

TABLE C94-5.2.—CREDIT GENERATION: PURCHASING A ULEV OR ZEV TO MEET THE MANDATE

| CO | Light HDV | Medium HDV |
|------------|-----------|------------|
| LEV | 0.00 | 0.00 |
| ULEV | 1.00 | 1.00 |
| ZEV | 2.00 | 2.00 |

TABLE C94-5.3.—CREDIT NEEDED IN LIEU OF PURCHASING A LEV TO MEET THE MANDATE

| CO | Light HDV | Medium HDV |
|-----------|-----------|------------|
| LEV | 1.00 | 1.00 |

[58 FR 11901, Mar. 1, 1993, as amended at 59 FR 50082, Sept. 30, 1994, 61 FR 128, Jan. 3, 1996]

PART 89—CONTROL OF EMISSIONS FROM NEW AND IN-USE NONROAD ENGINES

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AUTHORITