement between the branded refiner or importer and the person designed to prevent such action, and despite periodic sampling and testing by the branded refiner or importer to ensure compliance with such contractual obligation; or

(3) The action of any carrier or other distributor not subject to a contract with the refiner or importer, but engaged for transportation of diesel fuel, despite specifications or inspections of procedures and equipment which are reasonably calculated to prevent such action.

(c) *Causation demonstration.* Under paragraph (a)(1) of this section for any person to show that a violation was not caused by that person, or under paragraph (b) of this section to show that a violation was caused by any of the specified actions, the person must demonstrate by reasonably specific showing, by direct or circumstantial evidence, that the violation was caused or must have been caused by another person and that the person asserting the defense did not contribute to that other person's causation.

(d) *Quality assurance and testing program.* To demonstrate an acceptable quality assurance program under paragraph (a)(1)(iii) of this section, a person must present evidence of the following:

(1) A periodic sampling and testing program to ensure the motor vehicle diesel fuel or additive the person sold, dispensed, supplied, stored, or transported, meets the applicable standards.

(2) For those parties who, at a downstream location, blend diesel fuel additives subject to the requirements of § 80.521(b) into fuel trucks at a truck loading rack, the periodic sampling and testing program required under this paragraph (d) must ensure, by taking into account the greater risk of noncompliance created through use of a high sulfur additive, that the diesel fuel into which the additive was blended meets the applicable standards subsequent to the blending.

(3) On each occasion when motor vehicle diesel fuel or additive is found not in compliance with the applicable standard:

(i) The person immediately ceases selling, offering for sale, dispensing, supplying, offering for supply, storing or transporting the non-complying product; and

(ii) The person promptly remedies the violation and the factors that caused the violation (for example, by removing the non-complying product from the distribution system until the applicable standard is achieved and taking steps to prevent future violations of a similar nature from occurring).

(4) For any carrier who transports motor vehicle diesel fuel or additive in a tank truck, the quality assurance program required under this paragraph (d) need not include its own periodic sampling and testing of the motor vehicle diesel fuel or additive in the tank truck, but in lieu of such tank truck sampling and testing, the carrier shall demonstrate evidence of an oversight program for monitoring compliance with the requirements of this subpart relating to the transport or storage of such product by tank truck, such as appropriate guidance to drivers regarding compliance with the applicable sulfur standard and product transfer document requirements, and the periodic review of records received in the ordinary course of business concerning motor vehicle diesel fuel or additive quality and delivery.

§ 80.614 What penalties apply under this subpart?

(a) Any person liable for a violation under § 80.612 is subject to civil penalties as specified in section 205 of the Clean Air Act for every day of each such violation and the amount of economic benefit or savings resulting from each violation.

(b)(1) Any person liable under § 80.612(a)(1) for a violation of an applicable standard or requirement under § 80.520, or of causing another party to violate such standard or requirement, is subject to a separate day of violation for each and every day the non-complying motor vehicle diesel fuel remains any place in the distribution system.

(2) Any person liable under § 80.612(a)(2) for causing motor vehicle diesel fuel to be in the distribution system which does not comply with an applicable standard or requirement of § 80.520, is subject to a separate day of violation for each and every day that the non-complying motor vehicle diesel fuel remains any place in the motor vehicle diesel fuel distribution system.

(3) Any person liable under § 80.612(a)(1) for blending into motor vehicle diesel fuel an additive violating the applicable sulfur standard pursuant to the requirements of § 80.521(a) or (b), as appropriate, or of causing another party to so blend or add such an additive, is subject to a separate day of violation for each and every day the motor vehicle diesel fuel into which the noncomplying additive was blended, remains any place in the fuel distribution system.

(4) For purposes of this paragraph (b), the length of time the motor vehicle diesel fuel in question remained in the motor vehicle diesel fuel distribution system is deemed to be twenty-five days, unless a person subject to liability or EPA demonstrates by reasonably specific showings, by direct or circumstantial evidence, that the non-complying motor vehicle diesel fuel remained in the distribution system for fewer than or more than twenty-five days.

(c) Any person liable under § 80.612(b) for failure to meet, or causing a failure to meet, a provision of this subpart is liable for a separate day of violation for each and every day such provision remains unfulfilled.

§§ 80.615–80.619 [Reserved]

Provisions for Foreign Refiners and Importers for Motor Vehicle Diesel Fuel Subject to a Temporary Compliance Option or Hardship Provision

§ 80.620 What are the additional requirements for motor vehicle diesel fuel produced by foreign refineries subject to a temporary refiner compliance option or hardship provisions?

(a) *Definitions.* (1) A foreign refinery is a refinery that is located outside the

United States, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands (collectively referred to in this section as ''the United States'').

(2) A foreign refiner is a person who meets the definition of refiner under § 80.2(i) for a foreign refinery.

(3) A diesel fuel program foreign refiner (''DFR'') is a foreign refiner that has been approved by EPA for participation in any motor vehicle diesel fuel credits program, motor vehicle diesel fuel temporary compliance option, hardship or GPA provisions of §§ 80.530 through 80.532, § 80.540, § 80.552, § 80.553, § 80.560 or § 80.561 (collectively referred to as ''diesel foreign refiner program'').

(4) ''DFR-Diesel'' means motor vehicle diesel fuel produced at a DFR refinery that is imported into the United States.

(5) ''Non-DFR-Diesel'' means motor vehicle diesel fuel that is produced at a foreign refinery that has not been approved as a DFR foreign refiner, motor vehicle diesel fuel produced at a DFR foreign refinery that is not imported into the United States, and motor vehicle diesel fuel produced at a DFR foreign refinery during a period when the foreign refiner has opted to not participate in the DFR-Diesel diesel foreign refiner program under paragraph (c)(3) of this section.

(6) ''Certified DFR-Diesel'' means DFR-Diesel the foreign refiner intends to include in the foreign refinery's compliance calculations under §§ 80.530 through 80.532, § 80.540, § 80.552, § 80.553, § 80.560 or § 80.561 and does include in these compliance calculations when reported to EPA.

(7) ''Non-Certified DFR-Diesel'' means DFR-Diesel fuel that a DFR foreign refiner imports to the United States that is not Certified DFR-Diesel.

(b) *Baseline.* For any foreign refiner to obtain approval under the diesel foreign refiner program of this subpart for any refinery, it must apply for approval under the applicable provisions of this subpart. To obtain approval the refiner is required, as applicable, to demonstrate a volume baseline for calendar years 1998 and 1999 for motor vehicle diesel fuel produced for use in the United States under §§ 80.595 and 80.596.

(1) The refiner shall follow the procedures, applicable to volume baselines and using motor vehicle diesel fuel instead of gasoline, in §§ 80.91 through 80.93 to establish the volume of motor vehicle diesel fuel that was produced at the refinery and imported into the United States during 1998 and 1999 for purposes of establishing a baseline under §§ 80.595 and 80.596.

(2) In making determinations for foreign refinery baselines EPA will consider all information supplied by a foreign refiner, and in addition may rely on any and all appropriate assumptions necessary to make such determinations.

(3) Where a foreign refiner submits a petition that is incomplete or inadequate to establish an accurate baseline, and the refiner fails to correct this deficiency after a request for more information, EPA will not assign an individual refinery motor vehicle diesel fuel volume baseline.

(c) *General requirements for DFR foreign refiners.* A foreign refiner of a refinery that is approved under the diesel foreign refiner program of this subpart must designate each batch of motor vehicle diesel fuel produced at the foreign refinery that is exported to the United States as either Certified DFR-Diesel or as Non-Certified DFR-Diesel, except as provided in paragraph (c)(3) of this section. It must further designate all Certified DFR-Diesel as complying with either the 15 ppm sulfur standard under § 80.520(a)(1) or the 500 ppm sulfur standard under § 80.520(c).

(1) In the case of Certified DFR-Diesel, the foreign refiner must meet all requirements that apply to refiners under this subpart, except that:

(i) For purposes of complying with the compliance option requirements of § 80.530, motor vehicle diesel fuel produced by a foreign refinery must comply separately for each Credit Trading Area of import, as defined in § 80.531(a)(5).

(ii) For purposes of complying with the compliance option requirements of § 80.530, credits obtained from any other refinery or from any importer must have been generated in the same Credit Trading Area as the Credit Trading Area of import of the fuel for which credits are needed to achieve compliance.

(iii) For purposes of generating credits under this subpart, credits shall be generated separately by Credit Trading Area of import and shall be designated by Credit Trading Area of importation and by port of importation.

(2) In the case of Non-Certified DFR-Diesel, the foreign refiner shall meet all the following requirements:

(i) The designation requirements in this section.

(ii) The reporting requirements in this section and § 80.593.

(iii) The product transfer document requirements in this section.

(iv) The prohibitions in this section and § 80.610.

(3)(i) Any foreign refiner that has been approved to produce motor vehicle diesel fuel subject to the diesel foreign refiner program for a foreign refinery under this subpart may elect to classify no diesel fuel imported into the United States as DFR-Diesel provided the foreign refiner notifies EPA of the election no later than November 1 of the prior calendar year.

(ii) An election under paragraph (c)(3)(i) of this section shall be for an entire calendar year and apply to all motor vehicle diesel fuel that is produced by the foreign refinery that is imported into the United States, and shall remain in effect for each succeeding year unless and until the foreign refiner notifies EPA of the termination of the election. The change in election shall take effect at the beginning of the next calendar year.

(d) *Designation, product transfer documents, and foreign refiner certification.* (1) Any foreign refiner of a foreign refinery that has been approved by EPA to produce motor vehicle diesel fuel subject to the diesel foreign refiner program must designate each batch of DFR-Diesel as such at the time the diesel fuel is produced, unless the refiner has elected to classify no diesel fuel exported to the United States as DFR-Diesel under paragraph (c)(3) of this section.

(2) On each occasion when any person transfers custody or title to any DFR-Diesel prior to its being imported into the United States, it must include the following information as part of the product transfer document information in this section:

(i) Identification of the diesel fuel as Certified DFR-Diesel or as Non-Certified DFR-Diesel, and if it is Certified DFR-Diesel, further designation as meeting the 500 ppm sulfur standard under § 80.520(c) or the 15 ppm sulfur standard under § 80.520(a)(1) pursuant to § 80.523; and

(ii) The name and EPA refinery registration number (under § 80.593) of the refinery where the DFR-Diesel was produced.

(3) On each occasion when DFR-Diesel is loaded onto a vessel or other transportation mode for transport to the United States, the foreign refiner shall prepare a certification for each batch of the DFR-Diesel that meets the following requirements.

(i) The certification shall include the report of the independent third party under paragraph (f) of this section, and the following additional information:

(A) The name and EPA registration number of the refinery that produced the DFR-Diesel;

(B) The identification of the diesel fuel as Certified DFR-Diesel or Non-Certified DFR-Diesel;

(C) The volume of DFR-Diesel being transported, in gallons;

(D) In the case of Certified DFR-Diesel:

(*1*) The sulfur content as determined under paragraph (f) of this section, and the designation of the fuel as complying with the 15 ppm sulfur content standard for motor vehicle diesel fuel under § 80.520(a)(1) or the 500 ppm sulfur content standard for motor vehicle diesel fuel under § 80.520(c); and

(*2*) A declaration that the DFR-Diesel is being included in the applicable compliance calculations required by the EPA under this subpart.

(ii) The certification shall be made part of the product transfer documents for the DFR-Diesel.

(e) *Transfers of DFR-Diesel to non-United States markets.* The foreign refiner is responsible to ensure that all diesel fuel classified as DFR-Diesel is imported into the United States. A foreign refiner may remove the DFR-Diesel classification, and the diesel fuel need not be imported into the United States, but only if:

(1)(i) The foreign refiner excludes:

(A) The volume of diesel from the refinery's compliance report under § 80.593; and

(B) In the case of Certified DFR-Diesel, the volume of the diesel fuel from the compliance report under § 80.593.

(ii) The exclusions under paragraph (e)(1)(i) of this section shall be on the basis of the designations under § 80.523 and volumes determined under paragraph (f) of this section.

(2) The foreign refiner obtains sufficient evidence in the form of documentation that the diesel fuel was not imported into the United States.

(f) *Load port independent sampling, testing and refinery identification.* (1) On each occasion that DFR-Diesel is loaded onto a vessel for transport to the United States a foreign refiner shall have an independent third party:

(i) Inspect the vessel prior to loading and determine the volume of any tank bottoms;

(ii) Determine the volume of DFR-Diesel loaded onto the vessel (exclusive of any tank bottoms before loading);

(iii) Obtain the EPA-assigned registration number of the foreign refinery;

(iv) Determine the name and country of registration of the vessel used to transport the DFR-Diesel to the United States; and

(v) Determine the date and time the vessel departs the port serving the foreign refinery.

(2) On each occasion that Certified DFR-Diesel is loaded onto a vessel for transport to the United States a foreign refiner shall have an independent third party:

(i) Collect a representative sample of the Certified DFR-Diesel from each vessel compartment subsequent to loading on the vessel and prior to departure of the vessel from the port serving the foreign refinery;

(ii) Determine the sulfur content value for each compartment using the methodology specified in § 80.580 by:

(A) The third party analyzing each sample; or

(B) The third party observing the foreign refiner analyze the sample;

(iii) Review original documents that reflect movement and storage of the certified DFR-Diesel from the refinery to the load port, and from this review determine:

(A) The refinery at which the DFR-Diesel was produced; and

(B) That the DFR-Diesel remained segregated from:

(*1*) Non-DFR-Diesel and Non-Certified DFR-Diesel; and

(*2*) Other Certified DFR-Diesel produced at a different refinery.

(3) The independent third party shall submit a report:

(i) To the foreign refiner containing the information required under paragraphs (f)(1) and (f)(2) of this section, to accompany the product transfer documents for the vessel; and

(ii) To the Administrator containing the information required under paragraphs (f)(1) and (f)(2) of this section, within thirty days following the date of the independent third party's inspection. This report shall include a description of the method used to determine the identity of the refinery at which the diesel fuel was produced, assurance that the diesel fuel remained segregated as specified in paragraph (n)(1) of this section, and a description of the diesel fuel's movement and storage between production at the source refinery and vessel loading.

(4) The independent third party must:

(i) Be approved in advance by EPA, based on a demonstration of ability to perform the procedures required in this paragraph (f);

(ii) Be independent under the criteria specified in § 80.65(e)(2)(iii); and

(iii) Sign a commitment that contains the provisions specified in paragraph (i) of this section with regard to activities, facilities and documents relevant to compliance with the requirements of this paragraph (f).

(g) *Comparison of load port and port of entry testing.* (1) Load port and port of entry testing requirements, as follows:

(i) Any foreign refiner and any United States importer of Certified DFR-Diesel shall compare the results from the load port testing under paragraph (f) of this section, with the port of entry testing as reported under paragraph (o) of this section, for the volume of diesel and the sulfur value; except that

(ii) Where a vessel transporting Certified DFR-Diesel off loads this diesel fuel at more than one United States port of entry, and the conditions of paragraph (g)(2)(i) of this section are met at the first United States port of entry, the requirements of paragraph (g)(2) of this section do not apply at subsequent ports of entry if the United States importer obtains a certification from the vessel owner that meets the requirements of paragraph(s) of this section, that the vessel has not loaded any diesel fuel or blendstock between the first United States port of entry and the subsequent port of entry.

(2)(i) The requirements of this paragraph (g)(2) apply if:

(A) The temperature-corrected volumes determined at the port of entry and at the load port differ by more than one percent; or

(B) The sulfur value determined at the port of entry is higher than the sulfur value determined at the load port, and the amount of this difference is greater than the reproducibility amount specified for the port of entry test result by the American Society of Testing and Materials (ASTM).

(ii) The United States importer and the foreign refiner shall treat the diesel fuel as Non-Certified DFR-Diesel, and the foreign refiner shall exclude the diesel fuel volume from its motor vehicle diesel fuel volumes calculations and sulfur standard designations under § 80.523.

(h) *Attest requirements.* Refiners, for each calendar year, must arrange to have an attest engagement performed of the underlying documentation that forms the basis of any report required under this subpart. The attest engagement must comply with the procedures and requirements that apply to refiners under §§ 80.125 through 80.130 and must be submitted to the Administrator of EPA by May 30 of each year for the prior calendar year. The following additional procedures shall be carried out for any foreign refiner of DFR-Diesel:

(1) The inventory reconciliation analysis under § 80.128(b) and the tender analysis under § 80.128(c) shall include Non-DFR-Diesel.

(2) Obtain separate listings of all tenders of Certified DFR-Diesel and of Non-Certified DFR-Diesel, and obtain separate listings of Certified DFR-Diesel

based on whether it is 15 ppm sulfur content motor vehicle diesel fuel or 500 ppm sulfur content motor vehicle diesel fuel. Agree the total volume of tenders from the listings to the diesel fuel inventory reconciliation analysis in § 80.128(b), and to the volumes determined by the third party under paragraph (f)(1) of this section.

(3) For each tender under paragraph (h)(2) of this section, where the diesel fuel is loaded onto a marine vessel, report as a finding the name and country of registration of each vessel, and the volumes of DFR-Diesel loaded onto each vessel.

(4) Select a sample from the list of vessels identified in paragraph (h)(3) of this section used to transport Certified DFR-Diesel, in accordance with the guidelines in § 80.127, and for each vessel selected perform the following:

(i) Obtain the report of the independent third party, under paragraph (f) of this section, and of the United States importer under paragraph (o) of this section.

(A) Agree the information in these reports with regard to vessel identification, diesel fuel volumes and sulfur content test results.

(B) Identify, and report as a finding, each occasion the load port and port of entry sulfur content and volume results differ by more than the amounts allowed in paragraph (g) of this section, and determine whether the foreign refiner adjusted its refinery calculations as required in paragraph (g) of this section.

(ii) Obtain the documents used by the independent third party to determine transportation and storage of the Certified DFR-Diesel from the refinery to the load port, under paragraph (f) of this section. Obtain tank activity records for any storage tank where the Certified DFR-Diesel is stored, and pipeline activity records for any pipeline used to transport the Certified DFR-Diesel, prior to being loaded onto the vessel. Use these records to determine whether the Certified DFR-Diesel was produced at the refinery that is the subject of the attest engagement, and whether the Certified DFR-Diesel was mixed with any Non-Certified DFR-Diesel, Non-DFR-Diesel, or any Certified DFR-Diesel produced at a different refinery.

(5) Select a sample from the list of vessels identified in paragraph (h)(3) of this section used to transport certified and Non-Certified DFR-Diesel, in accordance with the guidelines in § 80.127, and for each vessel selected perform the following:

(i) Obtain a commercial document of general circulation that lists vessel arrivals and departures, and that includes the port and date of departure of the vessel, and the port of entry and date of arrival of the vessel.

(ii) Agree the vessel's departure and arrival locations and dates from the independent third party and United States importer reports to the information contained in the commercial document.

(6) Obtain separate listings of all tenders of Non-DFR-Diesel, and perform the following:

(i) Agree the total volume and sulfur content of tenders from the listings to the diesel fuel inventory reconciliation analysis in § 80.128(b).

(ii) Obtain a separate listing of the tenders under this paragraph (h)(6) where the diesel fuel is loaded onto a marine vessel. Select a sample from this listing in accordance with the guidelines in § 80.127, and obtain a commercial document of general circulation that lists vessel arrivals and departures, and that includes the port and date of departure and the ports and dates where the diesel fuel was off loaded for the selected vessels. Determine and report as a finding the country where the diesel fuel was off loaded for each vessel selected.

(7) In order to complete the requirements of this paragraph (h) an auditor shall:

(i) Be independent of the foreign refiner;

(ii) Be licensed as a Certified Public Accountant in the United States and a citizen of the United States, or be approved in advance by EPA based on a demonstration of ability to perform the procedures required in §§ 80.125 through 80.130 and this paragraph (h); and

(iii) Sign a commitment that contains the provisions specified in paragraph (i) of this section with regard to activities and documents relevant to compliance with the requirements of §§ 80.125 through 80.130 and this paragraph (h).

(i) *Foreign refiner commitments.* Any foreign refiner shall commit to and comply with the provisions contained in this paragraph (i) as a condition to being approved for a temporary refiner diesel fuel program option.

(1) Any United States Environmental Protection Agency inspector or auditor must be given full, complete and immediate access to conduct inspections and audits of the foreign refinery.

(i) Inspections and audits may be either announced in advance by EPA, or unannounced.

(ii) Access will be provided to any location where:

(A) Diesel fuel is produced;

(B) Documents related to refinery operations are kept;

(C) Diesel fuel or blendstock samples are tested or stored; and

(D) DFR-Diesel is stored or transported between the foreign refinery and the United States, including storage tanks, vessels and pipelines.

(iii) Inspections and audits may be by EPA employees or contractors to EPA.

(iv) Any documents requested that are related to matters covered by inspections and audits must be provided to an EPA inspector or auditor on request.

(v) Inspections and audits by EPA may include review and copying of any documents related to:

(A) Refinery baseline establishment, if applicable, including the volume and sulfur content; transfers of title or custody of any diesel fuel or blendstocks whether DFR-Diesel or Non-DFR-Diesel, produced at the foreign refinery during the period January 1, 1998 through the date of the refinery baseline petition or through the date of the inspection or audit if a baseline petition has not been approved, and any work papers related to refinery baseline establishment;

(B) The volume and sulfur content of DFR-Diesel;

(C) The proper classification of diesel fuel as being DFR-Diesel or as not being DFR-Diesel, or as Certified DFR-Diesel or as Non-Certified DFR-Diesel, or as meeting the 15 ppm sulfur standard under § 80.520(a)(1) or the 500 ppm sulfur standard under § 80.520(c);

(D) Transfers of title or custody to DFR-Diesel;

(E) Sampling and testing of DFR-Diesel;

(F) Work performed and reports prepared by independent third parties and by independent auditors under the requirements of this section, including work papers; and

(G) Reports prepared for submission to EPA, and any work papers related to such reports.

(vi) Inspections and audits by EPA may include taking samples of diesel fuel, diesel fuel additives or blendstock, and interviewing employees.

(vii) Any employee of the foreign refiner must be made available for interview by the EPA inspector or auditor, on request, within a reasonable time period.

(viii) English language translations of any documents must be provided to an EPA inspector or auditor, on request, within 10 working days.

(ix) English language interpreters must be provided to accompany EPA inspectors and auditors, on request.

(2) An agent for service of process located in the District of Columbia shall

be named, and service on this agent constitutes service on the foreign refiner or any employee of the foreign refiner for any action by EPA or otherwise by the United States related to the requirements of this subpart.

(3) The forum for any civil or criminal enforcement action related to the provisions of this section for violations of the Clean Air Act or regulations promulgated thereunder shall be governed by the Clean Air Act, including the EPA administrative forum where allowed under the Clean Air Act.

(4) United States substantive and procedural laws shall apply to any civil or criminal enforcement action against the foreign refiner or any employee of the foreign refiner related to the provisions of this section.

(5) Submitting a petition for participation in the diesel foreign refiner program or producing and exporting diesel fuel under any such program, and all other actions to comply with the requirements of this subpart relating to participation in any diesel foreign refiner program, or to establish an individual refinery motor vehicle diesel fuel volume baseline (if applicable) constitute actions or activities that satisfy the provisions of 28 U.S.C. section 1605(a)(2), but solely with respect to actions instituted against the foreign refiner, its agents and employees in any court or other tribunal in the United States for conduct that violates the requirements applicable to the foreign refiner under this subpart, including conduct that violates Title 18 U.S.C. section 1001 and Clean Air Act section 113(c)(2).

(6) The foreign refiner, or its agents or employees, will not seek to detain or to impose civil or criminal remedies against EPA inspectors or auditors, whether EPA employees or EPA contractors, for actions performed within the scope of EPA employment related to the provisions of this section.

(7) The commitment required by this paragraph (i) shall be signed by the owner or president of the foreign refiner business.

(8) In any case where DFR-Diesel produced at a foreign refinery is stored or transported by another company between the refinery and the vessel that transports the DFR-Diesel to the United States, the foreign refiner shall obtain from each such other company a commitment that meets the requirements specified in paragraphs (i)(1) through (7) of this section, and these commitments shall be included in the foreign refiner's petition to participate in any diesel foreign refiner program .

(j) *Sovereign immunity.* By submitting a petition for participation in any diesel foreign refiner program under this subpart (and baseline, if applicable) under this section, or by producing and exporting diesel fuel to the United States under any such program, the foreign refiner, and its agents and employees, without exception, become subject to the full operation of the administrative and judicial enforcement powers and provisions of the United States without limitation based on sovereign immunity, with respect to actions instituted against the foreign refiner, its agents and employees in any court or other tribunal in the United States for conduct that violates the requirements applicable to the foreign refiner under this subpart including conduct that violates Title 18 U.S.C. section 1001 and Clean Air Act section 113(c)(2).

(k) *Bond posting.* Any foreign refiner shall meet the requirements of this paragraph (k) as a condition to approval for any diesel foreign refiner program under this subpart.

(1) The foreign refiner shall post a bond of the amount calculated using the following equation: Bond = G × $0.01

Where:

Bond = amount of the bond in U.S. dollars.

G = the volume baseline for motor vehicle diesel fuel produced at the foreign refinery and exported to the United States, in gallons.

(2) Bonds shall be posted by:

(i) Paying the amount of the bond to the Treasurer of the United States;

(ii) Obtaining a bond in the proper amount from a third party surety agent that is payable to satisfy United States administrative or judicial judgments against the foreign refiner, provided EPA agrees in advance as to the third party and the nature of the surety agreement; or

(iii) An alternative commitment that results in assets of an appropriate liquidity and value being readily available to the United States, provided EPA agrees in advance as to the alternative commitment.

(3) Bonds posted under this paragraph (k) shall:

(i) Be used to satisfy any judicial judgment that results from an administrative or judicial enforcement action for conduct in violation of this subpart, including where such conduct violates Title 18 U.S.C. 1001 and Clean Air Act section 113(c)(2);

(ii) Be provided by a corporate surety that is listed in the United States Department of Treasury Circular 570 ‘‘Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds’’ (available from the Department of Treasury website at *http://www.fms.treas.gov* or from the Government Printing Office, phone (202) 512–1800); and

(iii) Include a commitment that the bond will remain in effect for at least five (5) years following the end of latest annual reporting period that the foreign refiner produces motor vehicle diesel fuel pursuant to the requirements of this subpart.

(4) On any occasion a foreign refiner bond is used to satisfy any judgment, the foreign refiner shall increase the bond to cover the amount used within 90 days of the date the bond is used.

(5) If the bond amount for a foreign refiner increases, the foreign refiner shall increase the bond to cover the shortfall within 90 days of the date the bond amount changes. If the bond amount decreases, the foreign refiner may reduce the amount of the bond beginning 90 days after the date the bond amount changes.

(l) [Reserved]

(m) *English language reports.* Any report or other document submitted to EPA by a foreign refiner shall be in English language, or shall include an English language translation.

(n) *Prohibitions.* (1) No person may combine Certified DFR-Diesel with any Non-Certified DFR-Diesel or Non-DFR-Diesel, and no person may combine Certified DFR-Diesel with any Certified DFR-Diesel produced at a different refinery, until the importer has met all the requirements of paragraph (o) of this section, except as provided in paragraph (e) of this section.

(2) No foreign refiner or other person may cause another person to commit an action prohibited in paragraph (n)(1) of this section, or that otherwise violates the requirements of this section.

(o) *United States importer requirements.* Any United States importer shall meet the following requirements:

(1) Each batch of imported motor vehicle diesel fuel shall be classified by the importer as being DFR-Diesel or as Non-DFR-Diesel, and each batch classified as DFR-Diesel shall be further classified as Certified DFR-Diesel or as Non-certified DFR-Diesel, and each batch of Certified DFR-Diesel shall be further classified as complying with the 500 ppm motor vehicle diesel fuel sulfur standard under § 80.520(c) or the 15 ppm motor vehicle diesel fuel sulfur standard under § 80.520(a)(1).

(2) Motor vehicle diesel fuel shall be classified as Certified DFR-Diesel or as Non-Certified DFR-Diesel according to the designation by the foreign refiner if this designation is supported by product

transfer documents prepared by the foreign refiner as required in paragraph (d) of this section, unless the diesel fuel is classified as Non-Certified DFR-Diesel under paragraph (g) of this section. Additionally, the importer shall comply with all requirements of this subpart applicable to domestic refiners subject to any diesel foreign refiner program under this subpart.

(3) For each diesel fuel batch classified as DFR-Diesel, any United States importer shall perform the following procedures:

(i) In the case of both Certified and Non-Certified DFR-Diesel, have an independent third party:

(A) Determine the volume of diesel fuel in the vessel;

(B) Use the foreign refiner's DFR-Diesel certification to determine the name and EPA-assigned registration number of the foreign refinery that produced the DFR-Diesel;

(C) Determine the name and country of registration of the vessel used to transport the DFR-Diesel to the United States; and

(D) Determine the date and time the vessel arrives at the United States port of entry.

(ii) In the case of Certified DFR-Diesel, have an independent third party:

(A) Collect a representative sample from each vessel compartment subsequent to the vessel's arrival at the United States port of entry and prior to off loading any diesel fuel from the vessel;

(B) Obtain the compartment samples; and

(C) Determine the sulfur value of each compartment sample using the methodologies specified in § 80.580, by:

(*1*) The third party analyzing the sample; or

(*2*) The third party observing the importer analyze the sample.

(4) Any importer shall submit reports within thirty days following the date any vessel transporting DFR-Diesel arrives at the United States port of entry:

(i) To the Administrator containing the information determined under paragraph (o)(3) of this section; and

(ii) To the foreign refiner containing the information determined under paragraph (o)(3)(ii) of this section, and including identification of the port and Credit Trading Area at which the product was offloaded.

(5) Any United States importer shall meet the requirements specified in § 80.520, for any imported motor vehicle diesel fuel that is not classified as Certified DFR-Diesel under paragraph (o)(2) of this section.

(p) *Truck Imports of Certified DFR-Diesel produced at a Foreign Refinery.* (1) Any refiner whose Certified DFR-Diesel is transported into the United States by truck may petition EPA to use alternative procedures to meet the following requirements:

(i) Certification under paragraph (d)(5) of this section;

(ii) Load port and port of entry sampling and testing under paragraphs (f) and (g) of this section;

(iii) Attest under paragraph (h) of this section; and

(iv) Importer testing under paragraph (o)(3) of this section.

(2) These alternative procedures must ensure Certified DFR-Diesel remains segregated from Non-Certified DFR-Diesel and from Non-DFR-Diesel until it is imported into the United States. The petition will be evaluated based on whether it adequately addresses the following:

(i) Provisions for monitoring pipeline shipments, if applicable, from the refinery, that ensure segregation of Certified DFR-Diesel from that refinery from all other diesel fuel;

(ii) Contracts with any terminals and/or pipelines that receive and/or transport Certified DFR-Diesel, that prohibit the commingling of Certified DFR-Diesel with any of the following:

(A) Other Certified DFR-Diesel from other refineries.

(B) All Non-Certified DFR-Diesel.

(C) All Non-DFR-Diesel;

(iii) Procedures for obtaining and reviewing truck loading records and United States import documents for Certified DFR-Diesel to ensure that such diesel fuel is only loaded into trucks making deliveries to the United States;

(iv) Attest procedures to be conducted annually by an independent third party that review loading records and import documents based on volume reconciliation, or other criteria, to confirm that all Certified DFR-Diesel remains segregated throughout the distribution system and is only loaded into trucks for import into the United States.

(3) The petition required by this section must be submitted to EPA along with the application for temporary refiner relief individual refinery highway diesel sulfur standard under this subpart I and this section.

(q) *Withdrawal or suspension of a foreign refinery's temporary refinery flexibility program approval.* EPA may withdraw or suspend a diesel refiner temporary compliance option diesel fuel sulfur program approval for a foreign refinery where:

(1) A foreign refiner fails to meet any requirement of this section;

(2) A foreign government fails to allow EPA inspections as provided in paragraph (i)(1) of this section;

(3) A foreign refiner asserts a claim of, or a right to claim, sovereign immunity in an action to enforce the requirements in this subpart; or

(4) A foreign refiner fails to pay a civil or criminal penalty that is not satisfied using the foreign refiner bond specified in paragraph (k) of this section.

(r) *Early use of a foreign refiner baseline.* (1) A foreign refiner may begin using an individual refinery baseline before EPA has approved the baseline, provided that:

(i) A baseline petition has been submitted as required in paragraph (b) of this section;

(ii) EPA has made a provisional finding that the baseline petition is complete;

(iii) The foreign refiner has made the commitments required in paragraph (i) of this section;

(iv) The persons who will meet the independent third party and independent attest requirements for the foreign refinery have made the commitments required in paragraphs (f)(3)(iii) and (h)(7)(iii) of this section; and

(v) The foreign refiner has met the bond requirements of paragraph (k) of this section.

(2) In any case where a foreign refiner uses an individual refinery baseline before final approval under paragraph (r)(1) of this section, and the foreign refinery baseline values that ultimately are approved by EPA are more stringent than the early baseline values used by the foreign refiner, the foreign refiner shall recalculate its compliance, ab initio, using the baseline values approved by the EPA, and the foreign refiner shall be liable for any resulting violation of the motor vehicle highway diesel fuel requirements.

(s) *Additional requirements for petitions, reports and certificates.* Any petition for approval to produce motor vehicle diesel fuel subject to the diesel foreign refiner program, any alternative procedures under paragraph (p) of this section, any report or other submission required by paragraph (c), (f)(2), or (i) of this section, and any certification under paragraph (d)(3) of this section shall be:

(1) Submitted in accordance with procedures specified by the Administrator, including use of any forms that may be specified by the Administrator.

(2) Be signed by the president or owner of the foreign refiner company, or by that person's immediate designee, and shall contain the following declaration:

> I hereby certify: (1) that I have actual authority to sign on behalf of and to bind

[insert name of foreign refiner] with regard to all statements contained herein; (2) that I am aware that the information contained herein is being certified, or submitted to the United States Environmental Protection Agency, under the requirements of 40 CFR Part 80, subpart I, and that the information is material for determining compliance under these regulations; and (3) that I have read and understand the information being certified or submitted, and this information is true, complete and correct to the best of my knowledge and belief after I have taken reasonable and appropriate steps to verify the accuracy thereof.

I affirm that I have read and understand the provisions of 40 CFR Part 80, subpart I, including 40 CFR 80.620 apply to [insert name of foreign refiner]. Pursuant to Clean Air Act section 113(c) and Title 18, United States Code, section 1001, the penalty for furnishing false, incomplete or misleading information in this certification or submission is a fine of up to $10,000 U.S., and/or imprisonment for up to five years.

PART 86—CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES

11. The authority citation for part 86 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

12. Section 86.1 is amended by revising paragraph (b)(1) to read as follows:

§ 86.1 Reference materials.

* * * * *

(b) * * *

(1) *ASTM material.* The following table sets forth material from the American Society for Testing and Materials that has been incorporated by reference. The first column lists the number and name of the material. The second column lists the section(s) of this part, other than this section, in which the matter is referenced. Copies of these materials may be obtained from American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959.

Document number and name	40 CFR part 86 reference
ASTM E29–67 (Reapproved 1980), Standard Recommended Practice for Indicating Which Places of Figures Are To Be Considered Significant in Specified Limiting Values.	86.1105–87.
ASTM E29–90, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.	86.609–84; 86.609–96; 86.609–97; 86.609–98; 86.1009–84; 86.1009–96; 86.1442; 86.1708–99; 86.1709–99; 86.1710–99; 86.1728–99.
ASTM D5186–91, Standard Test Method for Determination of Aromatic Content of Diesel Fuels by Supercritical Fluid Chromatography.	86.113–07; 86.1313–91; 86.1313–94; 86.1313–98; 1313–2007.
ASTM D2163–91, Standard Test Method for Analysis of Liquefied Petroleum (LP) Gases and Propane Concentrates by Gas Chromatography.	86.113–94; 86.1213–94; 86.1313–94.
ASTM D1945–91, Standard Test Method for Analysis of Natural Gas By Gas Chromatography	86.113–94; 86.513–94; 86.1213–94; 86.1313–94.
ASTM E29–93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.	86.098–15; 86.004–15; 86.007–11; 86.007–15; 86.1803–01; 86.1823–01; 86.1824–01; 86.1825–01; 86.1837–01.
ASTM D2986–95a, (Reapproved 1999) Standard Practice for Evaluation of Air Assay Media by the Monodisperse DOP (Dioctyl Phthalate) Smoke Test.	86.1310–2007.
ASTM F1471–93, Standard Test Method for Air Cleaning Performance of a High-Efficiency Particulate Air-Filter System.	86.1310–2007.

* * * * *

13. Section 86.004–2 is amended by adding in alphabetical order a definition of ''U.S.-directed production'' to read as follows:

§ 86.004–2 Definitions.

* * * * *

U.S.-directed production means the engines and/or vehicles (as applicable) produced by a manufacturer for which the manufacturer has reasonable assurance that sale was or will be made to ultimate purchasers in the United States, excluding engines and/or vehicles that are certified to state emission standards different than the emission standards in this part.

* * * * *

14. Section 86.004–28 is amended by adding paragraph (i) to read as follows:

§ 86.004–28 Compliance with emission standards.

* * * * *

(i) Emission results from heavy-duty engines equipped with exhaust aftertreatment may need to be adjusted to account for regeneration events. This provision only applies for engines equipped with emission controls that are regenerated on an infrequent basis. For the purpose of this paragraph (i), the term ''regeneration'' means an event during which emissions levels change while the aftertreatment performance is being restored by design. Examples of regenerations are increasing exhaust gas temperature to remove sulfur from an adsorber or increasing exhaust gas temperature to oxidize PM in a trap. For the purpose of this paragraph (i), the term ''infrequent'' means having an expected frequency of less than once per transient test cycle. Calculation and use of adjustment factors are described in paragraphs (i)(1) through (i)(5) of this section.

(1) *Development of adjustment factors.* Manufacturers must develop separate pairs of adjustment factors (an upward adjustment factor and a downward adjustment factor) for each pollutant based on measured emission data and observed regeneration frequency. Adjustment factors may be carried-over to subsequent model years or carried-across to other engine families only where the Administrator determines that such carry-over or carry-across is consistent with good engineering judgment. Adjustment factors should generally apply to an entire engine family, but manufacturers may develop separate adjustment factors for different engine configurations within an engine family. All adjustment factors for regeneration are additive.

(2) *Calculation of adjustment factors.* The adjustment factors are calculated from the following parameters: the measured emissions from a test in which the regeneration occurs (EF_H), the measured emissions from a test in which the regeneration does not occur (EF_L), and the frequency of the regeneration event in terms of fraction of tests during which the regeneration occurs (F). The average emission rate (EF_A) is calculated as:

$$EF_A = (F)(EF_H) + (1 - F)(EF_L)$$

(i) The upward adjustment factor (UAF) is calculated as: $UAF = EF_A - EF_L$.

(ii) The downward adjustment factor (DAF) is calculated as: $DAF = EF_A - EF_H$.

(3) *Use of adjustment factors.* Upward adjustment factors are added to

measured emission rates for all tests in which the regeneration does not occur. Downward adjustment factors are added to measured emission rates for all tests in which the regeneration occurs. The occurrence of the regeneration must be identified in a manner that is readily apparent during all testing. Where no regeneration is identified, the upward adjustment factor shall be applied.

(4) *Sample calculation.* If EF_L is 0.10 g/bhp-hr, EF_H is 0.50 g/bhp-hr, and F is 0.1 (*i.e.*, the regeneration occurs once for each ten tests), then:

$EF_A = (0.1)(0.5 \text{ g/bhp-hr}) + (1.0 - 0.1)(0.1 \text{ g/bhp-hr}) = 0.14 \text{ g/bhp-hr}$

$UAF = 0.14 \text{ g/bhp-hr} - 0.10 \text{ g/bhp-hr} = 0.04 \text{ g/bhp-hr}$

$DAF = 0.14 \text{ g/bhp-hr} - 0.50 \text{ g/bhp-hr} = -0.36 \text{ g/bhp-hr}$

(5) *Options.* (i) A manufacturer may elect to omit adjustment factors for one or more of its engine families (or configurations) because the effect of the regeneration is small, or because it is not practical to identify when regenerations occur. In these cases, no upward or downward adjustment factor shall be added, and the manufacturer is liable for compliance with the emission standards for all tests, without regard to whether a regeneration occurs.

(ii) Upon request by the manufacturer, the Administrator may account for regeneration events differently than is provided in this paragraph (i). However, this option only applies for events that occur extremely infrequently, and which cannot be practically addressed using the adjustment factors described in this paragraph (i).

15. Section 86.004–40 is amended by revising the introductory text to read as follows:

§ 86.004–40 Heavy-duty engine rebuilding practices.

The provisions of this section are applicable to heavy-duty engines subject to model year 2004 or later standards and are applicable to the process of engine rebuilding (or rebuilding a portion of an engine or engine system). The process of engine rebuilding generally includes disassembly, replacement of multiple parts due to wear, and reassembly, and also may include the removal of the engine from the vehicle and other acts associated with rebuilding an engine. Any deviation from the provisions contained in this section is a prohibited act under section 203(a)(3) of the Clean Air Act (42 U.S.C. 7522(a)(3)).

* * * * *

16. Section 86.005–10 is amended by revising paragraph (a)(1)(ii)(C) to read as follows:

§ 86.005–10 Emission standards for 2005 and later model year Otto-cycle heavy-duty engines and vehicles.

* * * * *

(a) * * *

(1) * * *

(ii) * * *

(C) *Idle carbon monoxide.* For all Otto-cycle HDEs utilizing aftertreatment technology, and not certified to the onboard diagnostics requirements of § 86.005–17: 0.50 percent of exhaust gas flow at curb idle.

* * * * *

17. Section 86.005–17 is amended by revising paragraphs (b) introductory text, (b)(1), (b)(2), (b)(3), (b)(4), (b)(5), and (k) to read as follows:

§ 86.005–17 On-board diagnostics.

* * * * *

(b) *Malfunction descriptions.* The OBD system must detect and identify malfunctions in all monitored emission-related engine systems or components according to the following malfunction definitions as measured and calculated in accordance with test procedures set forth in subpart N of this part (engine-based test procedures) excluding the test procedure referred to as the ‘‘Supplemental emission test; test cycle and procedures’’ contained in § 86.1360, and excluding the test procedure referred to as the ‘‘Not-To-Exceed Test Procedure’’ contained in § 86.1370, and excluding the test procedure referred to as the ‘‘Load Response Test’’ contained in § 86.1380.

(1) *Catalysts and particulate traps.* (i) *Otto-cycle.* Catalyst deterioration or malfunction before it results in an increase in NMHC (or NO_X+NMHC, as applicable) emissions 1.5 times the NMHC (or NO_X+NMHC, as applicable) standard or FEL, as compared to the NMHC (or NO_X+NMHC, as applicable) emission level measured using a representative 4000 mile catalyst system.

(ii) *Diesel.* (A) If equipped, catalyst deterioration or malfunction before it results in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NO_X (or NO_X+NMHC, as applicable) or PM. This requirement applies only to reduction catalysts; monitoring of oxidation catalysts is not required. This monitoring need not be done if the manufacturer can demonstrate that deterioration or malfunction of the system will not result in exceedance of the threshold.

(B) If equipped with a particulate trap, catastrophic failure of the device must be detected. Any particulate trap whose complete failure results in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NMHC (or NO_X+NMHC, as applicable) or PM must be monitored for such catastrophic failure. This monitoring need not be done if the manufacturer can demonstrate that a catastrophic failure of the system will not result in exceedance of the threshold.

(2) *Engine Misfire.* (i) *Otto-cycle.* Engine misfire resulting in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NMHC, NO_X (or NO_X+NMHC, as applicable) or CO; and any misfire capable of damaging the catalytic converter.

(ii) *Diesel.* Lack of cylinder combustion must be detected.

(3) Oxygen sensors. If equipped, oxygen sensor deterioration or malfunction resulting in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NMHC, NO_X (or NO_X+NMHC, as applicable) or CO.

(4) *Evaporative leaks.* If equipped, any vapor leak in the evaporative and/or refueling system (excluding the tubing and connections between the purge valve and the intake manifold) greater than or equal in magnitude to a leak caused by a 0.040 inch diameter orifice; an absence of evaporative purge air flow from the complete evaporative emission control system. Where fuel tank capacity is greater than 25 gallons, the Administrator may, following a request from the manufacturer, revise the size of the orifice to the smallest orifice feasible, based on test data, if the most reliable monitoring method available cannot reliably detect a system leak equal to a 0.040 inch diameter orifice.

(5) *Other emission control systems.* Any deterioration or malfunction occurring in an engine system or component directly intended to control emissions, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, the secondary air system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding 1.5 times the applicable emission standard or FEL for NMHC, NO_X (or NO_X+NMHC, as applicable), CO or diesel PM. For engines equipped with a secondary air system, a functional check, as described in paragraph (b)(6) of this section, may satisfy the requirements of this paragraph (b)(5) provided the manufacturer can demonstrate that deterioration of the flow distribution system is unlikely. This demonstration is subject to Administrator approval and, if the demonstration and associated functional check are approved, the diagnostic system must indicate a malfunction when some degree of secondary airflow is not detectable in

the exhaust system during the check. For engines equipped with positive crankcase ventilation (PCV), monitoring of the PCV system is not necessary provided the manufacturer can demonstrate to the Administrator's satisfaction that the PCV system is unlikely to fail.

* * * * *

(k) *Phase-in for heavy-duty engines.* Manufacturers of heavy-duty engines must comply with the OBD requirements in this section according to the following phase-in schedule, based on the percentage of projected engine sales within each category. The 2004 model year requirements in the following phase-in schedule are applicable only to heavy-duty Otto-cycle engines where the manufacturer has selected Otto-cycle Option 1 or Option 2 for alternative 2004 compliance according to § 86.005–01(c)(1) or (2). The 2005 through 2007 requirements in the following phase-in schedule apply to all heavy-duty engines intended for use in a heavy-duty vehicle weighing 14,000 pounds GVWR or less. Manufacturers may exempt 2005 model year diesel heavy-duty engines from the requirements of this section if the 2005 model year commences before July 31, 2004 from the requirements of this section. Manufacturers may exempt 2005 model year Otto-cycle heavy-duty engines and vehicles from the requirements of this section if the manufacturer has selected Otto-cycle Option 3 and if the 2005 model year commences before July 31, 2004. For the purposes of calculating compliance with the phase-in provisions of this paragraph (k), heavy-duty engines may be combined with heavy-duty vehicles subject to the phase-in requirements of paragraph § 86.1806–05(l). The OBD Compliance phase-in table follows:

OBD COMPLIANCE PHASE-IN FOR HEAVY-DUTY ENGINES INTENDED FOR USE IN A HEAVY-DUTY VEHICLE WEIGHING 14,000 POUNDS GVWR OR LESS

Model year	Otto-cycle phase-in based on projected sales	Diesel Phase-in based on projected sales
2004 MY	Applicable only to Otto-cycle engines complying with Options 1 or 2; 40% compliance; alternative fuel waivers available.	
2005 MY	60% compliance; alternative fuel waivers available	50% compliance; alternative fuel waivers available.
2006 MY	80% compliance; alternative fuel waivers available	50% compliance; alternative fuel waivers available.
2007 MY	80% compliance; alternative fuel waivers available	100% compliance.
2008+ MY	100% compliance	100% compliance.

18. Section 86.007–11 is amended by revising the introductory text, paragraphs (a) through (a)(2), (a)(3), (a)(4)(i), (b)(3) through (d), and adding paragraphs (a)(4)(iv)(C), (a)(4)(v), (e), (f), (g) and (h) to read as follows:

§ 86.007–11 Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles.

This section applies to new 2007 and later model year diesel HDEs. Section 86.007–11 includes text that specifies requirements that differ from § 86.004–11. Where a paragraph in § 86.004–11 is identical and applicable to § 86.007–11, this may be indicated by specifying the corresponding paragraph and the statement "[Reserved]. For guidance see § 86.004–11.".

(a)(1) Exhaust emissions from new 2007 and later model year diesel HDEs shall not exceed the following:

(i) *Oxides of Nitrogen* (NO_X). (A) 0.20 grams per brake horsepower-hour (0.075 grams per megajoule).

(B) A manufacturer may elect to include any or all of its diesel HDE families in any or all of the NO_X and NO_X plus NMHC emissions ABT programs for HDEs, within the restrictions described in § 86.007–15 or § 86.004–15. If the manufacturer elects to include engine families in any of these programs, the NO_X FELs may not exceed the following FEL caps: 2.00 grams per brake horsepower-hour (0.75 grams per megajoule) for model years before 2010; 0.50 grams per brake horsepower-hour (0.19 grams per megajoule) for model years 2010 and later. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading programs.

(ii)(A) *Non-Methane Hydrocarbons (NMHC) for engines fueled with either diesel fuel, natural gas, or liquefied petroleum gas.* 0.14 grams per brake horsepower-hour (0.052 grams per megajoule).

(B) *Non-Methane Hydrocarbon Equivalent (NMHCE) for engines fueled with methanol.* 0.14 grams per brake horsepower-hour (0.052 grams per megajoule).

(iii) *Carbon monoxide.* (A) 15.5 grams per brake horsepower-hour (5.77 grams per megajoule).

(B) 0.50 percent of exhaust gas flow at curb idle (methanol-, natural gas-, and liquefied petroleum gas-fueled diesel HDEs only). This does not apply for vehicles certified to the requirements of § 86.005–17

(iv) *Particulate.* (A) 0.01 grams per brake horsepower-hour (0.0037 grams per megajoule).

(B) A manufacturer may elect to include any or all of its diesel HDE families in any or all of the particulate ABT programs for HDEs, within the restrictions described in § 86.007–15 or other applicable sections. If the manufacturer elects to include engine families in any of these programs, the particulate FEL may not exceed 0.02 grams per brake horsepower-hour (0.0075 grams per megajoule).

(2) The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over the operating schedule set forth in paragraph (f)(2) of appendix I to this part, and measured and calculated in accordance with the procedures set forth in subpart N or P of this part, except as noted in § 86.007–23(c)(2).

(3) *SET* (i) The weighted average exhaust emissions, as determined under § 86.1360–2007(e)(5) pertaining to the supplemental emission test cycle, for each regulated pollutant shall not exceed 1.0 times the applicable emission standards or FELs specified in paragraph (a)(1) of this section.

(ii) For engines not having a NO_X FEL less than1.5 g/bhp-hr, gaseous exhaust emissions shall not exceed the steady-state interpolated values determined by the Maximum Allowable Emission Limits (for the corresponding speed and load), as determined under § 86.1360–2007(f), when the engine is operated in the steady-state control area defined under § 86.1360–2007(d).

(4) *NTE* (i)(A) The brake-specific exhaust NMHC or NO_X emissions in g/bhp-hr, as determined under § 86.1370–2007 pertaining to the not-to-exceed test procedures, shall not exceed 1.5 times the applicable NMHC or NO_X emission standards or FELs specified in paragraph (a)(1) of this section, during engine and vehicle operation specified

in paragraph (a)(4)(ii) of this section except as noted in paragraph (a)(4)(iii) of this section.

(B) For engines not having a NO_X FEL less than1.50 g/bhp-hr, the brake-specific NO_X and NMHC exhaust emissions in g/bhp-hr, as determined under § 86.1370–2007 pertaining to the not-to-exceed test procedures, shall not exceed 1.25 times the applicable emission standards or FELs specified in paragraph (a)(1) of this section (or of § 86.004–11, as allowed by paragraph (g) of this section), during engine and vehicle operation specified in paragraph (a)(4)(ii) of this section except as noted in paragraph (a)(4)(iii) of this section.

(C) The brake-specific exhaust PM emissions in g/bhp-hr, as determined under § 86.1370–2007 pertaining to the not-to-exceed test procedures, shall not exceed 1.5 times the applicable PM emission standards or FEL (for FELs above the standard only) specified in paragraph (a)(1) of this section, during engine and vehicle operation specified in paragraph (a)(4)(ii) of this section except as noted in paragraph (a)(4)(iii) of this section.

(D) The brake-specific exhaust CO emissions in g/bhp-hr, as determined under § 86.1370–2007 pertaining to the not-to-exceed test procedures, shall not exceed 1.25 times the applicable CO emission standards or FEL specified in paragraph (a)(1) of this section, during engine and vehicle operation specified in paragraph (a)(4)(ii) of this section except as noted in paragraph (a)(4)(iii) of this section.

* * * * *

(iv) * * *

(C) For model years 2010 through 2013, the Administrator may allow up to three deficiencies per engine family. The provisions of paragraphs (a)(4)(iv)(A) and (B) of this section apply for deficiencies allowed by this paragraph (a)(4)(iv)(C). In determining whether to allow the additional deficiencies, the Administrator may consider any relevant factors, including the factors identified in paragraph (a)(4)(iv)(A) of this section. If additional deficiencies are approved, the Administrator may set any additional conditions that he/she determines to be appropriate.

(v) The emission limits specified in paragraphs (a)(3) and (a)(4) of this section shall be rounded to the same number of significant figures as the applicable standards in paragraph (a)(1) of this section using ASTM E29–93a (Incorporated by reference at § 86.1).

* * * * *

(b)(3) and (b)(4) [Reserved]. For guidance see § 86.004–11.

(c) No crankcase emissions shall be discharged directly into the ambient atmosphere from any new 2007 or later model year diesel HDE, with the following exception: HDEs equipped with turbochargers, pumps, blowers, or superchargers for air induction may discharge crankcase emissions to the ambient atmosphere if the emissions are added to the exhaust emissions (either physically or mathematically) during all emission testing. Manufacturers taking advantage of this exception must manufacture the engines so that all crankcase emission can be routed into a dilution tunnel (or other sampling system approved in advance by the Administrator), and must account for deterioration in crankcase emissions when determining exhaust deterioration factors. For the purpose of this paragraph (c), crankcase emissions that are routed to the exhaust upstream of exhaust aftertreatment during all operation are not considered to be ‘‘discharged directly into the ambient atmosphere.’’

(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 paragraphs (a), (b), (c), and (d) of this section.

(e) [Reserved]. For guidance see § 86.004–11.

(f) (1) Model year 2007 and later diesel-fueled heavy-duty engines and vehicles for sale in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands shall be subject to the same standards and requirements as apply to 2006 model year diesel heavy-duty engines and vehicles, but only if the vehicle or engine bears a permanently affixed label stating:

> THIS ENGINE (or VEHICLE, as applicable) CONFORMS TO US EPA EMISSION STANDARDS APPLICABLE TO MODEL YEAR 2006. THIS ENGINE (or VEHICLE, as applicable) DOES NOT CONFORM TO US EPA EMISSION REQUIREMENTS IN EFFECT AT TIME OF PRODUCTION AND MAY NOT BE IMPORTED INTO THE UNITED STATES OR ANY TERRITORY OF THE UNITED STATES EXCEPT GUAM, AMERICAN SAMOA, OR THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS.

(2) The importation or sale of such a vehicle or engine for use at any location U.S. other than Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands shall be considered a violation of section 203(a)(1) of the Clean Air Act. In addition, vehicles or vehicle engines subject to this exemption may not subsequently be imported or sold into any state or territory of the United States other than Guam, American Samoa, or Commonwealth of the Northern Mariana Islands.

(g) Phase-in options. (1) For model years 2007, 2008, and 2009, manufacturers may certify some of their engine families to the combined NO_X plus NMHC standard applicable to model year 2006 engines under § 86.004–11, in lieu of the separate NO_X and NMHC standards specified in paragraph (a)(1) of this section. These engines must comply with all other requirements applicable to model year 2007 engines. The combined number of engines in the engine families certified to the 2006 combined NO_X plus NMHC standard may not exceed 50 percent of the manufacturer's U.S.-directed production of heavy-duty diesel motor vehicle engines for model year 2007, 2008, or 2009, except as explicitly allowed by this paragraph (g).

(2)(i) Manufacturers certifying engines to all of the applicable standards listed in paragraph (a) and (c) of this section (without using credits) prior to model year 2007 may reduce the number of engines that are required to meet the standards listed in paragraph (a) of this section in model year 2007, 2008 and/or 2009, taking into account the phase-in option provided in paragraph (g)(1) of this section. For every two engines that are certified early, the manufacturer may reduce the number of engines that are required by paragraph (g)(1) of this section to meet standards listed in paragraph (a)(1) of this section by three engines. For example, if a manufacturer produces 100 heavy-duty diesel engines in 2006 that meet all of the applicable standards listed in paragraph (a) of this section, and it produced 10,000 heavy-duty diesel engines in 2007, then only 4,850 $((10{,}000)(0.50) - (100)(1.5))$ of the engines would need to comply with the standards listed in paragraph (a) of this section.

(ii) Manufacturers certifying engines to the PM standards listed in paragraph (a), and to all of the applicable standards in paragraph (c) of this section (without using credits) prior to model year 2007 may reduce the number of engines that are required to meet the PM standard listed in paragraph (a) of this section in model year 2007, 2008 and/or 2009. For every two engines that are certified to the PM standard early, the manufacturer may reduce the number of engines that are otherwise required to meet the PM standard listed in paragraph (a)(1) of this section by three engines.

(3) Manufacturers may initially base compliance with the phase-in requirements of paragraph (g)(1) or (g)(2) of this section on projected U.S.-directed production estimates. This is allowed for model year 2007 and/or 2008. However, if a manufacturer's actual U.S. directed production volume of engines that comply with the model year 2007 NO_X and NMHC standards is less than the required amount, the shortfall (in terms of number of engines) must be made up prior to 2010. For example, if a manufacturer plans in good faith to produce 50 percent of its projected 10,000 2007 engines (i.e., 5,000 engines) in compliance with the 2007 NO_X and NMHC standard, but is only able to produce 4,500 such engines of an actual 10,000 2007 engines, the manufacturer would need to produce an extra 500 engines in 2008 or 2009 in compliance with the 2007 NO_X and NMHC standard. The deficit allowed by this paragraph (g)(3) may not exceed 25 percent of the U.S. directed production volume.

(4) Manufacturers certifying engines to a voluntary NO_X standard of 0.10 g/bhp-hr (without using credits) in addition to all of the other applicable standards listed in paragraphs (a) and (c) of this section prior to model year 2007 may reduce the number of engines that are required to meet the standards listed in paragraph (a)(1) of this section in model year 2007, 2008 and/or 2009, taking into account the phase-in option provided in paragraph (g)(1) of this section. For every engine that is certified early under this provision, the manufacturer may reduce the number of engines that are required by paragraph (g)(1) of this section to meet the standards listed in paragraph (a)(1) of this section by two engines.

(5) For engines certified under paragraph (g)(1) of this section to the NO_X+NMHC standard in § 86.004–11, the standards or FELs to which they are certified shall be used for the purposes of paragraphs (a)(3) and (a)(4) of this section.

(h)(1) For model years prior to 2012, for purposes of determining compliance after title or custody has transferred to the ultimate purchaser, for engines having a NO_X FEL no higher than 1.30 g/bhp-hr, the applicable compliance limit shall be determined by adding the applicable adjustment from paragraph (h)(2) of this section to the otherwise applicable standard or FEL for NO_X.

(2)(i) For engines with 110,000 or fewer miles, the adjustment is 0.10 g/bhp-hr.

(ii) For engines with 110,001 to 185,000 miles, the adjustment is 0.15 g/bhp-hr.

(iii) For engines with 185,001 or more miles, the adjustment is 0.20 g/bhp-hr.

(3) For model years prior to 2012, for purposes of determining compliance after title or custody has transferred to the ultimate purchaser, the applicable compliance limit shall be determined by adding 0.01 g/bhp-hr to the otherwise applicable standard or FEL for PM.

19. A new § 86.007–is added to Subpart A to read as follows:

§ 86.007–15 NO_X and particulate averaging, trading, and banking for heavy-duty engines.

Section 86.007–15 includes text that specifies requirements that differ from § 86.004–15. Where a paragraph in § 86.004–15 is identical and applicable to § 86.007–15, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.004–15.''

(a) through (l) [Reserved]. For guidance see § 86.004–15.

(m) The following provisions apply for model year 2007 and later engines (including engines certified during years 2007–2009 under the phase-in provisions of § 86.007–11(g)(1), § 86.005–10(a), or § 86.008–10(f)(1)). These provisions apply instead of the provisions of paragraphs § 86.004–15 (a) through (k) to the extent that they are in conflict.

(1) Manufacturers of Otto-cycle engines may participate in an NMHC averaging, banking and trading program to show compliance with the standards specified in § 86.008–10. The generation and use of NMHC credits are subject to the same provisions in paragraphs § 86.004–15 (a) through (k) that apply for NO_X plus NMHC credits, except as otherwise specified in this section.

(2) Credits are calculated as NO_X or NMHC credits for engines certified to separate NO_X and NMHC standards. NO_X plus NMHC credits (including banked credits and credits that are generated during years 2007–2009 under the phase-in provisions of § 86.007–11(g)(1), § 86.005–10(a), or § 86.008–10(f)(1)) may be used to show compliance with 2007 or later NO_X standards (NO_X or NMHC standards for Otto-cycle engines), subject to an 0.8 discount factor (e.g., 100 grams of NO_X plus NMHC credits is equivalent to 80 grams of NO_X credits).

(3) NO_X or NMHC (or NO_X plus NMHC) credits may be exchanged between heavy-duty Otto-cycle engine families certified to the engine standards of this subpart and heavy-duty Otto-cycle engine families certified to the chassis standards of subpart S of this part, subject to an 0.8 discount factor (e.g., 100 grams of NO_X (or NO_X plus NMHC) credits generated from engines would be equivalent to 80 grams of NO_X credits if they are used in the vehicle program of subpart S, and vice versa).

(4) Credits that were previously discounted when they were banked according to paragraph (c) of § 86.004–15, are subject to an additional discount factor of 0.888 instead of the 0.8 discount factor otherwise required by paragraph (m)(2) or (m)(3) of this section. This results in a total discount factor of 0.8 (0.9 × 0.888 = 0.8).

(5) For diesel engine families, the combined number of engines certified to FELs higher than 0.50 g/bhp-hr using banked NO_X (and/or NO_X plus NMHC) credits in any given model year may not exceed 10 percent of the manufacturer's U.S.-directed production of engines in all heavy-duty diesel engine families for that model year.

(6) The FEL must be expressed to the same number of decimal places as the standard (generally, one-hundredth of a gram per brake horsepower-hour). For engines certified to standards expressed only one-tenth of a gram per brake horsepower-hour, if the FEL is below 1.0, then add a zero to the standard in the second decimal place and express the FEL to nearest one-hundredth of a gram per brake horsepower-hour.

(7) Credits are to be rounded to the nearest one-hundredth of a Megagram using ASTM E29–93a (Incorporated by reference at § 86.1).

(8) Credits generated for 2007 and later model year diesel engine families, or generated for 2008 and later model year Otto-cycle engine families are not discounted (except as specified in paragraph (m)(2) or (m)(3) of this section), and do not expire.

(9) For the purpose of using or generating credits during a phase-in of new standards, a manufacturer may elect to split an engine family into two subfamilies (e.g., one which uses credits and one which generates credits). The manufacturer must indicate in the application for certification that the engine family is to be split, and may assign the numbers and configurations of engines within the respective subfamilies at any time prior to the submission of the end-of-year report required by § 86.001–23.

(i) Manufacturers certifying a split diesel engine family to both the Phase 1 and Phase 2 standards with equally sized subfamilies may exclude the engines within that split family from end-of-year NO_X (or NO_X+NMHC) ABT calculations, provided that neither subfamily generates credits for use by other engine families, or uses banked credits, or uses averaging credits from other engine families. All of the engines in that split family must be excluded from the phase-in calculations of § 86.007–11(g)(1) (both from the number of engines complying with the standards being phased-in and from the total number of U.S.-directed production engines.)

(ii) Manufacturers certifying a split Otto-cycle engine family to both the Phase 1 and Phase 2 standards with equally sized subfamilies may exclude the engines within that split family from end-of-year NO_X (or NO_X+NMHC) ABT calculations, provided that neither subfamily generates credits for use by other engine families, or uses banked credits, or uses averaging credits from other engine families. All of the engines in that split family must be excluded from the phase-in calculations of § 86.008–10(f)(1) (both from the number of engines complying with the standards being phased-in and from the total number of U.S.-directed production engines.)

(iii) Manufacturers certifying a split engine family may label all of the engines within that family with a single NO_X or NO_X+NMHC FEL. The FEL on the label will apply for all SEA or other compliance testing.

(iv) Notwithstanding the provisions of paragraph (m)(9)(iii) of this section, for split families, the NO_X FEL shall be used to determine applicability of the provisions of § 86.007–11(a)(3)(ii), (a)(4)(i)(B), and (h)(1), and § 86.008–10(g).

(10) For model years 2007 through 2009, to be consistent with the phase-in provisions of § 86.007–11(g)(1), credits generated from engines in one diesel engine service class (e.g., light-heavy duty diesel engines) may be used for averaging by engines in a different diesel engine service class, provided the credits are calculated for both engine families using the conversion factor and useful life of the engine family using the credits, and the engine family using the credits is certified to the standards listed in § 86.007–11(a)(1). Banked or traded credits may not be used by any engine family in a different service class than the service class of the engine family generating the credits.

20. A new § 86.007–23 is added to Subpart A to read as follows:

§ 86.007–23 Required data.

Section 86.007–23 includes text that specifies requirements that differ from § 86.095–23, § 86.098–23, or § 86.001–23. Where a paragraph in § 86.095–23, § 86.098–23, or § 86.001–23 is identical and applicable to § 86.007–23, this may be indicated by specifying the corresponding paragraph and the statement ‘‘[Reserved]. For guidance see § 86.095–23.’’, ‘‘[Reserved]. For guidance see § 86.098–23.’’, or ‘‘[Reserved]. For guidance see § 86.001–23.’’.

(a) through (b)(1) [Reserved]. For guidance see § 86.098–23.

(b)(2) [Reserved]. For guidance see § 86.001–23.

(b)(3) and (b)(4) [Reserved]. For guidance see § 86.098–23.

(c) *Emission data.*—(1) *Certification vehicles.* The manufacturer shall submit emission data (including, methane, methanol, formaldehyde, and hydrocarbon equivalent, as applicable) on such vehicles tested in accordance with applicable test procedures and in such numbers as specified. These data shall include zero-mile data, if generated, and emission data generated for certification as required under § 86.000–26(a)(3). In lieu of providing emission data the Administrator may, on request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with certain applicable emission standards of this part. Standards eligible for such manufacturer requests are those for idle CO emissions, smoke emissions, or particulate emissions from methanol-fueled or gaseous-fueled diesel-cycle certification vehicles, those for particulate emissions from Otto-cycle certification vehicles or gaseous-fueled vehicles, and those for formaldehyde emissions from petroleum-fueled vehicles. Also eligible for such requests are standards for total hydrocarbon emissions from model year 1994 and later certification vehicles. By separate request, including appropriate supporting test data, the manufacturer may request that the Administrator also waive the requirement to measure particulate or formaldehyde emissions when conducting Selective Enforcement Audit testing of Otto-cycle vehicles.

(2) *Certification engines.* The manufacturer shall submit emission data on such engines tested in accordance with applicable emission test procedures of this subpart and in such numbers as specified. These data shall include zero-hour data, if generated, and emission data generated for certification as required under § 86.000–26(c)(4). In lieu of providing emission data on idle CO emissions or particulate emissions from methanol-fueled or gaseous-fueled diesel-cycle certification engines, on particulate emissions from Otto-cycle engines, or on CO emissions from diesel-cycle certification engines, the Administrator may, on request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with the applicable emission standards of this part. In lieu of providing emission data on smoke emissions from methanol-fueled or petroleum-fueled diesel certification engines, the Administrator may, on the request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with the applicable emissions standards of this part. In lieu of providing emissions data on smoke emissions from diesel-cycle engines when conducting Selective Enforcement Audit testing under subpart K of this part, the Administrator may, on separate request of the manufacturer, allow the manufacturer to demonstrate (on the basis of previous emission tests, development tests, or other information) that the engine will conform with the applicable smoke emissions standards of this part .

(d) through (e)(1) [Reserved]. For guidance see § 86.098–23.

(e)(2) and (e)(3) [Reserved]. For guidance see § 86.001–23.

(f) through (g) [Reserved]. For guidance see § 86.095–23.

(h) through (k) [Reserved]. For guidance see § 86.098–23.

(l) [Reserved]. For guidance see § 86.095–23.

(m) [Reserved]. For guidance see § 86.098–23.

21. A new § 86.007–25 is added to Subpart A to read as follows:

§ 86.007–25 Maintenance.

Section 86.007–25 includes text that specifies requirements that differ from § 86.094–25, § 86.098–25, or § 86.004–25. Where a paragraph in § 86.094–25, § 86.098–25, or § 86.004–25 is identical and applicable to § 86.007–25, this may be indicated by specifying the corresponding paragraph and the statement ‘‘[Reserved]. For guidance see § 86.094–25.’’, ‘‘[Reserved]. For guidance see § 86.098–25.’’, or ‘‘[Reserved]. For guidance see § 86.004–25.’’.

(a) through (a)(2) [Reserved]. For guidance see § 86.004–25.

(b) introductory text through (b)(3)(ii) [Reserved]. For guidance see § 86.094–25.

(b)(3)(iii) through (b)(3)(v)(H) [Reserved]. For guidance see § 86.004–25.

(b)(3)(vi)(A) through (b)(3)(vi)(D) [Reserved]. For guidance see § 86.094–25.

(b)(3)(vi)(E) through (b)(3)(vi)(J) [Reserved]. For guidance see § 86.098–25.

(b)(4) introductory text through (b)(4)(iii)(C) [Reserved]. For guidance see § 86.004–25.

(b)(4)(iii)(D) Particulate trap or trap oxidizer systems including related components (adjustment and cleaning only for filter element, replacement of the filter element is not allowed during the useful life).

(b)(4)(iii)(E) [Reserved]. For guidance see § 86.004–25.

(F) Catalytic converter (adjustment and cleaning only for catalyst beds, replacement of the bed is not allowed during the useful life).

(b)(4)(iii)(G) through (b)(6) [Reserved]. For guidance see § 86.004–25.

(b)(7) through (h) [Reserved]. For guidance see § 86.094–25.

(i) Notwithstanding the provisions of § 86.004–25(b)(4)(iii) introductory text through (b)(4)(iii)(C), paragraph (b)(4)(iii)(D) of this section, § 86.004–25(b)(4)(iii)(E), paragraph (b)(4)(iii)(F) of this section, § 86.004–25(b)(4)(iii)(G), and § 86.004–25(b)(6), manufacturers of heavy-duty engines may schedule replacement or repair of particulate trap (or trap oxidizer) systems or catalytic converters (including NO_X adsorbers), provided:

(1) The manufacturer demonstrates to the Administrator's satisfaction that the repair or replacement will be performed according to the schedule; and

(2) The manufacturer pays for the repair or replacement.

22. A new § 86.007–35 is added to Subpart A to read as follows:

§ 86.007–35 Labeling.

Section 86.007–35 includes text that specifies requirements that differ from § 86.095–35. Where a paragraph in § 86.095–35 is identical and applicable to § 86.007–35, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.095–35.''.

(a) Introductory text through (a)(1)(iii)(L) [Reserved]. For guidance see § 86.095–35.

(a)(1)(iii)(M) [Reserved.]

(a)(1)(iii)(N)(*1*) For vehicles exempted from compliance with certain revised performance warranty procedures, as specified in § 86.096–21(j), a statement indicating the specific performance warranty test(s) of 40 CFR part 85, subpart W, not to be performed.

(*2*) For vehicles exempted from compliance with all revised performance warranty procedures, as specified in § 86.096–21(k), a statement indicating:

(*i*) That none of the performance warranty tests of 40 CFR part 85, subpart W, is to be performed; and

(*ii*) The name of the Administrator-approved alternative test procedure to be performed.

(2) Light-duty truck and heavy-duty vehicles optionally certified in accordance with the light-duty truck provisions.

(i) A legible, permanent label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label:

(A) The label heading: Important Vehicle Information;

(B) Full corporate name and trademark of the manufacturer;

(C) Engine displacement (in cubic inches or liters), engine family identification, and evaporative/refueling family;

(a)(2)(iii)(D) through (a)(2)(iii)(E) [Reserved]. For guidance see § 86.095–35.

(a)(2)(iii)(F) [Reserved]

(a)(2)(iii)(G) through (a)(2)(iii)(K) [Reserved]. For guidance see § 86.095–35.

(a)(2)(iii)(L) [Reserved]

(a)(2)(iii)(M) through (a)(2)(iii)(N) [Reserved]. For guidance see § 86.095–35.

(a)(2)(iii)(O)(l) For vehicles exempted from compliance with certain revised performance warranty procedures, as specified in § 86.096–21(j), a statement indicating the specific performance warranty test(s) of 40 CFR part 85, subpart W, not to be performed.

(*2*) For vehicles exempted from compliance with all revised performance warranty procedures, as specified in § 86.096–21(k), a statement indicating:

(*i*) That none of the performance warranty tests of 40 CFR part 85, subpart W, is to be performed, and

(*ii*) The name of the Administrator-approved alternative test procedure to be performed.

(a)(3) heading through (b) [Reserved]. For guidance see § 86.095–35.

(c) Model year 2007 and later diesel-fueled vehicles must include permanent readily visible labels on the dashboard (or instrument panel) and near all fuel inlets that state ''Use Low-Sulfur Diesel Fuel Only'' or ''Low-Sulfur Diesel Fuel Only''.

(d) through (i) [Reserved]. For guidance see § 86.095–35.

23. A new § 86.007–38 is added to Subpart A to read as follows:

§ 86.007–38 Maintenance instructions.

Section 86.007–38 includes text that specifies requirements that differ from those specified in § 86.094–38 or § 86.004–38. Where a paragraph in § 86.094–38 or § 86.004–38 is identical and applicable to § 86.007–38, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.094–38.'', or ''[Reserved]. For guidance see § 86.004–38.''.

(a) through (f) [Reserved]. For guidance see § 86.004–38.

(g) [Reserved]. For guidance see § 86.094–38.

(h) [Reserved]. For guidance see § 86.004–38.

(i) For each new diesel-fueled engine subject to the standards prescribed in § 86.007–11, as applicable, the manufacturer shall furnish or cause to be furnished to the ultimate purchaser a statement that ''This engine must be operated only with low sulfur diesel fuel (that is, diesel fuel meeting EPA specifications for highway diesel fuel, including a 15 ppm sulfur cap).''

24. A new § 86.008–10 is added to subpart A to read as follows:

§ 86.008–10 Emission standards for 2008 and later model year Otto-cycle heavy-duty engines and vehicles.

Section 86.008–10 includes text that specifies requirements that differ from § 86.099–10. Where a paragraph in § 86.099–10 is identical and applicable to § 86.008–10, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.099–10.''.

(a)(1) Exhaust emissions from new 2008 and later model year Otto-cycle HDEs shall not exceed:

(i)(A) *Oxides of Nitrogen* (NO_X). 0.20 grams per brake horsepower-hour (0.075 grams per megajoule).

(B) A manufacturer may elect to include any or all of its Otto-cycle HDE families in any or all of the NO_X and NO_X plus NMHC emissions ABT programs for HDEs, within the restrictions described in § 86.008–15 or § 86.004–15. If the manufacturer elects to include engine families in any of these programs, the NO_X FEL may not exceed 0.50 grams per brake horsepower-hour (0.26 grams per megajoule). This ceiling value applies whether credits for the family are derived from averaging, banking, or trading programs. The NO_X FEL cap is 0.80 for model years before 2011 for manufacturers choosing to certify to the 1.5 g/bhp-hr NO_X+NMHC standard in 2003 or 2004, in accordance with § 86.005–10(f).

(ii)(A) *Non-methane Hydrocarbons (NMHC) for engines fueled with either gasoline, natural gas, or liquefied petroleum gas.* 0.14 grams per brake horsepower-hour (0.052grams per megajoule).

(B) *Non-methane Hydrocarbon Equivalent (NMHCE) for engines fueled with methanol.* 0.14 grams per brake horsepower-hour (0.052grams per megajoule).

(C) A manufacturer may elect to include any or all of its Otto-cycle HDE families in any or all of the NMHC emissions ABT programs for HDEs, within the restrictions described in § 86.008–15 or § 86.004–15. If the manufacturer elects to include engine families in any of these programs, the NMHC FEL may not exceed 0.30 grams per brake horsepower-hour. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading programs. The NMHC FEL cap is 0.40 for model years before 2011 for manufacturers choosing to certify to the 1.5 g/bhp-hr NO_X+NMHC in 2004, as allowed in § 86.005–10.

(iii)(A) *Carbon monoxide.* 14.4 grams per brake horsepower-hour (5.36 grams per megajoule).

(B) *Idle Carbon Monoxide.* For all Otto-cycle HDEs utilizing aftertreatment technology, and not certified to the onboard diagnostics requirements of § 86.005–17: 0.50 percent of exhaust gas flow at curb idle.

(iv) *Particulate.* 0.01grams per brake horsepower-hour (0.0037grams per megajoule).

(2) The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over the operating schedule set forth in paragraph (f)(1) of appendix I to this part, and measured and calculated in accordance with the procedures set forth in subpart N or P of this part.

(3) [Reserved]

(4) [Reserved]

(b) Evaporative emissions from heavy-duty vehicles shall not exceed the following standards. The standards apply equally to certification and in-use vehicles. The spitback standard also applies to newly assembled vehicles. For certification vehicles only, manufacturers may conduct testing to quantify a level of nonfuel background emissions for an individual test vehicle. Such a demonstration must include a description of the source(s) of emissions and an estimated decay rate. The demonstrated level of nonfuel background emissions may be subtracted from emission test results from certification vehicles if approved in advance by the Administrator.

(1) Hydrocarbons (for vehicles equipped with gasoline-fueled, natural gas-fueled or liquefied petroleum gas-fueled engines).

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs:

(A)(*1*) For the full three-diurnal test sequence described in § 86.1230–96, diurnal plus hot soak measurements: 1.4 grams per test.

(*2*) For the supplemental two-diurnal test sequence described in § 86.1230–96, diurnal plus hot soak measurements (gasoline-fueled vehicles only): 1.75 grams per test.

(B) Running loss test (gasoline-fueled vehicles only): 0.05 grams per mile.

(C) Fuel dispensing spitback test (gasoline-fueled vehicles only): 1.0 grams per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs:

(A)(*1*) For the full three-diurnal test sequence described in § 86.1230–96, diurnal plus hot soak measurements: 1.9 grams per test.

(*2*) For the supplemental two-diurnal test sequence described in § 86.1230–96, diurnal plus hot soak measurements (gasoline-fueled vehicles only): 2.3 grams per test.

(B) Running loss test (gasoline-fueled vehicles only): 0.05 grams per mile.

(2) Total Hydrocarbon Equivalent (for vehicles equipped with methanol-fueled engines).

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs:

(A)(*1*) For the full three-diurnal test sequence described in § 86.1230–96, diurnal plus hot soak measurements: 1.4 grams carbon per test.

(*2*) For the supplemental two-diurnal test sequence described in § 86.1230–96, diurnal plus hot soak measurements: 1.75 grams carbon per test.

(B) Running loss test: 0.05 grams carbon per mile.

(C) Fuel dispensing spitback test: 1.0 grams carbon per test.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 14,000 lbs:

(A)(*1*) For the full three-diurnal test sequence described in § 86.1230–96, diurnal plus hot soak measurements: 1.9 grams carbon per test.

(*2*) For the supplemental two-diurnal test sequence described in § 86.1230–96, diurnal plus hot soak measurements: 2.3 grams carbon per test.

(B) Running loss test: 0.05 grams carbon per mile.

(3)(i) For vehicles with a Gross Vehicle Weight Rating of up to 26,000 lbs, the standards set forth in paragraphs (b)(1) and (b)(2) of this section refer to a composite sample of evaporative emissions collected under the conditions and measured in accordance with the procedures set forth in subpart M of this part.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs., the standards set forth in paragraphs (b)(1)(ii) and (b)(2)(ii) of this section refer to the manufacturer's engineering design evaluation using good engineering practice (a statement of which is required in § 86.098–23(b)(4)(ii)).

(4) All fuel vapor generated in a gasoline- or methanol-fueled heavy-duty vehicle during in-use operations shall be routed exclusively to the evaporative control system (e.g., either canister or engine purge). The only exception to this requirement shall be for emergencies.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 2008 or later model year Otto-cycle HDE.

(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 N or P of this part to ascertain that such test engines meet the requirements of this section.

(e) [Reserved]. For guidance see § 86.099–10.

(f) Phase-in options. (1)(i) For model year 2008, manufacturers may certify some of their engine families to the exhaust standards applicable to model year 2007 engines under § 86.005–10, in lieu of the exhaust standards specified in this section. These engines must comply with all other requirements applicable to model year 2008 engines, except as allowed by paragraph (f)(1)(ii) of this section. The combined number of engines in the engine families certified to the 2007 combined NO_X plus NMHC standard may not exceed 50 percent of the manufacturer's U.S.-directed production of heavy-duty Otto-cycle motor vehicle engines for model year 2008, except as explicitly allowed by paragraph (f)(2) of this section.

(ii) For model year 2008, manufacturers may certify some of their engine families to the evaporative standards applicable to model year 2007 engines under § 86.005–10, in lieu of the standards specified in this section.

These engines must comply with all other requirements applicable to model year 2008 engines, except as allowed by paragraph (f)(1)(i) of this section. The combined number of engines in the engine families certified to the 2007 standards may not exceed 50 percent of the manufacturer's U.S.-directed production of heavy-duty Otto-cycle motor vehicle engines for model year 2008.

(2)(i) Manufacturers certifying engines to all of the applicable exhaust standards listed in paragraph (a) of this section prior to model year 2008 (without using credits) may reduce the number of engines that are required to meet the NO_X and NMHC exhaust standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (f)(1) of this section. For every engine that is certified early, the manufacturer may reduce the number of engines that are required by paragraph (f)(1) of this section to meet the NO_X and NMHC standards listed in paragraph (a) of this section by one engine. For example, if a manufacturer produces 100 heavy-duty Otto-cycle engines in 2007 that meet all of the applicable standards listed in paragraph (a) of this section, and it produced 10,000 heavy-duty Otto-cycle engines in 2009, then only 9,900 of the engines would need to comply with the NO_X and NMHC standards listed in paragraph (a) of this section.

(ii) Manufacturers certifying engines to all of the applicable evaporative standards listed in paragraph (b) of this section prior to model year 2008 may reduce the number of engines that are required to meet the evaporative standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (f)(1) of this section. For every engine that is certified early, the manufacturer may reduce the number of engines that are required by paragraph (f)(1) of this section to meet evaporative standards listed in paragraph (b) of this section by one engine.

(3) Manufacturers certifying engines to a voluntary NO_X standard of 0.10 g/bhp-hr (without using credits) in addition to all of the applicable standards listed in paragraphs (a) and (b) of this section prior to model year 2008 may reduce the number of engines that are required to meet the NO_X and NMHC standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (f)(1) of this section. For such every engine that is certified early, the manufacturer may reduce the number of engines that are required by paragraph (f)(1) of this section to meet the NO_X and NMHC standards listed in paragraph (a) of this section by two engines.

(g) For model years prior to 2012, for purposes of determining compliance after title or custody has transferred to the ultimate purchaser, for engines having a NO_X FEL no higher than 0.50 g/bhp-hr, the applicable compliance limits for NO_X and NMHC shall be determined by adding 0.10 g/bhp-hr to the otherwise applicable standards or FELs for NO_X and NMHC.

25. A new § 86.113–07 is added to subpart B to read as follows:

§ 86.113–07 Fuel specifications.

Section 86.113–07 includes text that specifies requirements that differ from § 86.113–94 or § 86.113–04. Where a paragraph in § 86.113–94 or § 86.113–04 is identical and applicable to § 86.113–07, this may be indicated by specifying the corresponding paragraph and the statement "[Reserved]. For guidance see § 86.113–94." or "[Reserved]. For guidance see § 86.113–04.".

(a) [Reserved]. For guidance see § 86.113–04.

(b)(1) [Reserved]. For guidance see § 86.113–94.

(b)(2) Petroleum fuel for diesel vehicles meeting the following specifications, or substantially equivalent specifications approved by the Administrator, must be used in exhaust emissions testing. The grade of petroleum diesel fuel recommended by the engine manufacturer, commercially designated as "Type 2–D" grade diesel, must be used:

Item		ASTM test method No.	Type 2–D
(i) Cetane Number		D613	40–50
(ii) Cetane Index		D976	40–50
(iii) Distillation range:			
(A) IBP	°F	D86	340–400
	(°C)		(171.1–204.4)
(B) 10 pct. point	°F	D86	400–460
	(°C)		(204.4–237.8)
(C) 50 pct. point	°F	D86	470–540
	(°C)		(243.3–282.2)
(D) 90 pct. point	°F	D86	560–630
	(°C)		(293.3–332.2)
(E) EP	°F	D86	610–690
	(°C)		(321.1–365.6)
(iv) Gravity	°API	D287	32–37
(v) Total sulfur	ppm	D2622	7–15
(vi) Hydrocarbon composition:			
(A) Aromatics, minimum (Remainder shall be paraffins, naphthenes, and olefins)	pct.	D5186	27
(vii) Flashpoint, min.	°F	D93	130
	(°C)		(54.4)
(viii) Viscosity	centistokes	D445	2.0–3.2

(3) Petroleum fuel for diesel vehicles meeting the following specifications, or substantially equivalent specifications approved by the Administrator, shall be used in service accumulation. The grade of petroleum diesel fuel recommended by the engine manufacturer, commercially designated as "Type 2-D" grade diesel fuel, shall be used: (b)(4) through (g) [Reserved]. For guidance see § 86.113–94.

Item		ASTM test method No.	Type 2–D
(i) Cetane Number		D613	38–58

Item		ASTM test method No.	Type 2–D
(ii) Cetane Index		D976	min. 40
(iii) Distillation range:			
90 pct. point	°F	D86	540–630
(iv) Gravity	°API	D287	30–39
(v) Total sulfur	ppm	D2622	7–15
(vi) Flashpoint, min.	°F	D93	130
	(°C)		(54.4)
(vii) Viscosity	centistokes	D445	1.5–4.5

(h)(1) For model year 2004 through 2006 Tier 2 diesel-fueled vehicles that incorporate sulfur-sensitive technologies, the manufacturer may test the vehicle using a test fuel meeting the specifications listed in paragraphs (b)(2) and (b)(3) of this section, provided the manufacturer clearly recommends to the ultimate purchaser in the owner's manual that the vehicle should use fuel with no higher than 15 ppm sulfur.

(2) For model year 2004 through 2006 Tier 2 diesel-fueled vehicles that incorporate sulfur-sensitive technologies and that are certified for 50-state sale (*i.e.,* certified to California and EPA standards), the manufacturer may test the vehicle using a test fuel whose qualities, on a specification by specification basis, meet the requirements of either the specifications listed in paragraph (b)(2) of this section or the California test fuel specifications, provided the manufacturer clearly recommends to the ultimate purchaser in the owner's manual that the vehicle should use fuel with no higher than 15 ppm sulfur.

(3) Where a manufacturer uses a test fuel under paragraph (h)(1) or (h)(2) of this section, EPA shall use the same fuel for its compliance testing.

26. A new § 86.1213–04 is added to Subpart M to read as follows:

§ 86.1213–04 Fuel specifications.

The test fuels listed in § 86.1313–04 shall be used for evaporative emission testing.

27. A new § 86.1306–07 is added to subpart N to read as follows:

§ 86.1306–07 Equipment required and specifications; overview.

Section 86.1306–07 includes text that specifies requirements that differ from § 86.1306–96. Where a paragraph in § 86.1306–96 is identical and applicable to § 86.1306–07, this may be indicated by specifying the corresponding paragraph and the statement "[Reserved]. For guidance see § 86.1306–96.".

(a) and (b) [Reserved]. For guidance see § 86.1306–96.

(c)(1) Upon request, the Administrator may allow a manufacturer to use some of the test equipment allowed for model year 2006 and earlier engines instead of the test equipment required for model year 2007 and later engines, provided that good engineering judgment indicates that it would not adversely affect determination of compliance with the applicable emission standards of this part.

(2) A manufacturer may use the test equipment required for model year 2007 and later engines for earlier model year engines, provided that good engineering judgment indicates that it would not adversely affect determination of compliance with the applicable emission standards of this part.

(d) Approval of alternate test system. (1) If on the basis of the information described in paragraph (d)(5) of this section, the Administrator determines that an alternate test system would consistently and reliably produce emission test results that are at least equivalent to the results produced using the test systems described in this subpart, he/she shall approve the alternate system for optional use instead of the test systems described in this subpart.

(2) Any person may submit an application for approval of an alternate test system.

(3) In approving an alternate test system, the Administrator may approve it for general use, or may approve it conditionally.

(4) The Administrator may revoke the approval on the basis of new information that indicates that the alternate test system is not equivalent. However, revocation of approval must allow manufacturers sufficient lead-time to change the test system to an approved system. In determining the amount of lead-time that is required, the Administrator will consider relevant factors such as:

(i) The ease with which the test system can be converted to an approved system.

(ii) The degree to which the alternate system affects the measured emission rates.

(iii) Any relevant conditions included in the approval.

(5) The application for approval must include:

(i) *An explanation of the theoretical basis of the alternate system.* This technical description should explain why the detection principle of the alternate system would provide equivalent results to the detection principle of the prescribed system for the full range of emission properties being measured. This description may include equations, figures, and references. For example, a NO_X measurement application should theoretically relate the alternate detection principle to the chemiluminescent detection principle of detecting nitric oxide for a typical range of NO to NO_2 ratios. A PM measurement application should explain the principle(s) by which the alternate system quantifies PM mass independent of PM composition, and how it is impacted by semi-volatile and volatile species= phase distributions. For any proportioning or integrating system, the application should compare the alternate system's theoretical response to the prescribed system's response.

(ii) *A technical description of the alternate system.* This section shall detail all of the hardware and software included in the alternate system. Dimensioned drawings, flow-charts, schematics, and component specifications shall be included. Any data manipulation (*i.e.* calculations) that the system performs shall be presented in this section.

(iii) *A description of the procedures used to operate the system including the level of training that an operator must have to achieve acceptable results.* This section of the application shall describe all of the installation, calibration, operation, and maintenance procedures in a step-by-step format. Note that empirical calibration with respect to another prescribed or approved measurement system is not acceptable. Calibration should be performed with NIST traceable standards, or equivalent national standards. Diagrams, schematics, and other graphics may be used to enhance the description.

(iv) *A comparison of results from the alternate system and from the prescribed system (or other system approved by the Administrator).* The two systems must be calibrated independently to NIST traceable standards or equivalent national standards for this comparison. While other statistical analyses may be acceptable, it is recommended that the comparison be based on a minimum of 7 collocated and simultaneous tests. This comparison shall be performed over the ''hot-start'' portion of the FTP test cycle. If the comparison is paired, it must demonstrate that the alternate system passes a two-sided, paired t-test described in this paragraph. If the test is unpaired, it must demonstrate that the alternate system passes a two-sided, unpaired t-test described in this paragraph. Other statistical criteria may be set by the Administrator. The average of these tests for the reference system must return results less than or equal to the applicable emissions standard. The t-test is performed as follows, where ''n'' equals the number of tests:

(A) Calculate the average of the alternate system results; this is A_{avg}.

(B) Calculate the average of the results of the system to which the alternate system was referenced; this is R_{avg}.

(C) For an unpaired comparison, calculate the ''n − 1'' standard deviation for the alternate and reference averages; these are A_{sd} and R_{sd} respectively. A_{sd} must be less than or equal to R_{sd}. If A_{sd} is greater than R_{sd}, the Administrator will not approve the application.

(D) For an unpaired comparison, calculate the t-value:

$t_{unpaired} = (A_{avg} - R_{avg})/((A_{sd}^2+R_{sd}^2)/n)^{1/2}$

(E) For a paired comparison, calculate the ''n − 1'' standard deviation (squared) of the differences, d_i, between the paired results, where ''i'' represents the i^{th} test of n number of tests:

$S_D^2 = (Sd_i^2 - ((Sd_i)^2/n))/(n - 1)$

(F)(*1*) For a paired comparison, calculate the t-value:

$t_{paired} = (A_{avg} - R_{avg})/(S_D^2/n)^{1/2}$

(*2*) The absolute value of t must be less than the critical t value, t_{crit} at a 90% confidence interval for ''n − 1'' degrees of freedom. The following table lists 90% confidence interval t_{crit} values for n − 1 degrees of freedom:

90% Confidence interval critical t values vs. n − 1 degrees of freedom for a two-sided, paired t − test

n − 1	t_{crit}
6	1.94
7	1.89
8	1.86
9	1.83
10	1.81
11	1.80
12	1.78
13	1.77
14	1.76
15	1.75
16	1.75
17	1.74
18	1.73
19	1.73
20	1.72

28. Section 86.1309–90 is amended by revising the section heading and paragraph (a)(1) to read as follows:

§ 86.1309–90 Exhaust gas sampling system; Otto-cycle and non-petroleum-fueled engines.

(a)(1) *General.* The exhaust gas sampling system described in this paragraph is designed to measure the true mass of gaseous emissions in the exhaust of either gasoline-fueled, natural gas-fueled, liquefied petroleum gas-fueled or methanol-fueled engines. In the CVS concept of measuring mass emissions, two conditions must be satisfied; the total volume of the mixture of exhaust and dilution air must be measured, and a continuously proportioned volume of sample must be collected for analysis. Mass emissions are determined from the sample concentration and total flow over the test period.

* * * * *

29. A new section 86.1310–07 is added to Subpart N to read as follows:

§ 86.1310–2007 Exhaust gas sampling and analytical system for gaseous emissions from heavy-duty diesel-fueled engines and particulate emissions from all engines.

(a) *General.* The exhaust gas sampling system described in this paragraph is designed to measure the true mass of both gaseous and particulate emissions in the exhaust of heavy-duty diesel engines, and particulate emissions in the exhaust of all heavy-duty engines. (Gaseous emissions from non-petroleum-fueled diesel engines are measured using the system described in § 86.1309.) This system utilizes the CVS concept (described in § 86.1309) of measuring the combined mass emissions of THC, NO_X, CH_4 (if applicable) CO, CO_2 and particulate matter. For all emission measurement systems described in this section, multiple or redundant systems may be used during a single test. Statistical averages of data from multiple systems may be used to calculate test results, consistent with good engineering judgment. Weighted averages are allowed, where appropriate Statistical outliers may be discarded, but all results must be reported. If the Administrator determines that the statistical analysis is not consistent with good engineering judgment, he/she may determine compliance from the arithmetic mean of the results. A continuously integrated system may be used for THC, NO_X , CO and CO_2 measurement. The use of proportional bag sampling for sample integration is allowed for THC, NO_X, CO, and CO_2 measurement, but requirements specific to bag sampling from diesel exhaust must be met for the THC and NO_X emissions measurements. CH_4 measurement for calculation of NMHC (if applicable) is measured using GC–FID analysis of a proportional bag sample. The mass of gaseous emissions is determined from the sample concentration and total flow over the test period. The mass of particulate emissions is determined from a proportional mass sample collected on a filter and from the sample flow and total flow over the test period. As an option, the measurement of total fuel mass consumed over a cycle may be substituted for the exhaust measurement of CO_2. General requirements are as follows:

(1) This sampling system requires the use of a CVS The CVS system may use a PDP or a CFV. PDP systems must use a heat exchanger. CFV systems may use either a heat exchanger or electronic flow compensation. When electronic flow compensation is used, the CFV may be replaced by a subsonic venturi (SSV) as long as the CVS concept as defined in § 86.1309 is maintained (i.e., a constant volumetric flow-rate through the CVS is maintained for the duration of the test). Figure N07–1 is a schematic drawing of the CVS system.

(2) The THC analytical system for diesel engines requires a heated flame ionization detector (HFID) and heated sample system (191 ± 11 °C) using either:

(i) Continuously integrated measurement of diluted THC meeting the minimum requirements and technical specifications contained in paragraph (b)(3) of this section. Unless compensation for varying mass flow is made, a constant mass flow system must be used to ensure a proportional sample; or

(ii) Heated (191 ± 11 °C) proportional bag sampling systems for hydrocarbon measurement will be allowed if the bag sampling system meets the performance specifications for outgassing and permeability as defined in paragraph (b)(2) of this section.

(3) CH_4 measurement, if applicable, shall be conducted using a proportional bag sampling system with subsequent analysis using a gas chromatograph and FID. The CH_4 measurement shall be done in accordance with SAE Recommended Practice J1151, ''Methane Measurement Using Gas Chromatography'' (1994 SAE Handbook, Volume 1: Materials, Fuels, Emissions, and Noise, Section 13, Page 13.170), which is incorporated by reference pursuant to § 86.1(b)(2). As an alternative, the manufacturer may choose one of the options set forth in § 86.004–28(c)(8).

(4) [Reserved]

(5) [Reserved]

(6) The CO and CO_2 analytical system requires:

(i) Bag sampling (§ 86.1309) and analytical (§ 86.1311) capabilities, as shown in Figure N07–1; or

(ii) Continuously integrated measurement of diluted CO and CO_2 meeting the minimum requirements and technical specifications contained in paragraph (b)(5) of this section. Unless compensation for varying flow is made, a constant flow system must be used to ensure a proportional sample; and

(7) The NO_X analytical system requires:

(i) Continuously integrated measurement of diluted NO_X meeting the minimum requirements and technical specifications contained in paragraph (b)(5) of this section. Unless compensation for varying flow is made, a constant flow system must be used to ensure a proportional sample.

(ii) Bag sampling (§ 86.1309) and analytical (§ 86.1311) capabilities, as shown in Figure N07–1 (or Figure 07–2) will be allowed provided that sample gas temperature is maintained above the sample's aqueous dewpoint at all times during collection and analysis.

(8) The mass of particulate in the exhaust is determined via filtration. The particulate sampling system requires dilution of the exhaust to a temperature of 47 °C ± 5 °C, measured upstream of a single high-efficiency sample filter (as close to the filter as practical).

(9) Since various configurations can produce equivalent results, exact conformance with these drawings is not required. Additional components such as instruments, valves, solenoids, pumps, and switches may be used to provide additional information and coordinate the functions of the components of the system. Other components, such as snubbers, which are not needed to maintain accuracy on some systems, may be excluded if their exclusion is based upon good engineering judgment.

(10) Other sampling and/or analytical systems may be used if shown to yield equivalent results and if approved in advance by the Administrator (see § 86.1306–07).

(b) *Component description.* The components necessary for exhaust sampling shall meet the following requirements:

(1) *Exhaust dilution system.* The CVS shall conform to all of the requirements listed for the exhaust gas CVS systems in § 86.1309(b), (c), and (d). With respect to PM measurement, the intent of this measurement procedure is to perform the sample cooling primarily via dilution and mixing with air rather than via heat transfer to the surfaces of the sampling system. In addition the CVS must conform to the following requirements:

(i) The flow capacity of the CVS must be sufficient to maintain the diluted exhaust stream at the temperatures required for the measurement of particulate and hydrocarbon emission noted below and at, or above, the temperatures where aqueous condensation in the exhaust gases could occur. This is achieved by the following method. The flow capacity of the CVS must be sufficient to maintain the diluted exhaust stream in the primary dilution tunnel at a temperature of 191 °C or less at the sampling zone and as required to prevent condensation at any point in the dilution tunnel. Gaseous emission samples may be taken directly from this sampling point. An exhaust sample must then be taken at this point to be diluted a second time for use in determining particulate emissions. The secondary dilution system must provide sufficient secondary dilution air to maintain the double-diluted exhaust stream at a temperature of 47 C ± 5 C, measured at a point located between the filter face and 16 cm upstream of the filter face.

(ii) For the CVS , either a heat exchanger (*i.e.* CFV–CVS) or electronic flow compensation (*i.e.* EFC–CFV–CVS), which also includes the particulate sample flows is required Refer to Figure N07–1.

(iii) When a heat exchanger is used, the gas mixture temperature, measured at a point immediately ahead of the critical flow venturi, shall be within ±11 °C of the average operating temperature observed during the test with the simultaneous requirement that aqueous condensation does not occur. The temperature measuring system (sensors and readout) shall have an accuracy and precision of ±1.9 °C. For systems utilizing a flow compensator to maintain proportional sampling, the requirement for maintaining constant temperature is not necessary.

(iv) The primary dilution air and secondary dilution air:

(A) Shall have a primary and secondary dilution air temperature equal to or greater than 15 °C.

(B) Primary dilution air shall be filtered at the dilution air inlet. The manufacturer of the primary dilution air filter shall state that the filter design has successfully achieved a minimum particle removal efficiency of 98% (less than 0.02 penetration) as determined using ASTM test method F 1471–93 (incorporated by reference at section 86.1). Secondary dilution air shall be filtered at the dilution air inlet using a high-efficiency particulate air filter (HEPA). The HEPA filter manufacturer shall state the HEPA filter design has successfully achieved a minimum particle removal efficiency of 99.97% (less than 0.0003 penetration) as determined using ASTM test method F 1471–93. It is recommended that the primary dilution air be filtered using a HEPA filter. EPA intends to utilize HEPA filters to condition primary dilution air in its test facilities. It is acceptable to use of a booster blower upstream or downstream of a HEPA filter in the primary dilution tunnel (and upstream of the introduction of engine exhaust into the CVS) to compensate for the additional pressure loss associated with the filter. The design of any booster blower located downstream of the filter should minimize the introduction of additional particulate matter into the CVS.

(C) Primary dilution air may be sampled to determine background particulate levels, which can then be subtracted from the values measured in the diluted exhaust stream. In the case of primary dilution air, the background particulate filter sample shall be taken immediately downstream of the dilution air filter and upstream of the engine exhaust flow (Figure N07–1). The provisions of paragraphs (b)(7) of this section, and of § 86.1312–2007 also apply to the measurement of background particulate matter, except that the filter temperature must be maintained below 52 °C.

(2) *Heated proportional bag sampling systems.* If a heated (191 ± 11 °C) proportional bag sampling system is used for THC measurement, sample bags must demonstrate minimal outgassing and permeability by passing the following performance test:

(i) Performance test for sample bag HC outgassing and CO_2 permeability. Bring the bag system to its operational temperature. Fill the heated sample bag with a nominal mixture of 1% CO_2 in

N_2. Perform an initial measurement of CO_2 and THC from the sample bag, and repeat the measurement after one hour. Acceptable performance criteria are <2% decrease of the initial CO_2 reading and <1 ppmC THC.

(ii) [Reserved]

(3) *Continuous HC measurement system.* (i) The continuous HC sample system (as shown in Figure N07–1) uses an ''overflow'' zero and span system. In this type of system, excess zero or span gas spills out of the probe when zero and span checks of the analyzer are made. The ''overflow'' system may also be used to calibrate the HC analyzer per § 86.1321(b), although this is not required.

(ii) No other analyzers may draw a sample from the continuous HC sample probe, line or system, unless a common sample pump is used for all analyzers and the sample line system design reflects good engineering practice.

(iii) The overflow gas flow rates into the sample line shall be at least 105% of the sample system flow rate.

(iv) The overflow gases shall enter the heated sample line as close as practicable to the outside surface of the CVS duct or dilution tunnel.

(v) The continuous HC sampling system shall consist of a probe (which must raise the sample to the specified temperature) and, where used, a sample transfer system (which must maintain the specified temperature). The continuous hydrocarbon sampling system (exclusive of the probe) shall:

(A) Maintain a wall temperature of 191°C ± 11°C as measured at every separately controlled heated component (*i.e.*, filters, heated line sections), using permanent thermocouples located at each of the separate components.

(B) Have a wall temperature of 191°C ± 11°C over its entire length. The temperature of the system shall be demonstrated by profiling the thermal characteristics of the system at initial installation and after any major maintenance performed on the system. The temperature profile of the HC sampling system shall be demonstrated by inserting thermocouple wires (typically Teflon™ coated for ease of insertion) into the sampling system assembled in-situ where possible, using good engineering judgment. The wire should be inserted up to the HFID inlet. Stabilize the sampling system heaters at normal operating temperatures. Withdraw the wires in increments of 5 cm to 10 cm (2 inches to 4 inches) including all fittings. Record the stabilized temperature at each position. The system temperature will be monitored during testing at the locations and temperature described in § 86.1310–90(b)(3)(v)(A).

Note: It is understood that profiling of the sample line can be done under flowing conditions also as required with the probe. This test may be cumbersome if test facilities utilize long transfer lines and many fittings; therefore it is recommended that transfer lines be kept as short as possible and the use of fittings should be kept minimal.

(C) Maintain a gas temperature of 191°C ±11°C immediately before the heated filter and HFID. These gas temperatures will be determined by a temperature sensor located immediately upstream of each component.

(vi) The continuous hydrocarbon sampling probe shall:

(A) Be defined as the first 25.4 cm (10 in) to 76.2 cm (30 in) of the continuous hydrocarbon sampling system;

(B) Have a 0.483 cm (0.19 in) minimum inside diameter;

(C) Be installed in the primary dilution tunnel at a point where the dilution air and exhaust are well mixed (*i.e.*, approximately 10 tunnel diameters downstream of the point where the exhaust enters the dilution tunnel);

(D) Be sufficiently distant (radially) from other probes and the tunnel wall so as to be free from the influence of any wakes or eddies; and

(E) Increase the gas stream temperature to 191°C ± 11°C by the exit of the probe. The ability of the probe to accomplish this shall be demonstrated at typical sample flow rates using the insertion thermocouple technique at initial installation and after any major maintenance. Compliance with the temperature specification shall be demonstrated by monitoring during each test the temperature of either the gas stream or the wall of the sample probe at its terminus.

(vii) The response time of the continuous measurement system shall be no greater than:

(A) 1.5 seconds from an instantaneous step change at the port entrance to the analyzer to within 90 percent of the step change;

(B) 10 seconds from an instantaneous step change at the entrance to the sample probe or overflow span gas port to within 90 percent of the step change. Analysis system response time shall be coordinated with CVS flow fluctuations and sampling time/test cycle offsets if necessary; and

(C) For the purpose of verification of response times, the step change shall be at least 60 percent of full-scale chart deflection.

(4) *Primary-dilution tunnel.* (i) The primary dilution tunnel shall be:

(A) Small enough in diameter to cause turbulent flow (Reynolds Number greater than 4000) and of sufficient length to cause complete mixing of the exhaust and dilution air. Good engineering judgment shall dictate the use of mixing plates and mixing orifices to ensure a well-mixed sample. To verify mixing, EPA recommends flowing a tracer gas (*i.e.* propane or CO_2) from the raw exhaust inlet of the dilution tunnel and measuring its concentration at several points along the axial plane at the sample probe. Tracer gas concentrations should remain nearly constant (*i.e.* within 2%) between all of these points.

(B) At least 8 inches (20 cm) in diameter.

(C) Constructed of electrically conductive material which does not react with the exhaust components.

(D) Electrically grounded.

(E) EPA recommends that the tunnel should have minimal thermal capacitance such that the temperature of the walls tracks with the temperature of the diluted exhaust.

(ii) The temperature of the diluted exhaust stream inside of the primary dilution tunnel shall be sufficient to prevent water condensation.

(iii) The engine exhaust shall be directed downstream at the point where it is introduced into the primary dilution tunnel.

(5) *Continuously integrated NO_X, CO, and CO2 measurement systems.* (i) The sample probe shall:

(A) Be in the same plane as the continuous HC probe, but shall be sufficiently distant (radially) from other probes and the tunnel wall so as to be free from the influences of any wakes or eddies; and

(B) Heated and insulated over the entire length, to prevent water condensation, to a minimum temperature of 131°F (55° C). Sample gas temperature immediately before the first filter in the system shall be at least 131° F (55° C).

(ii) The continuous NO_X, CO, or CO2 sampling and analysis system shall conform to the specifications of subpart D of this part, with the following exceptions:

(A) The system components required to be heated by subpart D need only be heated to prevent water condensation, the minimum component temperature shall be 131° F (55° C);

(B) The system response defined in § 86.329–79 shall be no greater than 10 seconds. Analysis system response time shall be coordinated with CVS flow fluctuations and sampling time/test cycle offsets, if necessary;

(C) Alternative NO_X measurement techniques outlined in § 86.346–79 are not permitted for NO_X measurement in this subpart;

(D) All analytical gases shall conform to the specifications of § 86.1314;

(E) Any range on a linear analyzer below 100 ppm shall have and use a calibration curve conforming to § 86.1323–07; and

(F) The measurement accuracy requirements are specified in § 86.1338–07 .

(iii) The signal output of analyzers with non-linear calibration curves shall be converted to concentration values by the calibration curve(s) specified in subpart D of this part (§ 86.330–79) before flow correction (if used) and subsequent integration takes place.

(6) *Particulate sampling system.* This method collects a proportional sample from the primary tunnel, and then transfers this sample to a secondary dilution tunnel where the sample is further diluted. The double-diluted sample is then passed through the collection filter. Proportionality (i.e., mass flow ratio) between the primary tunnel flow rate and the sample flow rate must be maintained within ±5%, excluding the first 10 seconds of the test at start-up. The requirements for this system are:

(i) The particulate sample transfer tube shall be configured and installed so that:

(A) The inlet faces upstream in the primary dilution tunnel at a point where the primary dilution air and exhaust are well mixed.

(B) The particulate sample exits on the centerline of the secondary tunnel.

(ii) The entire particulate sample transfer tube shall be:

(A) Sufficiently distant (radially) from other sampling probes (in the primary dilution tunnel) so as to be free from the influence of any wakes or eddies produced by the other probes.

(B) 0.85 cm minimum inside diameter.

(C) No longer than 36 in (91 cm) from inlet plane to exit plane.

(D) Designed to minimize the diffusional and thermophoretic deposition of particulate matter during transfer (i.e., sample residence time in the transfer tube should be as short as possible, temperature gradients between the flow stream and the transfer tube wall should be minimized). Double-wall, thin-wall, air-gap insulated, or a controlled heated construction for the transfer tube is recommended.

(E) Constructed such that the surfaces exposed to the sample shall be an electrically conductive material, which does not react with the exhaust components, and this surface shall be electrically grounded so as to minimize electrostatic particulate matter deposition.

(iii) The secondary dilution air shall be at a temperature equal to or greater than 15° C.

(iv) The secondary-dilution tunnel shall be constructed such that the surfaces exposed to the sample shall be an electrically conductive material, which does not react with the exhaust components, and this surface shall be electrically grounded so as to minimize electrostatic particulate deposition.

(v) Additional dilution air must be provided so as to maintain a sample temperature of 47° C ± 5° C upstream of the sample filter. Temperature shall be measured with a thermocouple with a 3⁄16″ shank, having thermocouple wires with a gage diameter 24 AWG or smaller, a bare-wire butt-welded junction; or other suitable temperature measurement with an equivalent or faster time constant and an accuracy and precision of ± 1.9° C.

(vi) The filter holder assembly shall be located within 12.0 in (30.5 cm) of the exit of the secondary dilution tunnel.

(vii) The face velocity through the sample filter shall not exceed 100 cm/s (face velocity is defined as the standard volumetric sample flow rate (i.e., scm3/sec) divided by the sample filter stain area (i.e., cm2)).

(7) *Particulate sampling.* (i) *Filter specifications.* (A) Polytetrafluoroethylene (PTFE or Teflon™) coated borosilicate glass fiber high-efficiency filters or polytetrafluoroethylene (PTFE or Teflon™) high-efficiency membrane filters with an integral support ring of polymethylpentene (PMP) or equivalent inert material are required. Filters shall have a minimum clean filter efficiency of 99% as measured by the ASTM D2986–95a DOP test (incorporated by reference at § 86.1).

(B) Particulate filters must have a diameter of 46.50 ± 0.6 mm (38 mm minimum stain diameter).

(C) The dilute exhaust is simultaneously sampled by a single high-efficiency filter during the cold-start test and by a second high efficiency filter during the hot-start test.

(D) It is recommended that the filter loading should be maximized consistent with temperature requirements.

(ii) *Filter holder assembly.* The filter holder assembly shall comply with the specifications set forth for ambient PM measurement in 40 CFR Part 50, Appendix L 7.3.5, figures L–25 and L–26, with the following exceptions:

(A) The material shall be 302, 303, or 304 stainless steel instead of anodized aluminum.

(B) The 2.84 cm diameter entrance to the filter holder may be adapted, using sound engineering judgment and leak-free construction, to an inside diameter no smaller than 0.85 cm, maintaining the 12.5° angle from the inlet of the top filter holder to the area near the sealing surface of the top of the filter cartridge assembly. Figure N07–2 shows acceptable variation from the design in 40 CFR Part 50, Appendix L. Similar variations using sound engineering design are also acceptable provided that they provide even flow distribution across the filter media and a similar leak-free seal with the filter cartridge assembly.

(C) If additional or multiple filter cartridges are stored in a particulate sampler as part of an automatic sequential sampling capability, all such filter cartridges, unless they are installed in the sample flow (with or without flow established) shall be covered or sealed to prevent communication of semi-volatile matter from filter to filter; contamination of the filters before and after sampling; or loss of volatile or semi-volatile particulate matter after sampling.

(iii) *Filter cartridge assembly.* The filter cartridge assembly shall comply with the specifications set forth for ambient PM measurement in 40 CFR Part 50, Appendix L 7.3.5, figures L–27, L–28, and L–29, with the following exceptions:

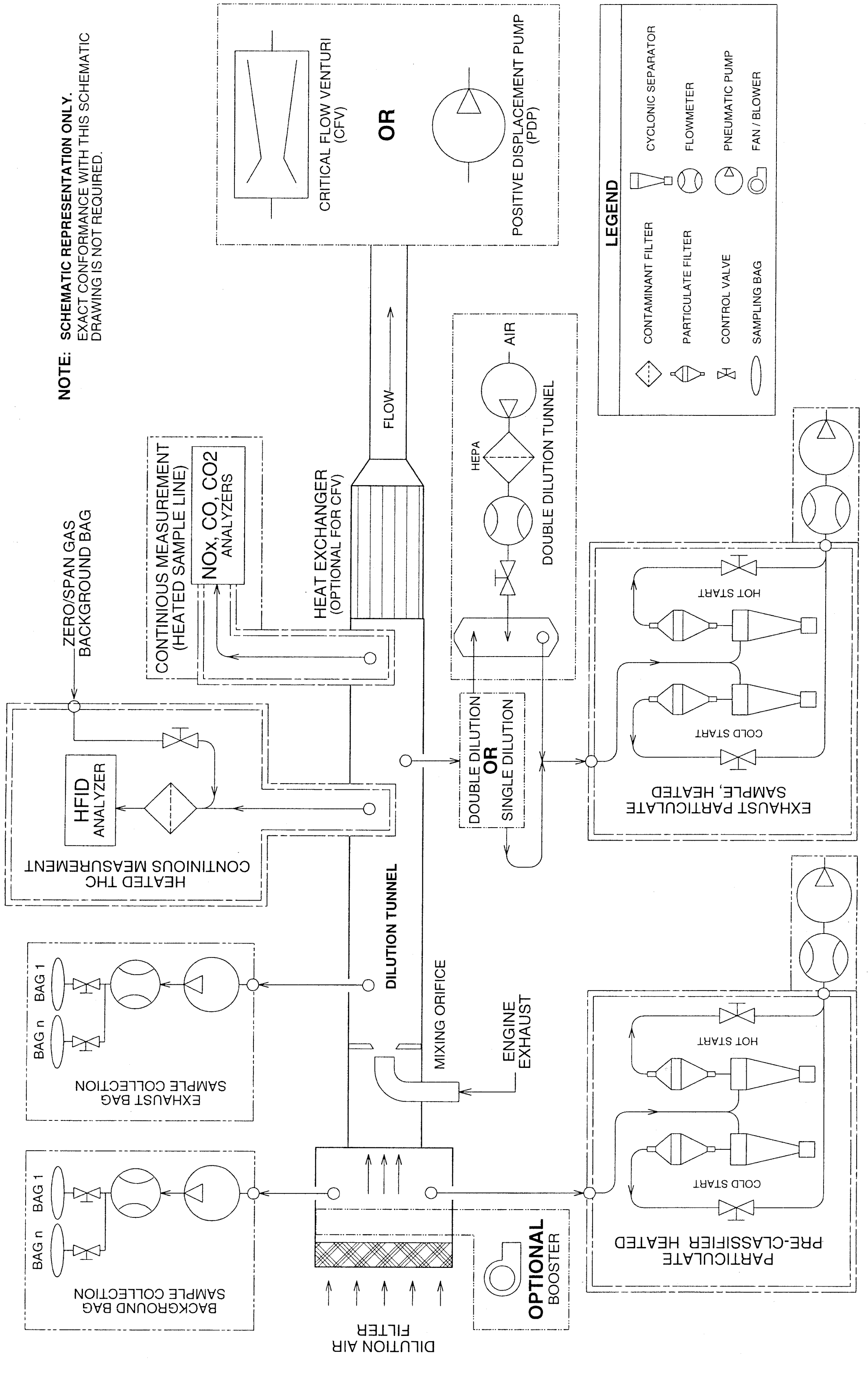
(A) In addition to the specified Delrin ™ material, 302, 303, or 304 stainless steel, polycarbonate or acrylonitrile/butadiene/styrene (ABS) resin, or a combination of these materials may also be used.

(B) A bevel introduced on the inside diameter of the entrance to the filter cartridge, as used by some commercially available automated sequential particulate filter cartridge changers, is also acceptable (see Figure N07–3).

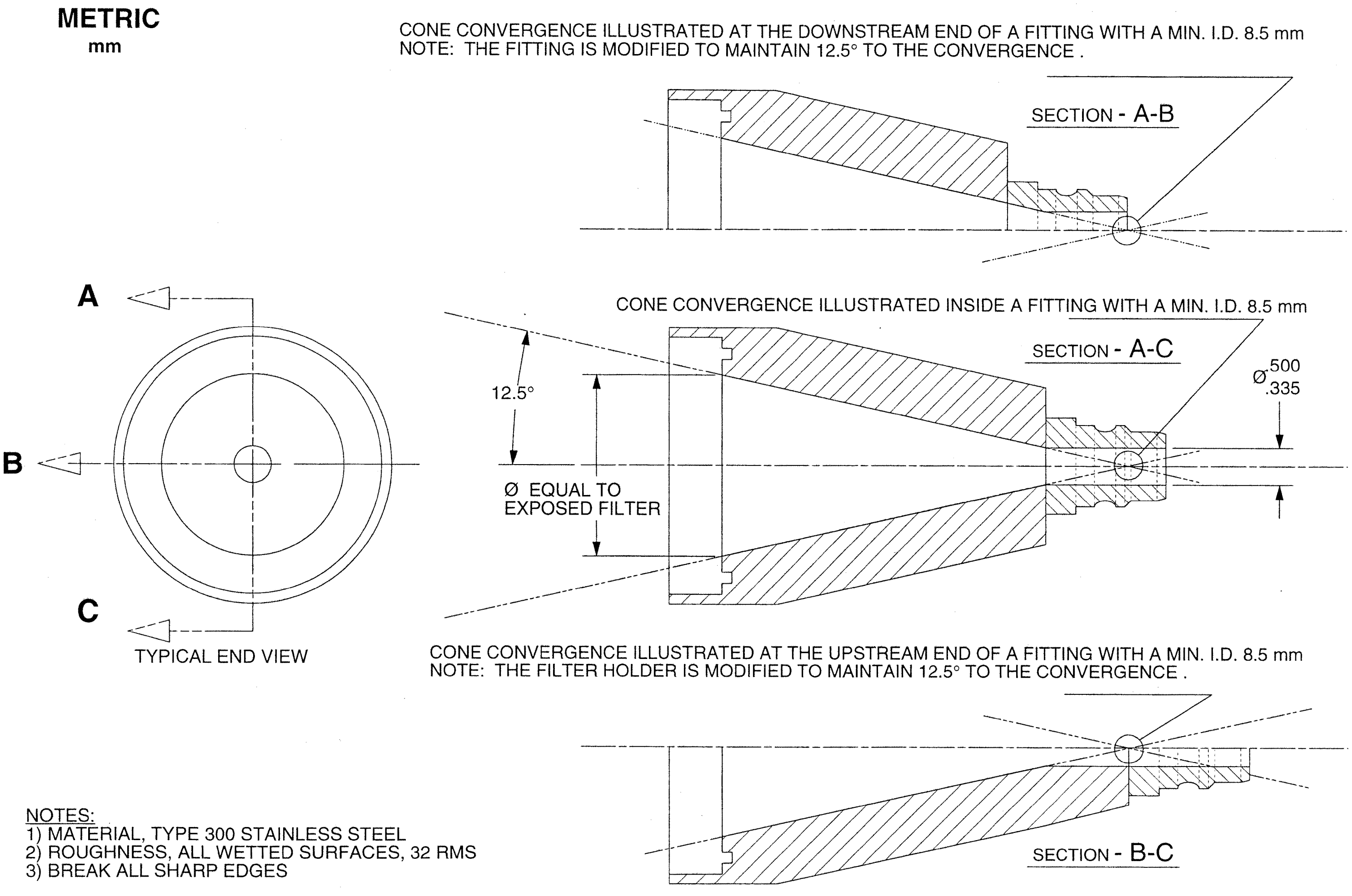
(iv) *Particle preclassifier.* A particle preclassifier shall be installed immediately upstream of the filter holder assembly (N07–1). The purpose of the preclassifier is to remove coarse, mechanically generated particles (e.g., rust from the engine exhaust system or carbon sheared from the sampling system walls) from the sample flow stream while allowing combustion-generated particles to pass through to the filter. The preclassifier may be either an inertial impactor or a cyclonic separator. The preclassifier manufacturer 50% cutpoint particle diameter shall be between 2.5 μm and 10 μm at the volumetric flow rate selected for sampling of particulate matter emissions. Sharpness of cut is not specifically defined, but the preclassifier geometry shall allow at least 99% of the mass concentration of 1 μm particles to pass through the exit of the preclassifier to the filter at the volumetric flow rate selected for sampling particulate matter emissions. Periodic servicing of the preclassifier will be necessary to prevent a buildup of mechanically separated particles. The particle preclassifier may be made integral with the top of the filter holder assembly. The preclassifier may also be made integral with a mixing-tee for introduction of secondary dilution air, thus replacing the secondary dilution tunnel; provided that the preclassifier provides sufficient mixing.

BILLING CODE 6560–50–P

Figures to § 86.1310-2007

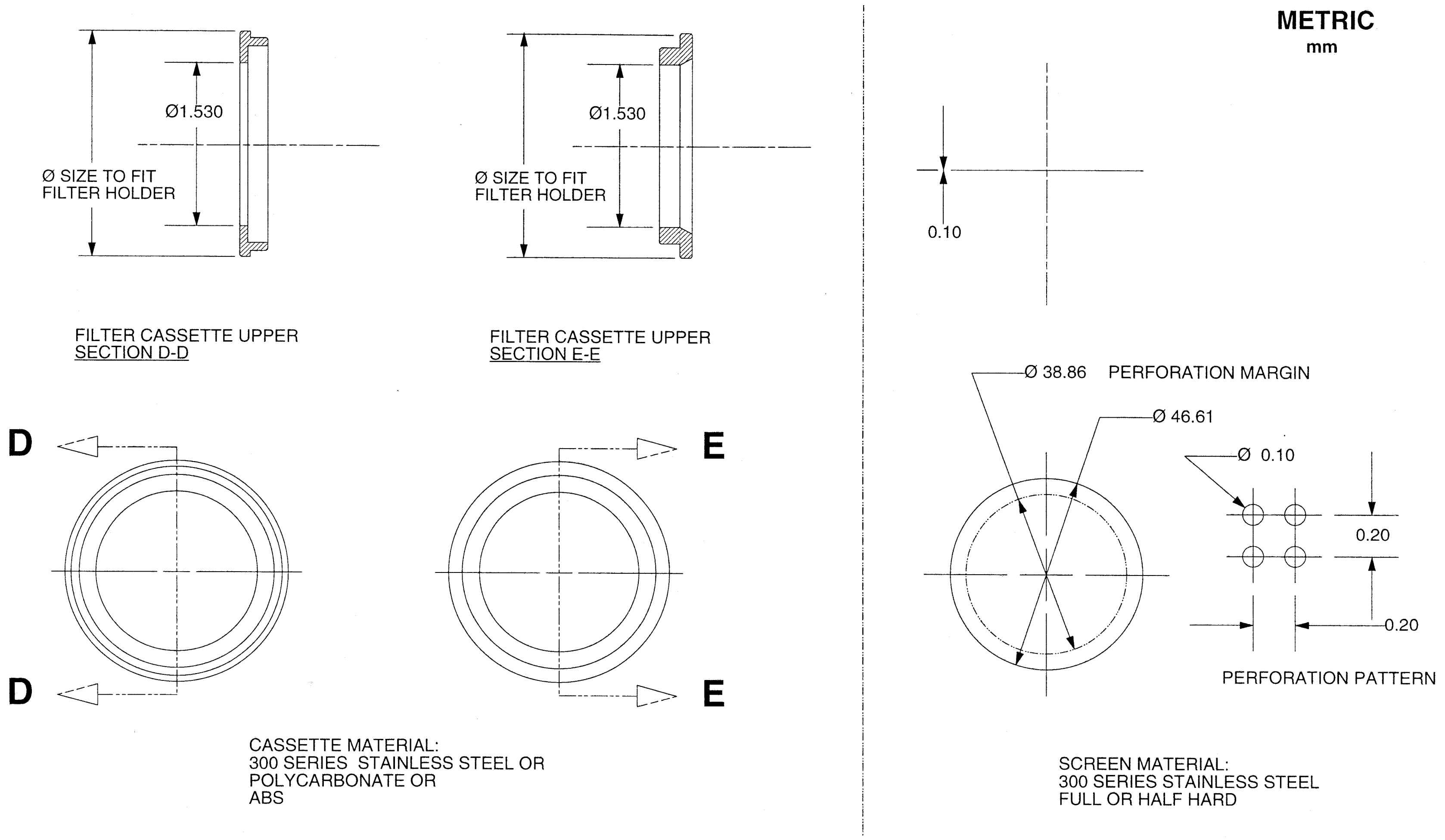


N07-1 GASEOUS AND PARTICULATE EMISSIONS SAMPLING SYSTEM (PDP - CFV CONSTANT VOLUME SAMPLER)



NOTES:
1) MATERIAL, TYPE 300 STAINLESS STEEL
2) ROUGHNESS, ALL WETTED SURFACES, 32 RMS
3) BREAK ALL SHARP EDGES

N07-2 FILTER HOLDER GEOMETRY



N07-3 FILTER CASSETTE AND SCREEN

BILLING CODE 6560–50–C

30. A new section 86.1312–2007 is added to Subpart N to read as follows:

§ 86.1312–2007 Filter stabilization and microbalance workstation environmental conditions, microbalance specifications, and particulate matter filter handling and weighing procedures.

(a) *Ambient conditions for filter stabilization and weighing.*—(1) *Temperature and humidity.* (i) The filter stabilization environment shall be maintained at 22 °C ± 3 °C and a dewpoint of 9.5 °C ± 1 °C. Dewpoint shall be measured with an instrument that exhibits an accuracy of at least ±0.25 °C NIST traceable as stated by the instrument manufacturer. Temperature shall be measured with an instrument that exhibits an accuracy of at least ±0.2°C or better.

(ii) The immediate microbalance workstation environment shall be maintained at 22 °C ± 1 °C and a dewpoint of 9.5 °C ± 1 °C. If the microbalance workstation environment freely circulates with the filter stabilization environment, and this entire environment meets 22 °C ± 1 °C and a dewpoint of 9.5 °C ± 1 °C , then there is no requirement to measure temperature and dewpoint at the microbalance separate from the filter stabilization location. Otherwise, temperature at the microbalance workstation shall be measured with an instrument that exhibits an accuracy of at least ±0.2°C or better, and dewpoint shall be measured with an instrument that exhibits an accuracy of at least ±0.25 °C NIST traceable as stated by the instrument manufacturer.

(2) *Cleanliness.* (i) The microbalance and filter stabilization environments shall be free of ambient contaminants (such as dust or other aerosols) that could settle on the particulate filters. It is recommended that these environments be built to conform with the Class 1000 specification (or cleaner) as determined by Federal Standard 209D or 209E for clean room classification (Available from the Institute of Environmental Standards and Technology website at *www.iest.org* or phone (847) 255–1561). An alternative recommendation would be to equilibrate and/or weigh the filters within a separate, smaller, particle-free, temperature and humidity-controlled chamber (*i.e.,* ‘‘glove box’’).

(ii) Reference filters shall be used to monitor for gross particle contamination. It is required that at least two unused reference filters remain in the filter stabilization environment at all times in partially covered glass petri dishes, as in paragraph (c) (1) of this section. These reference filters shall be placed in the filter stabilization environment. The reference filters shall be weighed within 2 hours of, but preferably at the same time as, the sample filters. The reference filters shall be changed at least once a month, but never while any sample filters are between their tare weight (pre-sampling) and gross weight (post-sampling) measurements. The reference filters shall be the same size and material as the sample filters.

(3) *Quality control of ambient conditions.* (i) If, before the start of a weighing session, the temperature or dewpoint of the filter stabilization environment are not within specifications, then filters must remain in the environment for at least 30 minutes after conditions are corrected. If the filter stabilization environment changes during a weighing session such that the specifications are no longer met, the weighing session shall be suspended until the environment has returned to within specifications for at least 30 minutes. Once the environment has returned to within specifications for at least 30 minutes, the reference filters shall be reweighed and the criteria in paragraph (a)(3)(ii) of this section shall apply. Note that temperature and dewpoint shall be sampled once per second, and an unweighted 5-minute moving average of this data shall be calculated once per second. This moving average shall be used to determine the environment temperature and dewpoint for the purpose of determining whether or not the environment is within specifications.

(ii) If the average change in weight of the reference filters is more than 10 micrograms (after correcting for buoyancy as described in paragraph (c)(3) of this section), then all filters in the process of stabilization shall be discarded and all data collected with respect to the discarded filters shall be considered void. Note that more than 2 reference filters may be used to achieve a more robust average of the change in weight of the reference filters.

(b) *Microbalance specifications.* The microbalance used to determine the weights of all filters shall have a precision (standard deviation) of at least ±0.25 micrograms or better for repeated weighing of a calibration weight, a precision of at least ±2.5 micrograms or better for repeated weighing of a clean filter, and a readability equal to or less than 0.1 micrograms. It is recommended that the microbalance be installed on a vibration isolation platform to isolate the microbalance's load cell from external vibration. It is also recommended that the microbalance should be shielded from convective airflow by means of an electrically grounded static dissipative draft shield. Microbalance manufacturer specifications for all preventive maintenance, periodic certification, calibration, and re-zeroing shall be followed. All certification and calibration procedures shall be NIST traceable, or traceable to an equivalent national standard.

(c) *Particulate matter filter handling and weighing.* Care should be taken to prevent contamination of the sample filters and to prevent a buildup of static charge on the filters that could interfere with filter weighing. Static neutralizers, such as Po-210 sources, shall be used to neutralize charge on a filter prior to each weighing. A static neutralizer should be replaced at the interval recommended by its manufacturer, or when it is no longer able to reduce static charge on a filter to less than ±2 VDC as measured with an electrostatic monitor at the microbalance workstation. The person weighing filters shall be grounded with respect to the microbalance to prevent imparting a static charge on the filters. This can be accomplished safely by using a grounding strap such as the wrist straps that are commonly used in the microelectronics industry, or by connecting a similar grounding strap to the tweezers. To prevent electrical shock, a 1-megohm resistor should be installed in series between the person weighing filters and ground.

(1) Within the filter stabilization environment, a pair of clean and electrically conductive tweezers shall be used to place a filter in the lower half of a filter cassette and the cassette shall be placed in a partially open glass petri dish. The petri dish lid should extend over the filter to prevent gross contamination, but it should be left slightly open on one edge to permit stabilization with the environment for at least 30 minutes.

(2) After at least 30 minutes of stabilization, each filter shall be weighed using the specified microbalance. The process of weighing a filter may be repeated and a statistical mean weight of a single filter may be calculated. Sound engineering judgment shall dictate the use of statistics to discard outliers and the weighting of averages. For a clean filter its single weight or statistical mean weight shall be considered the uncorrected tare weight of the filter.

(3) All filter weights shall be corrected for filter buoyancy in air. For the uncorrected tare weight of a filter, this calculated value is the corrected tare weight of the filter, and it must be recorded (see § 86.1344(e)(18)).

Barometric pressure of the microbalance environment shall be measured with an instrument that exhibits ±0.01% full-scale accuracy and 0.01% per-year full scale stability, and the full-scale value used for such a specification shall not exceed 200 kPa.

(i) Buoyancy correction calculation. (A) Calculate vapor pressure of liquid water using the dewpoint temperature in the Magnus formula:

$$P_w = 0.6113 \times 10\wedge\ ((7.5 \times T_{dp})/(237.3 + T_{dp}))$$

Where:

P_w=vapor pressure of liquid water, kPa.
T_{dp}=dewpoint temperature, °C.

(B) Calculate air density using the ideal gas relationship and molecular weights of standard air and water:

$$A=(3.484{\times}P-1.317{\times}P_w)/(T+273.15)$$

Where:

A=air density, kg/m^3.
P=barometric pressure, kPa.
P_w=vapor pressure of liquid water, kPa.
T=temperature, °C.

(C) Buoyancy correction:

$$M=R{\times}(1-(A/\rho_w))/(1-(A/\rho_s)).$$

Where:

M=corrected mass in units of the balance display.
R=uncorrected filter weight in units of the balance display.
A=calculated air density, kg/m^3.
ρ_w=density of calibration weight used to calibrate the balance, kg/m^3.
ρ_s=density of filter material used to sample PM emissions, kg/m^3.

(ii) For determining ρ_s note that PTFE (Teflon™) and borosilicate glass both have densities in the range of 2,200 to 2,400 kg/m^3. Therefore, for PTFE-coated borosilicate glass fiber filters, an acceptable ρ_s is 2,300 kg/m^3. Note also that polymethylpentene has a density of 850 kg/m^3. Because Teflon PTFE membrane filters have an integral polymethylpentene support ring that accounts for 95% of the filter mass, an acceptable ρ_s for these filters is 920 kg/m^3. Other ρ_s values for other filters may be obtained similarly. Information about ‘‘ρ_s should be available from the calibration weight manufacturer.

(iii) This paragraph (c)(3)(iii) shows an example of the buoyancy correction. This example assumes the following inputs: Barometric pressure (P)=101.325 kPa, temperature (T)=22.0 °C, dewpoint temperature (T_{dp})=9.5 °C, balance display (R)=100.0000 mg, calibration weight density (ρ_w)=8,000 kg/m^3, and filter material density (ρ_s)=2,300 kg/m^3. Then:

(A) The water vapor pressure (P_w) is calculated as:

$$P_w = 0.6113 \times 10\ ((7.5 \times 9.5)/(237.3 + 9.5)) = 1.186\ \text{kPa}.$$

(B) The air density (A) is calculated as:

$$A = (3.484 \times 101.325\ -\ 1.317 \times 1.186)/(22.0 + 273.15) = 1.191\ \text{kg/m}^3.$$

(C) The corrected mass (M) is calculated as:

$$M=100.0000 \times (1\ -\ (1.191/8000))/(1\ -\ (1.191/2300)) = 100.0369\ \text{mg}.$$

(4) The uncorrected weight, corrected weight, barometric pressure, temperature and humidity, of the filter shall be recorded. Afterward the filter shall be returned to the lower half of the filter cassette, and the upper half of the cassette shall be set in place. The cassette-with filter-shall then be stored in a covered glass petri dish or a sealed (*i.e.,* ends plugged) filter holder assembly, either of which shall remain in the filter stabilization environment until needed for testing. It is recommended that the filter be transported between the filter stabilization environment and the location of the emissions test within a sealed filter holder assembly.

(5) After the emissions test, the filter cassette shall be removed from the filter holder assembly. If this removal is performed in the filter stabilization environment, the upper half of the cassette shall be removed using a properly designed separator tool, the lower half of the cassette-with filter-shall be placed in a partially covered petri dish, and allowed to stabilize for at least 30 minutes. Otherwise, the cassette and filter shall be placed in a closed petri dish until it can be returned to the filter stabilization environment. Once the closed petri dish is returned to the filter stabilization environment, the petri dish shall be opened, the upper half of the cassette shall be removed using a properly designed separator tool, the lower half of the cassette-with filter-shall be placed in a partially covered petri dish, and allowed to stabilize for at least one hour.

(6) After at least 30 minutes, but no more than 60 hours of stabilization, each filter may be weighed using the specified microbalance. The process of weighing a filter may be repeated and a statistical mean may be calculated. Sound engineering judgment shall dictate the use of statistics to discard outliers and the weighting of averages. For a used filter, its single weight or statistical mean weight shall be identified as the uncorrected gross weight of the filter. The uncorrected gross weight shall be corrected for filter buoyancy using the procedure in (c)(3) of this section. The uncorrected gross filter weight, corrected gross filter weight, barometric pressure, temperature, and dewpoint shall be recorded.

(7) The net particulate matter weight (Pf) of each filter shall be equal to the corrected gross filter weight minus the corrected tare filter weight.

(8) Should the particulate matter on the filters contact the petri dish, tweezers, microbalance or any other surface, the data with respect to that filter is void.

31. A new § 86.1313–2004 is added to subpart N to read as follows:

§ 86.1313–2004 Fuel specifications.

Section 86.1313–04 includes text that specifies requirements that differ from § 86.1313–94 and § 86.1313–98. Where a paragraph in § 86.1313–94 or § 86.1313–98 is identical and applicable to § 86.1313–04, this may be indicated by specifying the corresponding paragraph and the statement ‘‘[Reserved]. For guidance see § 86.1313–94.’’ or ‘‘[Reserved]. For guidance see § 86.1313–98.’’.

(a) *Gasoline fuel.* (1) Gasoline having the following specifications will be used by the Administrator in exhaust and evaporative emission testing of petroleum-fueled Otto-cycle engines, except that the Administrator will not use gasoline having a sulfur specification higher than 0.0045 weight percent. Gasoline having the following specification or substantially equivalent specifications approved by the Administrator, must be used by the manufacturer in exhaust and evaporative testing except that octane specifications do not apply:

Item	ASTM test method No.	Value
(i) Octane, Research, Min.	D2699	93
(ii) Sensitivity, Min.		7.5
(iii) Lead (organic), maximum: g/U.S. gal. (g/liter)	D3237	0.050 (0.013)
(iv) Distillation Range:	D86	
(A) IBP [1]: °F (°C)		75–95 (23.9–35)
(B) 10 pct. point: °F (°C)		120–135 (48.9–57.2)

Item	ASTM test method No.	Value
(C) 50 pct. point: °F (°C)		200–230 (93.3–110)
(D) 90 pct. point: °F (°C)		300–325 (148.9–162.8)
(E) EP, max: °F (°C)		415 (212.8)
(v) Sulfur, weight pct.	D1266	0.0015–0.008
(vi) Phosphorous, max. g/U.S. gal (g/liter)	D3231	0.005 (0.0013)
(vii) RVP [2, 3]	D3231	8.7–9.2 (60.0–63.4)
(viii) Hydrocarbon composition:	D1319	
(A) Olefins, max. pct.		10
(B) Aromatics, max, pct.		35
(C) Saturates		Remainder

[1] For testing at altitudes above 1,219 m (4000 feet), the specified range is 75–105 deg. F (23.9–40.6 deg. C).

[2] For testing which is unrelated to evaporative emission control, the specified range is 8.0–9.2 psi (55.2–63.4 kPa).

[3] For testing at altitudes above 1,219 m (4000 feet), the specified range is 7.6–8.0 psi (52–55 kPa).

(2) For engines certified for sale in the 50 United States, ‘‘California Phase 2’’ gasoline having the specifications listed in the table in this section may be used in exhaust emission testing as an option to the specifications in paragraph (a)(1) of this section. If a manufacturer elects to utilize this option, the manufacturer must conduct exhaust emission testing with gasoline having the specifications listed in the table in this paragraph (a)(2). However, the Administrator may use or require the use of test fuel meeting the specifications in paragraph (a)(1) of this section for certification confirmatory testing, selective enforcement auditing and in-use testing. All fuel property test methods for this fuel are contained in Chapter 4 of the California Regulatory Requirements Applicable to the National Low Emission Vehicle Program (October, 1996). These requirements are incorporated by reference (see § 86.1). The table follows:

Fuel property	Limit
(i) Octane, (R+M)/2 (min)	91
(ii) Sensitivity (min)	7.5
(iii) Lead, g/gal (max) (No lead added)	0–0.01
(iv) Distillation Range, °F:	
(A) 10 pct. point,	130–150
(B) 50 pct. point,	200–210
(C) 90 pct. point,	290–300
(D) EP, maximum	390
(v) Residue, vol % (max)	2.0
(vi) Sulfur, ppm by wt.	15–40, except that Administrator may use and approve for use, lower ranges where such ranges are consistent with current California requirements.
(vii) Phosphorous, g/gal (max)	0.005
(viii) RVP, psi	6.7–7.0
(ix) Olefins, vol %	4.0–6.0
(x) Total Aromatic Hydrocarbons (vol %)	22–25
(xi) Benzene, vol %	0.8–1.0
(xii) Multi-Substituted Alkyl Aromatic Hydrocarbons, vol %	12–14
(xiii) MTBE, vol %	10.8–11.2
(xiv) Additives	See Chapter 4 of the California Regulatory Requirements Applicable to the National Low Emission Vehicle Program (October, 1996). These procedures are incorporated by reference (see § 86.1).
(xv) Copper Corrosion	No. 1
(xvi) Gum, Washed, mg/100 ml (max)	3.0
(xvii) Oxidation Stability, minutes (min)	1000
(xviii) Specific Gravity	No limit; report to purchaser required
(xix) Heat of Combustion	No limit; report to purchaser required
(xx) Carbon, wt %	No limit; report to purchaser required
(xxi) Hydrogen, wt %	No limit; report to purchaser required

(3)(i) Unless otherwise approved by the Administrator, unleaded gasoline representative of commercial gasoline that will be generally available through retail outlets must be used in service accumulation. Unless otherwise approved by the Administrator, this gasoline must have a minimum sulfur content of 15 ppm. Unless otherwise approved by the Administrator, fuel used for evaporative emission durability demonstration must contain ethanol as required by § 86.1824–01(a)(2)(iii). Leaded gasoline must not be used in service accumulation.

(ii) Unless otherwise approved by the Administrator, the octane rating of the gasoline used must be no higher than 1.0 Retail octane number above the lowest octane rating that meets the fuel grade the manufacturer will recommend to the ultimate purchaser for the relevant production vehicles. If the manufacturer recommends a Retail octane number rather than a fuel grade, then the octane rating of the service accumulation gasoline can be no higher than 1.0 Retail octane number above the recommended Retail octane number. The service accumulation gasoline must also have a minimum sensitivity of 7.5 octane numbers, where sensitivity is defined as the Research octane number minus the Motor octane number.

(iii) The Reid Vapor Pressure of the gasoline used must be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(4) The specification range of the gasoline to be used under paragraph (a) of this section must be reported in accordance with § 86.094–21(b)(3).

(b) heading and (b)(1) [Reserved]. For guidance see § 86.1313–94.

(b)(2) [Reserved]. For guidance see § 86.1313–98.

(b)(3) through (g) [Reserved]. For guidance see § 86.1313–94.

32. A new § 86.1313–2007 is added to Subpart N to read as follows:

§ 86.1313–2007 Fuel specifications.

Section 86.1313–2007 includes text that specifies requirements that differ from § 86.1313–94 and § 86.1313–2004. Where a paragraph in § 86.1313–94 or § 86.1313–2004 is identical and applicable to § 86.1313–2007, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.1313–94.'' or ''[Reserved]. For guidance see § 86.1313–04.''.

(a) [Reserved]. For guidance see § 86.1313–2004.

(b) heading and (b)(1) [Reserved]. For guidance see § 86.1313–94.

(b)(2) Petroleum fuel for diesel engines meeting the specifications in Table N07–2, or substantially equivalent specifications approved by the Administrator, shall be used in exhaust emissions testing. The grade of petroleum fuel used shall be commercially designated as ''Type 2-D'' grade diesel fuel except that fuel commercially designated as ''Type 1-D'' grade diesel fuel may be substituted provided that the manufacturer has submitted evidence to the Administrator demonstrating to the Administrator's satisfaction that this fuel will be the predominant in-use fuel. Such evidence could include such things as copies of signed contracts from customers indicating the intent to purchase and use ''Type 1-D'' grade diesel fuel as the primary fuel for use in the engines or other evidence acceptable to the Administrator. (Note: Vehicles certified under § 86.007–11(f) must be tested using the test fuel specified in § 86.1313–2004, unless otherwise allowed by the Administrator.) Table N07–2 follows:

TABLE N07–2

Item		ASTM test method No.	Type 1–D	Type 2–D
(i) Cetane Number		D613	40–54	40–50
(ii) Cetane Index		D976	40–54	40–50
(iii) Distillation range:				
(A) IBP	°F	D86	330–390	340–400
	(°C)		(165.6–198.9)	(171.1–204.4)
(B) 10 pct. point	°F	D86	370–430	400–460
	(°C)		(187.8–221.1)	(204.4–237.8)
(C) 50 pct. point	°F	D86	410–480	470–540
	(°C)		(210.0–248.9)	(243.3–282.2)
(D) 90 pct. point	°F	D86	460–520	560–630
	(°C)		(237.8–271–1)	(293.3–332.2)
(E) EP	°F	D86	500–560	610–690
	(°C)		(260.0–293.3)	(321.1–365.6)
(iv) Gravity	°API	D287	40–44	32–37
(v) Total sulfur	ppm	D2622	7–15	7–15
(vi) Hydrocarbon composition:.				
(A) Aromatics, minimum (Remainder shall be paraffins, naphthenes, and olefins).	pct.	D5186	8	27
(vii) Flashpoint, min	°F	D93	120	130
	(°C)		(48.9)	(54.4)
(viii) Viscosity	centistokes	D445	1.6–2.0	2.0–3.2

(3) Petroleum Diesel fuel for diesel engines meeting the specifications in table N07–3, or substantially equivalent specifications approved by the Administrator, shall be used in service accumulation. The grade of petroleum diesel fuel used shall be commercially designated as Type 2–D'' grade diesel fuel except that fuel commercially designated as ''Type 1–D'' grade Diesel fuel may be substituted provided that the manufacturer has submitted evidence to the Administrator demonstrating to the Administrator's satisfaction that this fuel will be the predominant in-use fuel. Such evidence could include such things as copies of signed contracts from customers indicating the intent to purchase and use ''Type 1–D'' grade diesel fuel as the primary fuel for use in the engines or other evidence acceptable to the Administrator. Table N07–03 follows:

TABLE N07–3

Item		ASTM test method No.	Type 1–D	Type 2–D
(i) Cetane Number		D613	40–56	38–58
(ii) Cetane Index		D976	min. 40	min. 40
(iii) Distillation range:				
90 pct. point	°F	D86	440–530	540–630
	(°C)		(226.7–276–7)	(293.3–332.2)
(iv) Gravity	°API	D287	39–45	30–39
(v) Total sulfur	ppm	D2622	7–15	7–15

TABLE N07–3—Continued

Item		ASTM test method No.	Type 1–D	Type 2–D
(vi) Flashpoint, min	°F (°C)	D93	130 (54.4)	130 (54.4)
(vii) Viscosity	centistokes	D445	1.2–2.2	1.5–4.5

(b)(4) through (g) [Reserved]. For guiDance see § 86.1313–94.

33. Section 86.1319–90 is amended by redesignating paragraph (e) as paragraph (f), and adding a new paragraph (e) to read as follows:

§ 86.1319–90 CVS calibration.

* * * * *

(e) *SSV calibration.* (1) The calibration of the SSV located in the tunnel shall be conducted in a similar manner as the CFV or PDP calibration. Gas flow within the SSV is a function of inlet pressure, P_1, the inlet temperature, T_1, and the pressure drop between the throat and the inlet, DP. Note that the following procedure is consistent with SAE J244. The calibration procedure described in paragraph (e)(3) of this section establishes the values of the coefficients at measured values of pressure, temperature and airflow.

(i) The flow rate for a subsonic venturi is calculated as a volumetric flow rate (Q_s) or a mass flow rate (Q_m) as follows: or

$$Q_s = \frac{Q_m}{\rho_s} = \frac{K_q}{\rho_s}\left(\frac{C_d * Y * d^2}{\sqrt{1-\beta^4}}\right)\sqrt{\rho_i * \Delta P}$$

$$Q_m = K_q * C_d * Y * d^2\left(\frac{\rho_i * \Delta P}{1-\beta^4}\right)^{1/2}$$

Where:

K_q = 0.0021074 (SI units).

Q_s = Air Volume Flow, SCFM (m^3/min).

Q_m = Air Mass Flow, lbm/min (kg/min).

ρ_s = Density at Standard Conditions, lbm/ft^3 (kg/m^3) as specified in paragraph (e)(1)(v) of this section.

ρ_s = Density at inlet conditions, lbm/ft^3 (kg/m^3), as specified in paragraph (e)(1)(iii) of this section.

C_d = Coefficient of Discharge = Actual Air Flow/Theoretical Air Flow.

Y = Expansion factor, as specified in paragraph (e)(1)(ii) of this section.

d = Throat diameter, inch (mm).

β = Ratio of venturi throat diameter to approach pipe diameter.

ΔP = Pressure drop between inlet and throat, in. H_2O (kPa).

(ii) The expansion factor (Y) is calculated as follows:

$$Y = \left[r^{\frac{2}{k}}\left(\frac{k}{k-1}\right)\left(\frac{1-r^{\left(\frac{k-1}{k}\right)}}{1-r}\right)\left(\frac{1-\beta^4}{1-\beta^4 * r^{\frac{2}{k}}}\right)\right]^{\frac{1}{2}}$$

Where:

$$r = 1 - \frac{\Delta P}{P_{abs}}$$

$$\beta = \frac{d}{D}$$

$$d = \text{Throat diam., in (mm)}$$

$$D = \text{Inlet Pipe diam., in (mm)}$$

$$k = \text{Ratio of Specific Heat (1.40 for Air)}$$

(iii) The inlet density (ρ1) is calculated as follows:

$$\rho_1 = \frac{P_{abs}}{R_{mix} * T_{abs}}$$

Where:

$P_{abs} = P_1 + P_B$

$T_{abs} = T_1$ + 2731

$R_{mix} = R_u/|MW_{mix}$

R_u = 8.3144 kJ/kg-mole-K

MW_{mix} = the molecular weight of the mix, as calculated in paragraph (e)(1)(iv) of this section.

(iv) The molecular weight of the mix, is calculated as follows:

$$MW_{mix} = \frac{MW_{AIR} * \left(P_{abs} - P_V\right) + MW_{H_2O} * P_v}{P_{abs}}$$

Where:

P_V = Vapor pressure, in Hg (kPa)

MW_{AIR} = 28.964 kg/kg-mole

MW_{H_2O} = 18.015 kg/kg-mole

(v) The density at standard conditions of 101.33 kPa and 20 °C is calculated as follows:

$$\rho_s = \frac{101.33}{\frac{8.3144}{28.964} * 293.15} = 1.2041\ \mathrm{kg/m^3}$$

(2) The venturi manufacturer's recommended procedure shall be followed for calibrating electronic portions of the SSV.

(3) Measurements necessary for flow calibration of the SSV are as follows:

CALIBRATION DATA MEASUREMENT

Parameter	Sym	Units	Tolerance
(i) Barometric pressure (corrected to 32° F)	P_B	in. Hg (kPa)	± .01in. Hg (± .034kPa)
(ii) Air temperature, into calibration venturi	ETI	° F (° C)	±.5 °F (.28° C)
(iii) Pressure drop between the inlet and throat of calibration venturi (corrected to 68° F).	EDP	in. H_2O (kPA)	± .05 in. H_2O (±.012kPa)
(iv) Air Flow	Q_S	Std ft³/min (m³/min).	± 5% of NIST "true" value
(v) SSV inlet depression	P_I	in. H_2O (kPa)	± .23 in. H_2O (±.057kPa)
(vi) Pressure drop between the inlet and throat of SSV	DP	in. H_2O (kPa)	±.05 in. H_2O (±.012kPa)
(vii) Water vapor pressure of inlet air	P_V	in. Hg (kPa)	±.10 in. Hg (± .34kPa)
(vii) Temperature at SSV inlet	T_I	°F (°C)	±4.0 °F (2.2° C)

(4) Set up equipment similar to CFV or PDP calibration except the variable flow restrictor valve can be deleted or set in the open position, and the pressure drop reading device must be added. The calibration test must be conducted with the test subsonic venturi in place in its permanent position. Any subsequent changes in upstream or downstream configuration could cause a shift in calibration. Leaks between the calibration metering device and the SSV must be eliminated.

(5) Adjust the variable flow blower or restrictor valve to its maximum in-use flow rate. Allow the system to stabilize and record data from all instruments. Be sure to avoid choke condition.

(6) Vary the flow through a minimum of eight steps covering the intended in-use operating range of the SSV.

(7) Data analyses. If the calibration venturi is used at the tunnel inlet (free standing), then assume a value of β=0. If the SSV installed in the CVS tunnel, use the actual inside tunnel diameter and the throat diameter to compute β.

(i) Assume an initial value for Cd = 0.98 to calculate Q_m for the calculation of Reynolds number, Re,:

$$\mathrm{Re} = \frac{6.667\mathrm{E}4 * Q_m}{\pi * d * \mu}$$

Where: μ = viscosity of air, centipoise

$$\mu = K_\mu * \frac{T_k^{1.5}}{(T_K + 110.4)}$$

$K\mu$=1.458E−3
T_K=(T_I°C+273.16)

(ii) From the initial calibration of the venturi, establish an equation of Cd as a function of Re. The following functional forms should be reviewed, but a power series, least-squares fit polynomial equation may result in the best fit. Many factors involved in the installation of SSV and the operating range of the Reynolds number can affect the functional relationship of the Cd with Re. Calculate Cd based on this initial equation of Re. Compute a final Q_m based on this calculated Cd for both the calibration nozzle and the inline SSV.

(8)(i) Compute the percent difference in air flow between the calibration venturi and the inline SSV. If the difference in percent of point is greater than 1%, compute a new Cd and Re for the in-tunnel venturi as follows: Cd_{new}=Actual Air Flow/Theoretical Air Flow=Qm_{act} /Qm_{theo}

$$\mathrm{Re}_{new} = \frac{0.8Qm_{cal}}{\pi * d * \mu}$$

(ii) Qm_{act} is flow measured by the calibration venturi and Qm_{theo} is the theoretical calculated flow based on the in-tunnel SSV conditions with Cd set equal to 1. Re_{new} is based on the calibrated venturi flow, but the in-tunnel SSV properties. Recalculate a new curve fit of Cd_{new} for the inline venturi as a function of Re_{new} following the guidelines in paragraph (e)(7) of this section. Agreement of the fit should be within 1.0% of point. Install the new Cd curve fit in the test cell flow computing device and conduct the propane injection, flow verification test.

* * * * *

34. A new section 86.1323–2007 is added to Subpart N to read as follows:

§ 86.1323–2007 Oxides of nitrogen analyzer calibration.

This section describes the initial and periodic calibration of the chemiluminescent oxides of nitrogen analyzer.

(a) Prior to introduction into service and at least monthly thereafter, the chemiluminescent oxides of nitrogen analyzer must be checked for NO2 to NO converter efficiency. The Administrator may approve less frequent checks of the converter efficiency. Figure N84–9 is a reference for paragraphs (a) (1) through (11) of this section.

(1) Follow good engineering practices for instrument start-up and operation. Adjust the analyzer to optimize performance.

(2) Zero the oxides of nitrogen analyzer with zero-grade nitrogen.

(3) Connect the outlet of the NO_X generator to the sample inlet of the oxides of nitrogen analyzer, which has been set to the most common operating range.

(4) Introduce into the NO_X generator-analyzer system an NO-in-nitrogen (N2) mixture with an NO concentration equal to approximately 80 percent of the most common operating range. The NO2 content of the gas mixture shall be less than 5 percent of the NO concentration.

(5) With the oxides of nitrogen analyzer in the NO mode, record the concentration of NO indicated by the analyzer.

(6) Turn on the NO_X generator O2 supply and adjust the O2 flow rate so that the NO indicated by the analyzer is about 10 percent less than indicated in paragraph (a)(5) of this section. Record the concentration of NO in this NO + O2 mixture.

(7) Switch the NO_X generator to the generation mode and adjust the generation rate so that the NO measured by the analyzer is 20 percent of that

measured in paragraph (a)(5) of this section. There must be at least 10 percent unreacted NO at this point. Record the concentration of residual NO.

(8) Switch the oxides of nitrogen analyzer to the NO_X mode and measure total NO_X. Record this value.

(9) Switch off the NO_X generator but maintain gas flow through the system. The oxides of nitrogen analyzer will indicate the NO_X in the NO + O2 mixture. Record this value.

(10) Turn off the NO_X generator O2 supply. The analyzer will now indicate the NO_X in the original NO-in-N2 mixture. This value should be no more than 5 percent above the value indicated in paragraph (a)(4) of this section.

(11) Calculate the efficiency of the NO_X converter by substituting the concentrations obtained into the following equation:

$$\text{Percent} - \text{efficiency} = \left(1 + \frac{a - b}{c - d}\right) \times 100$$

Where:
a = concentration obtained in paragraph (a)(8) of this section,
b = concentration obtained in paragraph (a)(9) of this section,
c = concentration obtained in paragraph (a)(6) of this section,
d = concentration obtained in paragraph (a)(7) of this section.

(12) If converter efficiency is not greater than 90 percent, repair the analyzer. The repaired analyzer must achieve a converter efficiency greater than 90 percent before the analyzer may be used.

(b) *Accuracy.* The accuracy at the minimum limit of the NO_X analyzer is defined in § 86.1338–2007. In general the analyzer's minimum limit shall be the lowest concentration within a given range, in which it has an accuracy of ±2 percent of point.

(c) *Initial and periodic calibration.* Prior to its introduction into service and monthly thereafter, the chemiluminescent oxides of nitrogen analyzer shall be calibrated on all normally used instrument ranges. Use the same flow rate as when analyzing samples. Proceed as follows:

(1) Adjust analyzer to optimize performance.

(2) Zero the oxides of nitrogen analyzer with zero-grade nitrogen (N2).

(3) (i) Calibrate all operating ranges with a minimum of 9 NO-in-N2 calibration gases (*e.g.*, 10, 20, 30, 40, 50, 60, 70, 80, and 90 percent of that range) and one zero-grade N2 gas. Sound engineering judgment shall dictate appropriate spacing and weighting of the calibration points.

(ii) For each range calibrated, if all deviations from a least-squares best-fit straight line are within ±2 percent of the value at each non-zero data point and within ±0.3 percent of full scale on the zero data point, then concentration values may be calculated using the linear calibration equation for that range. If the specified deviations are exceeded for ranges that have a minimum limit of 1 ppm or greater, then the best-fit non-linear equation that represents the data within these deviations may be used to determine concentration values. For ranges that have a minimum limit less than 1 ppm, only a linear or second order non-linear equation that represents the data within these deviations, may be used to determine concentration values.

(d) *Chemiluminescent NO_X analyzer interference check (i.e., quench check).* Prior to its introduction into service and at least once per year thereafter, the quench check described in this section shall be performed on CLD NO_X analyzers. CO2 and water vapor interfere with the response of a CLD by collisional quenching. The combined quench effect at their highest expected concentrations shall not exceed 2 percent.

(1) *CO_2 quench check procedure:* (i) For the procedure described in this paragraph, variations are acceptable provided that they produce equivalent $\%CO2_{quench}$ results. Connect a pressure-regulated CO_2 span gas to one of the inlets of a three-way valve. Its CO2 concentration should be approximately twice the maximum CO_2 concentration expected during testing. The valve must be leak-free, and its wetted parts must be made of a stainless steel or other inert material. Connect a pressure-regulated zero-grade N_2 gas to the other inlet of the three-way valve. Connect the single outlet of the valve to the balance-gas port of a properly operating gas divider. Connect a pressure-regulated NO span gas, which has approximately twice the typical NO concentration expected during testing, to the span-port of the gas divider. Configure the gas divider such that nearly equal amounts of the span gas and balance gas are blended with each other. Viscosity corrections shall be applied appropriately to ensure correct mass flow determinations.

(ii) With the CO_2 flowing to the balance port and the NO flowing to the span port, measure a stable CO_2 concentration from the gas divider's outlet with a properly calibrated NDIR analyzer. Record this concentration in percent (%); this is ''$\%CO_2$''. This value will be used in the water vapor quench check calculations that are detailed in the following section. After the $\%CO_2$ measurement, measure the NO concentration at the gas divider outlet with the CLD analyzer in the NO mode. Record this concentration in ppm; this is ''NO_{CO2}''. Then switch the three-way valve such that 100 percent N_2 flows to the balance port inlet. Monitor the CO_2 concentration of the gas divider's outlet until its concentration stabilizes at zero. Then measure the stable NO concentration from the gas divider's outlet. Record this value in ppm; this is ''NO_{N2}''. Calculate $\%CO_{2quench}$ as follows:

$$\%CO_{2quench} = (1.00 - (NO_{CO2}/NO_{N2})) \times 100$$

(2) Water vapor quench check procedure:

(i) For all dry CLD analyzers it must be demonstrated that for the highest expected water vapor concentration (*i.e.*, ''$\%H_2O_{exp}$'' as calculated later in this section), the water removal technique maintains CLD humidity at less than or equal to 5 $g_{water}/kg_{dry\ air}$ (or about 0.008 percent H_2O), which is 100% RH at 3.9 °C and 101.3 kPa. This humidity specification is also equivalent to about 25% RH at 25 °C and 101.3 kPa. This may be demonstrated by measuring the temperature at the outlet of a thermal dehumidifier, or by measuring humidity at a point just upstream of the CLD. Humidity of the CLD exhaust might also be measured as long as the only flow into the CLD is the flow out of the dehumidifier.

(ii) For all ''wet'' CLD analyzers the following water vapor quench check procedure shall be followed. Measure an NO span gas, which has 90% to 100% of the typical NO expected during testing, using the CLD in the NO mode. Record this concentration in ppm; this is ''NO_{dry}''. Then bubble the same NO span gas through distilled water in a sealed vessel at 25 °C ±10 °C. This temperature specification imposed to ensure that the H_2O_{vol} calculation (refer to (iii) of this section) returns an accurate result. To prevent subsequent condensation, this temperature must also be less than any temperature that the wetted sample will experience between the sealed vessel's outlet and the CLD. Record the vessel's water temperature in °C; this is ''T_{sat}''. Record the vessel's absolute pressure in kPa; this is ''P_{sat}''. Measure the wetted span gas with the CLD, and record this value in ppm; this is ''NO_{wet}''.

(iii) Calculations for water quench must consider dilution of the NO span gas with water vapor and scaling of the water vapor concentration to that expected during testing.

(A) Calculate the volume fraction of water vapor in the wetted span gas, as $H_2O_{vol} = (\exp(3.69 - (81.28/T_{sat})) + 1.61)/P_{sat}$. This calculation approximates some of the thermodynamic properties of water based on the ‘‘1995 Formulation for the Thermodynamic Properties of Ordinary Water Substance for General and Scientific Use’’, issued by The International Association for the Properties of Water and Steam (IAPWS). However, this approximation should only be used as prescribed in this section because it is an exponential fit that is accurate for data at 25 °C ±10 °C. Then, assuming a diesel fuel atomic hydrogen to carbon ratio of 1.8, and an intake and dilution air humidity of 75 grains (10.71 $g_{water}/kg_{dry\ air}$ or 54.13 percent RH at 25 °C and 101.3 kPa),

(B) Calculate the maximum percent water vapor expected during testing; as $\%H_2O_{exp} = (0.90 \times \%CO_2) + 1.69$. $\%CO_2$ is the value measured during the $\%CO_2$ quench check.

(C) Calculate the expected wet concentration of NO in ppm; as $NO_{exp} = NO_{dry} \times (1.00 - H_2O_{vol})$

(iv) Calculate the percent water vapor quench as:

$\%H_2O_{quench} = ((NO_{exp} - NO_{wet})/NO_{exp}) \times (\%H_2O_{exp}/H_2O_{vol})$

(3) Add the $\%CO_{2quench}$ and the $\%H_2O_{quench}$ values. Their sum may not exceed the limit set in paragraph (d). If their sum is greater than this limit, then the CLD instrument may not be used to perform testing unless it is repaired. The analyzer must be shown to pass this quench check after the repair before it may be used for testing.

35. Section 86.1330–90 is amended by revising paragraph (a) to read as follows:

§ 86.1330–90 Test sequence; general requirements.

(a) The test sequence shown in Figure N90–10 shows the major steps of the test procedure, as follows:

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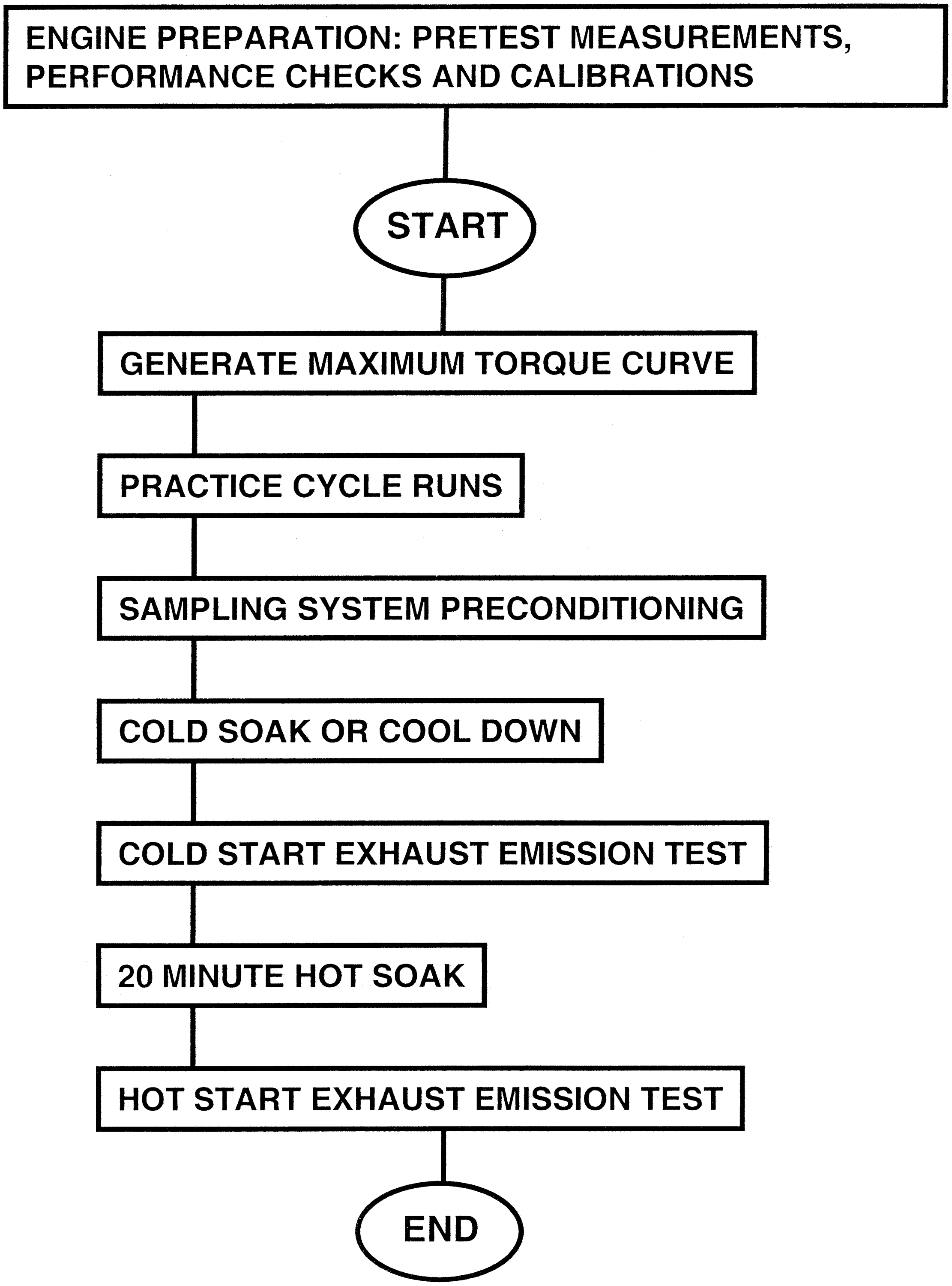
Figure N90-10 Test Sequence



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* * * * *

36. Section 86.1334–84 is amended by revising paragraph (a)(1) and (a)(2) to read as follows:

§ 86.1334–84 Pre-test engine and dynamometer preparation.

(a) * * * (1) Before the cold soak or cool down:

(i) Final calibration of the dynamometer and throttle control systems may be performed. These calibrations may consist of steady-state operations and/or actual practice cycle runs, and must be completed before sampling system preconditioning (if applicable).

(ii) Conduct sampling system preconditioning for diesel engines (optional for model years prior to 2007) by operating the engine at a condition of rated-speed, 100 percent torque for a minimum of 20 minutes while simultaneously operating the CVS and secondary dilution system and taking particulate matter emissions samples from the secondary dilution tunnel . Particulate sample filters need not be stabilized or weighed, and may be discarded. Filter media may be changed during conditioning as long as the total sampled time through the filters and sampling system exceeds 20 minutes. Flow rates shall be set at the approximate flow rates selected for transient testing. Torque shall be reduced from 100 percent torque while maintaining the rated speed condition as necessary to prevent exceeding the maximum sample zone temperature specifications of § 86.1310–2007.

(2) Following sampling system preconditioning cycle, the engine shall be cooled per § 86.1335–90.

* * * * *

37. A new section 86.1337–2007 is added to subpart N to read as follows:

§ 86.1337–2007 Engine dynamometer test run.

(a) The following steps shall be taken for each test:

(1) Prepare for the cold-start test.

(i) For gasoline- and methanol-fueled engines only, evaporative emission canisters shall be prepared for use in this testing in accordance with the procedures specified in § 86.1232–96 (h) or (j). The size of the canisters used for testing shall correspond with the largest canister capacity expected in the range of vehicle applications for each engine. (The Administrator may, at his/her discretion, use a smaller canister capacity.) Attach the evaporative emission canister(s) to the engine, using the canister purge plumbing and controls employed in vehicle applications of the engine being tested. Plug the canister port that is normally connected to the fuel tank.

(ii) Prepare the engine, dynamometer, and sampling system.

(iii) Change filters, etc., and leak check as necessary.

(2) Connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems if bag sampling is used.

(3) For methanol-fueled vehicles, install fresh methanol and formaldehyde impingers (or cartridges) in the exhaust and dilution air sample systems for methanol and formaldehyde. A single dilution air sample covering the total test period may be utilized for methanol and formaldehyde background. (Background measurements of methanol and formaldehyde may be omitted and concentrations assumed to be zero for calculations in § 86.1344.)

(4) Attach the CVS to the engine exhaust system any time prior to starting the CVS.

(5) Start the CVS (if not already on), the sample pumps (except for the particulate sample pump(s), if applicable), the engine cooling fan(s), and the data collection system. The heat exchanger of the constant volume sampler (if used), and the heated components of any continuous sampling system(s) (if applicable) shall be preheated to their designated operating temperatures before the test begins. (See § 86.1340(e) for continuous sampling procedures.)

(6) Adjust the sample flow rates to the desired flow rates and set the CVS gas flow measuring devices to zero. CFV–CVS sample flow rate is fixed by the venturi design.

(7) For engines tested for particulate emissions, carefully install a clean, loaded particulate sample filter cartridge into the filter holder assembly. It is recommended that this be done within the filter stabilization environment, with both ends of the filter holder assembly plugged during transport to the emissions test facility. Install the assembled filter holder into the sample flow line.

(8) Follow the manufacturer's instructions for cold starting. Simultaneously start the engine and begin exhaust and dilution air sampling. For petroleum-fueled diesel engines (and natural gas-fueled, liquified petroleum gas-fueled or methanol-fueled diesels, if used) Turn on the hydrocarbon and NO_X (and CO and CO_2, if continuous) analyzer system integrators (if used), and turn on the particulate sample pumps and indicate the start of the test on the data collection medium.

(9) Allow the engine to idle freely with no-load for 24±1 seconds. This idle period for automatic transmission engines may be interpreted as an idle speed in neutral or park. All other idle conditions shall be interpreted as an idle speed in gear. It is permissible to lug the engine down to curb idle speed during the last 8 seconds of the free idle period for the purpose of engaging dynamometer control loops.

(10) Begin the transient engine cycles such that the first non-idle record of the cycle occurs at 25±1 seconds. The free idle time is included in the 25±1 seconds.

(i) During particulate sampling it must be demonstrated that the ratio of main tunnel flow to particulate sample flow does not change by more than ±5.0 percent of its set point value (except for the first 10 seconds of sampling). For double dilution operation, sample flow is the net difference between the flow rate through the sample filters and the secondary dilution air flow rate.

(ii) Record flow. If the set flow rate cannot be maintained because of high particulate loading on the filter, the test shall be terminated. The test shall be rerun using a lower sample flow rate or greater dilution.

(11) Begin the transient engine cycles such that the first non-idle record of the cycle occurs at 25±1 seconds. The free idle time is included in the 25±1 seconds.

(12) On the last record of the cycle, cease sampling. Immediately turn the engine off and start a hot-soak timer. Also turn off the particulate sample pumps, the gas flow measuring device(s) and any continuous analyzer system integrator and indicate the end of the test on the data collection medium. Sampling systems should continue to sample after the end of the test cycle until system response times have elapsed.

(13) Immediately after the engine is turned off, turn off the engine cooling fan(s) if used. As soon as possible, transfer the ''cold start cycle'' exhaust and dilution air bag samples to the analytical system and process the samples according to § 86.1340. A stabilized reading of the exhaust sample on all analyzers shall be obtained within 20 minutes of the end of the sample collection phase of the test. Analysis of the methanol and formaldehyde samples shall be obtained within 24 hours of the end of the sample collection period. For particulate measurements, carefully remove the filter holder from the sample flow apparatus

(14) Allow the engine to soak for 20±1 minutes.

(15) Prepare the engine and dynamometer for the hot start test.

(16) Connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(17) Install fresh methanol and formaldehyde impingers (or capsules) in the exhaust and dilution air sample systems for methanol and formaldehyde.

(18) Start the sample pumps (except the particulate sample pump(s), if applicable), the engine cooling fan(s) and the data collection system. The heat exchanger of the constant volume sampler (if used) and the heated components of any continuous sampling system(s) (if applicable) shall be preheated to their designated operating temperatures before the test begins. See § 86.1340(e) for continuous sampling procedures.

(19) Adjust the sample flow rates to the desired flow rate and set the CVS gas flow measuring devices to zero.

(20) For diesel engines tested for particulate, carefully install a clean, loaded particulate sample filter cartridge in the filter holder assembly and install the filter holder assembly in the sample flow line.

(21) Follow the manufacturer's choke and throttle instruction for hot starting. Simultaneously start the engine and begin exhaust and dilution air sampling. For diesel engines, turn on the hydrocarbon and NO_X (and CO and CO2, if continuous) analyzer system integrator (if used), indicate the start of the test on the data collection medium, and turn on the particulate sample pump(s).

(22) [Reserved]

(23) Allow the engine to idle freely with no-load for 24±1 seconds. The provisions and interpretations of paragraph (a)(9) of this section apply.

(24) Begin the transient-engine cycle such that the first non-idle record of the cycle occurs at 25±1 seconds. The free idle is included in the 25±1 seconds.

(25) On the last record of the cycle, allow sampling system response times to elapse and cease sampling. Turn off the particulate sample pump(s) (if appropriate), the gas flow measuring device(s) and any continuous analyzer system integrator and indicate the end of the test on the data collection medium.

(26) As soon as possible, transfer the ''hot start cycle'' exhaust and dilution air bag samples to the analytical system and process the samples according to § 86.1340. A stabilized reading of the exhaust sample on all analyzers shall be obtained within 20 minutes of the end of the sample collection phase of the test. Analyze the methanol and formaldehyde samples within 24 hours. (If it is not possible to perform analysis within 24 hours, the samples should be stored in a cold (approximately 0 deg.C) dark environment until analysis can be performed). For particulate measurements, carefully remove the filter holder assembly. It is recommended that the filter cartridge be transferred to and from the filter stabilization environment within the filter holder assembly with both ends plugged, and that the cartridge be removed from the filter holder assembly within the stabilization environment. Transfer the particulate filter to the stabilization environment for post-test stabilization. Filters may be stabilized in the petri dishes while still within the filter cartridges, or the cartridge tops may be removed for stabilization, or the filters may be entirely removed from the filter cartridges and stabilized in the petri dishes alone. Removal of the filters from the filter cartridges shall only take place within the stabilization environment.

(27) The CVS and the engine may be turned off, if desired.

(b) The procedure in paragraph (a) of this section is designed for one sample bag for the cold start portion and one for the hot start portion.

(c) If a dynamometer test run is determined to be void, corrective action may be taken. The engine may then be allowed to cool (naturally or forced) and the dynamometer test rerun.

38. A new section 86.1338–2007 is added to Subpart N to read as follows:

§ 86.1338–2007 Emission measurement accuracy.

(a) *Minimum limit.* (1) The minimum limit of an analyzer must be equal to or less than one-half of the average diluted concentration for an engine emitting the maximum amount of the applicable pollutant allowed by the applicable standard. For example, if with a given dilution and sampling system, an engine emitting NO_X at the level of the standard (*e.g.,* 0.20 g/bhp-hr NO_X) would result in an average NO_X concentration of 1.0 ppm in the diluted sample, then the minimum limit for the NO_X analyzer must be less than or equal to 0.5 ppm.

(2) For the purpose of this section, ''minimum limit'' means the lowest of the following levels:

(i) The lowest NO_X concentration in the calibration curve for which an accuracy of ±2 percent of point has been demonstrated as specified in paragraph (a)(3) of this section; or

(ii) Any NO_X concentration for which the test facility has demonstrated sufficient accuracy to the Administrator's satisfaction prior to the start of testing, such that it will allow a meaningful determination of compliance with respect to the applicable standard.

(3) For determination of the analyzer's minimum limit, a NO_X concentration that is less than or equal to one-half of the average NO_X concentration determined in paragraph (a)(1) of this section shall be measured by the oxides of nitrogen analyzer following the analyzer's monthly periodic calibration. This measurement must be made to ensure the accuracy of the calibration curve to within ±2 percent of point accuracy of the appropriate least-squares fit, at less than or equal to one half of the average expected diluted NO_X concentration determined in paragraph (a)(1) of this section.

(b) *Measurement accuracy—Bag sampling.* Analyzers used for bag analysis must be operated such that the measured concentration falls between 15 and 100 percent of full scale, with the following exception: concentrations below 15 percent of full scale may be used if the minimum limit of the analyzer within the range meets the requirement of paragraph (a) of this section.

(c) *Measurement accuracy—Continuous measurement.* (1) Analyzers used for continuous analysis must be operated such that the measured concentration falls between 15 and 100 percent of full scale, with the following exceptions:

(i) Concentrations below 15 percent of full scale may be used if the minimum limit of the analyzer within the range meets the requirement of paragraph (a) of this section.

(ii) Analyzer response over 100% of full scale may be used if it can be shown that readings in this range are accurate.

(2) If the analyzer response exceeds the level allowed by paragraph (c)(1)(ii) of this section, the test must be repeated using a higher range and both results must be reported. The Administrator may waive this requirement.

(d) If a gas divider is used, the gas divider shall conform to the accuracy requirements specified in § 86.1314–84(g), and shall be used according to the procedures contained in paragraphs (a) and (b) of this section.

39. Section 86.1339–90 is amended by adding paragraph (h) to read as follows:

§ 86.1339–90 Particulate filter handling and weighing.

* * * * *

(h) This section does not apply for tests conducted according to the provisions of § 86.1312–2007.

40. Section 86.1360–2007 is amended by revising the section heading, adding introductory text, and revising paragraphs (b), (e)(2), (e)(3), and (e)(6)(ii), to read as follows:

§ 86.1360–2007 Supplemental emission test; test cycle and procedures.

The test procedures of this subpart N apply for supplemental emission testing, except as specified otherwise in this section.

* * * * *

(b) *Test cycle.* (1)(i) The following 13-mode cycle must be followed in dynamometer operation on the test engine:

Mode number	Engine speed	Percent load	Weighting factor	Mode length (minutes)
1	Idle	....	0.15	4
2	A	100	0.08	2
3	B	50	0.10	2
4	B	75	0.10	2
5	A	50	0.05	2
6	A	75	0.05	2
7	A	25	0.05	2
8	B	100	0.09	2
9	B	25	0.10	2
10	C	100	0.08	2
11	C	25	0.05	2
12	C	75	0.05	2
13	C	50	0.05	2

(ii) Upon Administrator approval, the manufacturer may use mode lengths other than those listed in paragraph (b)(1)(i) of this section.

(2) In addition to the 13 test points identified in paragraph (b)(1) of this section, for engines not certified to a NO_X standard or FEL less than1.5 g/bhp-hr, EPA may select, and require the manufacturer to conduct the test using, up to 3 additional test points within the control area (as defined in paragraph (d) of this section). EPA will notify the manufacturer of these supplemental test points in writing in a timely manner before the test. Emissions sampling for the additional test modes must include all regulated gaseous pollutants. Particulate matter does not need to be measured.

* * * * *

(e) * * *

(2) *Test sequence.* The test must be performed in the order of the mode numbers in paragraph (b)(1) of this section. Where applicable, the EPA-selected test points identified under paragraph (b)(2) of this section must be performed immediately upon completion of mode 13. The engine must be operated for the prescribed time in each mode, completing engine speed and load changes in the first 20 seconds of each mode. The specified speed must be held to within ±50 rpm and the specified torque must be held to within plus or minus two percent of the maximum torque at the test speed.

(3) *Particulate sampling.* One filter shall be used for sampling PM over the 13-mode test procedure. The modal weighting factors specified in paragraph (b)(1) of this section shall be taken into account by taking a sample proportional to the exhaust mass flow during each individual mode of the cycle. This can be achieved by adjusting sample flow rate, sampling time, and/or dilution ratio, accordingly, so that the criterion for the effective weighting factors is met. The sampling time per mode must be at least 4 seconds per 0.01 weighting factor. Sampling must be conducted as late as possible within each mode. Particulate sampling shall be completed no earlier than 5 seconds before the end of each mode.

* * * * *

(6) * * *

(ii) For PM measurements, a single filter must be used to measure PM over the 13 modes. The brake-specific PM emission level for the test must be calculated as described for a transient hot start test in § 86.1343. Only the power measured during the sampling period shall be used in the calculation.

* * * * *

41. Section 86.1370–2007 is amended by revising paragraphs (a), (b)(6) and (d), removing and reserving paragraph (b)(5), and adding paragraphs (b)(7) and (g) to read as follows:

§ 86.1370–2007 Not-To-Exceed test procedures.

(a) *General.* The purpose of this test procedure is to measure in-use emissions of heavy-duty diesel engines while operating within a broad range of speed and load points (the Not-To-Exceed Control Area) and under conditions which can reasonably be expected to be encountered in normal vehicle operation and use. Emission results from this test procedure are to be compared to the Not-To-Exceed Limits specified in § 86.007–11 (a)(4), or to later Not-To-Exceed limits. The Not-To-Exceed Limits do not apply for engine starting conditions.

(b) * * *

(5) [Reserved]

(6)(i) For petroleum-fueled diesel cycle engines, the manufacturer may identify particular engine-vehicle combinations and may petition the Administrator at certification to exclude operating points from the Not-to-Exceed Control Area defined in § 86.1370(b)(1) through (5) if the manufacturer can demonstrate that the engine is not capable of operating at such points when used in the specified engine-vehicle combination(s).

(ii) For diesel cycle engines that are not petroleum-fueled, the manufacturer may petition the Administrator at certification to exclude operating points from the Not-to-Exceed Control Area defined in § 86.1370(b)(1) through (5) if the manufacturer can demonstrate that the engine is not expected to operate at such points in normal vehicle operation and use.

(7) Manufacturers may petition the Administrator to limit NTE testing in a single defined region of speeds and loads. Such a defined region must generally be of elliptical or rectangular shape, and must share some portion of its boundary with the outside limits of the NTE zone. Under this provision testing would not be allowed with sampling periods in which operation within that region constitutes more than 5.0 percent of the time-weighted operation within the sampling period. Approval of this limit by the Administrator is contingent on the manufacturer satisfactorily demonstrating that operation at the

speeds and loads within that region accounts for less than 5.0 percent of all in-use operation (weighted by vehicle-miles-traveled or other EPA-approved weightings) for the in-use engines of that configuration (or sufficiently similar engines). At a minimum, this demonstration must include operational data from representative in-use vehicles.

* * * * *

(d) *Not-to-exceed control area limits.* (1) When operated within the Not-To-Exceed Control Area defined in paragraph (b) of this section, diesel engine emissions shall not exceed the applicable Not-To-Exceed Limits specified in § 86.007–11(a)(4) when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

(2) For engines equipped with emission controls that include discrete regeneration events, if a regeneration event occurs during the NTE test, then the averaging period must be at least as long as the time between the events multiplied by the number of full regeneration events within the sampling period. The requirement in this paragraph (d)(2) only applies for engines that send an electronic signal indicating the start of the regeneration event.

* * * * *

(g) *NO_X and NMHC aftertreatment warm-up.* For engines equipped with one or more aftertreatment devices that reduce NO_X or NMHC emissions, the NTE NO_X and NMHC emission limits do not apply when the exhaust gas temperature is measured within 12 inches of the outlet of the aftertreatment device and is less the 250°C. For multi-bed systems, it is the temperature at the outlet of the device with the maximum flow rate that determines whether the NTE limits apply.

42. § 86.1803–01 is amended by adding a definition of ''U.S. heavy-duty vehicle sales'' in alphabetical order to read as follows:

§ 86.1803–01 Definitions.

* * * * *

U.S. heavy-duty vehicle sales means sales of heavy-duty vehicles subject to the standards of this subpart, where the sale takes place in any state of the United States except for California (or a state that has adopted California motor vehicle standards for that model year pursuant to section 177 of the Clean Air Act).

* * * * *

43. § 86.1806–05 is amended by revising paragraphs (b) introductory text, (b)(1), and (l) to read as follows:

§ 86.1806–05 On-board diagnostics.

* * * * *

(b) *Malfunction descriptions.* The OBD system must detect and identify malfunctions in all monitored emission-related powertrain systems or components according to the following malfunction definitions as measured and calculated in accordance with test procedures set forth in subpart B of this part (chassis-based test procedures), excluding those test procedures defined as ''Supplemental'' test procedures in § 86.004–2 and codified in §§ 86.158, 86.159, and 86.160.

(1) *Catalysts and particulate traps.* (i) *Otto-cycle.* Catalyst deterioration or malfunction before it results in an increase in NMHC emissions 1.5 times the NMHC standard or FEL, as compared to the NMHC emission level measured using a representative 4000 mile catalyst system.

(ii) *Diesel.* (A) If equipped, catalyst deterioration or malfunction before it results in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NO_X or PM. This requirement applies only to reduction catalysts; monitoring of oxidation catalysts is not required. This monitoring need not be done if the manufacturer can demonstrate that deterioration or malfunction of the system will not result in exceedance of the threshold.

(B) If equipped with a particulate trap, catastrophic failure of the device must be detected. Any particulate trap whose complete failure results in exhaust emissions exceeding 1.5 times the applicable standard or FEL for NO_X or PM must be monitored for such catastrophic failure. This monitoring need not be done if the manufacturer can demonstrate that a catastrophic failure of the system will not result in exceedance of the threshold.

* * * * *

(l) *Phase-in for complete heavy-duty vehicles.* Complete heavy-duty vehicles weighing 14,000 pounds GVWR or less that are not Otto-cycle MDPVs must meet the OBD requirements of this section according to the following phase-in schedule, based on the percentage of projected vehicle sales. The 2004 model year requirements in the following phase-in schedule are applicable only to heavy-duty Otto-cycle vehicles where the manufacturer has selected Otto-cycle Option 1 or 2 for alternative 2003 or 2004 compliance according to § 86.004–01(c)(1) or (2). The 2005 through 2007 requirements in the following phase-in schedule apply to all heavy-duty vehicles weighing 14,000 pounds GVWR or less, excluding MDPVs. If the manufacturer has selected Otto-cycle Option 3 it may exempt 2005 model year complete heavy-duty engines and vehicles whose model year commences before July 31, 2004 from the requirements of this section. For the purposes of calculating compliance with the phase-in provisions of this paragraph (l), heavy-duty vehicles subject to the phase-in requirements of this section may be combined with heavy-duty vehicles subject to the phase-in requirements of paragraph § 86.005–17 (k). The phase-in schedule follows:

OBD COMPLIANCE PHASE-IN FOR COMPLETE HEAVY-DUTY VEHICLES WEIGHING 14,000 POUNDS GVWR OR LESS

Model year	Phase-in based on projected sales
2004 MY	Applicable only to Otto-cycle engines complying with Options 1 or 2; 40% compliance; alternative fuel waivers available.
2005 MY	60% compliance; alternative fuel waivers available.
2006 MY	80% compliance; alternative fuel waivers available.
2007 MY	80% compliance; alternative fuel waivers available.
2008+ MY	100% compliance.

44. A new § 86.1807–07 is added to subpart S to read as follows:

§ 86.1807–07 Vehicle labeling.

Section 86.1807–07 includes text that specifies requirements that differ from those specified in § 86.1807–01. Where a paragraph in § 86.1807–01 is identical and applicable to § 86.1807–07, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.1807–01.''.

(a) through (g) [Reserved]. For guidance see § 86.1807–01.

(h) Model year 2007 and later diesel-fueled Tier 2 vehicles (certified using a test fuel with 15 ppm sulfur or less), must include permanent readily visible labels on the dashboard (or instrument panel) and near all fuel inlets that state ''Use Low-sulfur Diesel Fuel Only'' or ''Low-sulfur Diesel Fuel Only''.

45. A new § 86.1808–07 is added to subpart S to read as follows:

§ 86.1808–07 Maintenance instructions.

Section 86.1808–07 includes text that specifies requirements that differ from those specified in § 86.1808–01. Where a paragraph in § 86.1808–01 is identical and applicable to § 86.1808–07, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.1808–01.''.

(a) through (f) [Reserved]. For guidance see § 86.1808–01.

(g) For each new diesel-fueled Tier 2 vehicle (certified using a test fuel with 15 ppm sulfur or less), the manufacturer shall furnish or cause to be furnished to the purchaser a statement that ''This vehicle must be operated only with low sulfur diesel fuel (that is., diesel fuel meeting EPA specifications for highway diesel fuel, including a 15 ppm sulfur cap).''.

46. Section 86.1810–01 is amended by revising the introductory text to read as follows:

§ 86.1810–01 General standards; increase in emissions; unsafe conditions; waivers.

This section applies to model year 2001 and later light-duty vehicles and light-duty trucks fueled by gasoline, diesel, methanol, natural gas and liquefied petroleum gas fuels. This section also applies to MDPVs and complete heavy-duty vehicles certified according to the provisions of this subpart. Multi-fueled vehicles (including dual-fueled and flexible-fueled vehicles) shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of flexible fueled vehicles). The standards of this subpart apply to both certification and in-use vehicles unless otherwise indicated. For Tier 2 and interim non-Tier 2 vehicles, this section also applies to hybrid electric vehicles and zero emission vehicles. Unless otherwise specified, requirements and provisions of this subpart applicable to methanol fueled vehicles are also applicable to Tier 2 and interim non-Tier 2 ethanol fueled vehicles.

* * * * *

47. Section 86.1816–05 is amended by revising paragraph (g) to read as follows:

§ 86.1816–05 Emission standards for complete heavy-duty vehicles.

* * * * *

(g) *Idle exhaust emission standards, complete heavy-duty vehicles.* Exhaust emissions of carbon monoxide from 2005 and later model year gasoline, methanol, natural gas-and liquefied petroleum gas-fueled complete heavy-duty vehicles shall not exceed 0.50 percent of exhaust gas flow at curb idle for a useful life of 11 years or 120,000 miles, whichever occurs first. This does not apply for vehicles certified to the requirements of § 86.1806–05

* * * * *

48. A new § 86.1816–08 is added to subpart S, to read as follows:

§ 86.1816–08 Emission standards for complete heavy-duty vehicles.

Section 86.1816–08 includes text that specifies requirements that differ from those specified in § 86.1816–05. Where a paragraph in § 86.1816–05 is identical and applicable to § 86.1816–08, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.1816–05.''. This section applies to 2008 and later model year complete heavy-duty vehicles (excluding MDPVs) fueled by gasoline, methanol, natural gas and liquefied petroleum gas fuels except as noted. Multi-fueled vehicles shall comply with all requirements established for each consumed fuel. For methanol fueled vehicles, references in this section to hydrocarbons or total hydrocarbons shall mean total hydrocarbon equivalents and references to non-methane hydrocarbons shall mean non-methane hydrocarbon equivalents.

(a) *Exhaust emission standards.* (1) Exhaust emissions from 2008 and later model year complete heavy-duty vehicles at and above 8,500 pounds Gross Vehicle Weight Rating but equal to or less than 10,000 Gross Vehicle Weight Rating pounds shall not exceed the following standards at full useful life:

(i) [Reserved]

(ii) *Non-methane hydrocarbons.* (A) 0.195 grams per mile; this requirement may be satisfied by measurement of non-methane organic gas or total hydrocarbons, at the manufacturer's option. For alcohol-fueled vehicles, this standard is 0.195 grams per mile NMHCE.

(B) A manufacturer may elect to include any or all of its test groups in the NMHC emissions ABT programs for heavy-duty vehicles, within the restrictions described in § 86.1817–05. or § 86.1817–08. If the manufacturer elects to include test groups in any of these programs, the NMHC FEL may not exceed 0.28 grams per mile. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading.

(iii) *Carbon monoxide.* 7.3 grams per mile.

(iv) *Oxides of nitrogen.* (A)0.2 grams per mile.

(B) A manufacturer may elect to include any or all of its test groups in the NO_X emissions ABT programs for heavy-duty vehicles, within the restrictions described in § 86.1817–05 or § 86.1817–08. If the manufacturer elects to include test groups in any of these programs, the NO_X FEL may not exceed 0.9 grams per mile. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading.

(v) *Particulate.* 0.02 grams per mile.

(vi) *Formaldehyde.* 0.032 grams per mile.

(2) Exhaust emissions from 2008 and later model year complete heavy-duty vehicles above 10,000 pounds Gross Vehicle Weight Rating but less than 14,000 pounds Gross Vehicle Weight Rating shall not exceed the following standards at full useful life:

(i) [Reserved]

(ii) *Non-methane hydrocarbons.* (A) 0.230 grams per mile; this requirement may be satisfied by measurement of non-methane organic gas or total hydrocarbons, at the manufacturer's option. For alcohol-fueled vehicles, this standard is 0.230 grams per mile NMHCE.

(B) A manufacturer may elect to include any or all of its test groups in the NMHC emissions ABT programs for heavy-duty vehicles, within the restrictions described in § 86.1817–05. or § 86.1817–08. If the manufacturer elects to include test groups in any of these programs, the NMHC FEL may not exceed 0.33 grams per mile. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading.

(iii) *Carbon monoxide.* 8.1 grams per mile.

(iv) *Oxides of nitrogen.* (A)0.4 grams per mile.

(B) A manufacturer may elect to include any or all of its test groups in the NO_X emissions ABT programs for heavy-duty vehicles, within the restrictions described in § 86.1817–05. or § 86.1817–08. If the manufacturer elects to include test groups in any of these programs, the NO_X FEL may not exceed 1.0 grams per mile. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading.

(v) *Particulate.* 0.02 grams per mile.

(vi) *Formaldehyde.* 0.040 grams per mile.

(b) [Reserved]

(c) [Reserved]

(d) *Evaporative emissions.* Evaporative hydrocarbon emissions from gasoline-fueled, natural gas-fueled, liquefied petroleum gas-fueled, and methanol-fueled complete heavy-duty vehicles shall not exceed the following standards. The standards apply equally to certification and in-use vehicles. The spitback standard also applies to newly assembled vehicles.

(1) For the full three-diurnal test sequence, diurnal plus hot soak measurements: 1.4 grams per test.

(2) Gasoline and methanol fuel only. For the supplemental two-diurnal test sequence, diurnal plus hot soak measurements: 1.75 grams per test.

(3) Gasoline and methanol fuel only. Running loss test: 0.05 grams per mile.

(4) Gasoline and methanol fuel only. Fuel dispensing spitback test: 1.0 grams per test.

(e) through (h) [Reserved]. For guidance see § 86.1816–05.

(i) *Phase-in options.* (1)(i) For model year 2008, manufacturers may certify some of their test groups to the standards applicable to model year 2008 vehicles under § 86.1816–05, in lieu of the exhaust standards specified in this section. These vehicles must comply with all other requirements applicable to model year 2007 vehicles. The combined number of vehicles in the test groups certified to the 2008 standards may not exceed 50 percent of the manufacturer's U.S. heavy-duty vehicle sales of complete heavy-duty Otto-cycle motor vehicles for model year 2008, except as explicitly allowed by paragraph (i)(2) of this section.

(ii) For model year 2008, manufacturers may certify some of their test groups to the evaporative standards applicable to model year 2007 engines under § 86.1816–05, in lieu of the evaporative standards specified in this section. These vehicles must comply with all other requirements applicable to model year 2008 vehicles, except as allowed by paragraph (i)(1)(i) of this section. The combined number of vehicles in the test groups certified to the 2007 standards may not exceed 50 percent of the manufacturer's U.S. heavy-duty vehicle sales of complete heavy-duty Otto-cycle motor vehicles for model year 2008.

(2)(i) Manufacturers certifying vehicles to all of the applicable standards listed in paragraph (a) of this section prior to model year 2008 (without using credits) may reduce the number of vehicles that are required to meet the standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (i)(1) of this section. For every vehicle that is certified early, the manufacturer may reduce the number of vehicles that are required by paragraph (i)(1) of this section to meet the standards listed in paragraph (a) of this section by one vehicle. For example, if a manufacturer produces 100 heavy-duty Otto-cycle vehicles in 2007 that meet all of the applicable the standards listed in paragraph (a) of this section, and it produced 10,000 heavy-duty Otto-cycle vehicles in 2009, then only 9,900 of the vehicles would need to comply with the standards listed in paragraph (a) of this section.

(ii) Manufacturers certifying vehicles to all of the applicable evaporative standards listed in paragraph (d) of this section prior to model year 2008 may reduce the number of vehicles that are required to meet the standards listed in paragraph (d) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (i)(1) of this section. For every vehicle that is certified early, the manufacturer may reduce the number of vehicles that are required by paragraph (i)(1) of this section to meet the evaporative standards listed in paragraph (d) of this section by one vehicle.

(3) Manufacturers certifying vehicles to all of the applicable standards listed in paragraph (i)(3)(i) or (ii) of this section (without using credits) and the evaporative standards listed in paragraph (d) of this section prior to model year 2008 may reduce the number of vehicles that are required to meet the standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (i)(1)(i) of this section. For every such vehicle that is certified early with sufficiently low emissions, the manufacturer may reduce the number of vehicles that are required by paragraph (i)(1)(i) of this section to meet the standards listed in paragraph (a) of this section by two vehicles. The applicable standards are:

(i) For complete heavy-duty vehicles at and above 8,500 pounds Gross Vehicle Weight Rating but equal to or less than 10,000 Gross Vehicle Weight Rating: 0.100 g/mile NMHC, 0.10 g/mile NO_X, 3.2 g/mile CO, 0.008 g/mile formaldehyde, and 0.02 g/mile PM.

(ii) For complete heavy-duty vehicles at or above 10,000 pounds Gross Vehicle Weight Rating but equal to or less than 14,000 Gross Vehicle Weight Rating: 0.117 g/mile NMHC, 0.20 g/mile NO_X, 3.7 g/mile CO, 0.010 g/mile formaldehyde, and 0.02 g/mile PM.

(j) (1) For model years prior to 2012, for purposes of determining compliance after title or custody has transferred to the ultimate purchaser, for vehicles meeting the applicable emission standards of this section, the applicable compliance limits shall be determined by adding the applicable adjustment from paragraph (j)(2) of this section to the otherwise applicable standard or FEL.

(2) The in-use adjustments are:

(i) 0.1 g/bhp-hr for NO_X.

(ii) 0.100 g/bhp-hr NMHC.

(iii) 0.01 g/bhp-hr for PM.

49. A new § 86.1817–08 is added to Subpart S to read as follows:

§ 86.1817–08 Complete heavy-duty vehicle averaging, trading, and banking program.

Section 86.1817–08 includes text that specifies requirements that differ from § 86.1817–05. Where a paragraph in § 86.1817–05 is identical and applicable to § 86.1817–08, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.1817–05.''

(a) through (o) [Reserved]. For guidance see § 86.1817–05.

(p) The following provisions apply for model year 2008 and later engines. These provisions apply instead of the provisions of paragraphs § 86.1817–05 (a) through (o) to the extent that they are in conflict.

(1) Manufacturers of Otto-cycle vehicles may participate in an NMHC averaging, banking and trading program to show compliance with the standards specified in § 86.1806–08. The generation and use of NMHC credits are subject to the same provisions in paragraphs § 86.1817–05 (a) through (o) that apply for NO_X credits, except as otherwise specified in this section.

(2) NO_X or NMHC (or NO_X plus NMHC) credits may be exchanged between heavy-duty Otto-cycle test groups certified to the engine standards of subpart A of this part and heavy-duty Otto-cycle test groups certified to the chassis standards of this subpart, subject to an 0.8 discount factor (e.g., 100 grams of NO_X credits generated from vehicles would be equivalent to 80 grams of NO_X credits if they are used in the engine program of subpart A of this part, and vice versa). Credits that were previously discounted when they were banked according to § 86.1817–05(c), are subject to an additional discount factor of 0.888 instead of the 0.8 discount factor otherwise required by this paragraph (p)(2). This results in a total discount of 0.8 ($0.9 \times 0.888 = 0.8$).

(3) Credits are to be rounded to the nearest one-hundredth of a Megagram.

(4) To calculate credits relative to the NO_X standards listed in § 86.1816–08 (a)(1)(iv)(A) or (a)(2)(iv)(A) (0.2 or 0.4 grams per mile, respectively) express the standard and FEL to the nearest one-hundredth of a gram per mile prior to calculating the credits. Thus, either 0.20 or 0.40 should be used as the value for ''Std''.

(5) Credits generated for 2008 and later model year test groups are not discounted (except as specified in § 86.1817–05(c) and paragraph (p)(2) of this section), and do not expire.

(6) For the purpose of using or generating credits during a phase-in of new standards, a manufacturer may elect to split an test group into two subgroups: one which uses credits and one which generates credits. The manufacturer must indicate in the application for certification that the test group is to be split, and may assign the numbers and configurations of vehicles within the respective subfamilies at any time prior to the submission of the end-of-year report described in § 86.1817–05 (i)(3). Manufacturers certifying a split test group may label all of the vehicles within that test group with the same FELs: either with a NO_X FEL and an NMHC FEL, or with a single NO_X+NMHC FEL. The FEL(s) on the label will apply for all SEA or other compliance testing.

(7) Vehicles meeting all of the applicable standards of § 86.1816–08 prior to model year 2008 may generate NMHC credits for use by 2008 or later test groups. Credits are calculated according to § 86.1817–05(c), except that the applicable FEL cap listed in § 86.1816–08(a)(1)(ii)(B) or (2)(ii)(B) applies instead of ''Std'' (the applicable standard).

50. A new § 86.1824–07 is added to subpart S, to read as follows:

§ 86.1824–07 Durability demonstration procedures for evaporative emissions.

§ 86.1824–07 includes text that specifies requirements that differ from those specified in § 86.1824–01. Where a paragraph in § 86.1824–01 is identical and applicable to § 86.1824–07, this may be indicated by specifying the corresponding paragraph and the statement ''[Reserved]. For guidance see § 86.1824–01.''. This section applies to gasoline-, methanol-, natural gas- and liquefied petroleum gas-fueled LDV/Ts, MDPVs, and HDVs.

(a) through (f) [Reserved]. For guidance see § 86.1824–01.

51. § 86.1829–01 is amended by revising paragraph (b)(1)(iii)(B) and adding paragraph (b)(1)(iii)(F) to read as follows:

§ 86.1829–01 Durability and emission testing requirements; waivers.

* * * * *

(b) * * *

(1) * * *

(iii)* * *

(B) In lieu of testing an Otto-cycle light-duty vehicle, light-duty truck, or heavy-duty vehicle for particulate emissions for certification, a manufacturer may provide a statement in its application for certification that such vehicles comply with the applicable standards. Such a statement must be based on previous emission tests, development tests, or other appropriate information.

* * * * *

(F) In lieu of testing a petroleum-fueled heavy-duty vehicle for formaldehyde emissions for certification, a manufacturer may provide a statement in its application for certification that such vehicles comply with the applicable standards. Such a statement must be based on previous emission tests, development tests, or other appropriate information.

* * * * *

52. A new § 86.1863–07 is added to subpart S, to read as follows:

§ 86.1863–07 Optional chassis certification for diesel vehicles.

(a) A manufacturer may optionally certify heavy-duty diesel vehicles under 14,000 pounds GVWR to the standards specified in § 86.1816–08. Such vehicles must meet all requirements of Subpart S that are applicable to Otto-cycle vehicles, except for evaporative, refueling, and OBD requirements.

(b) Diesel vehicles optionally certified under this section are subject to the OBD requirements of § 86.005–17.

(c) Diesel vehicles optionally certified under this section may be tested using the test fuels, sampling systems, or analytical systems specified for diesel engines in Subpart N of this part.

(d) Diesel vehicles optionally certified under this section may not be included in any averaging, banking, or trading program.

(e) The provisions of § 86.004–40 apply to the engines in vehicles certified under this section.

(f) Diesel vehicles may be certified under this section to the standards applicable to model year 2008 prior to model year 2008.

(g) Diesel vehicles optionally certified under this section in model years 2007, 2008, or 2009 shall be included in phase-in calculations specified in § 86.007–11(g).

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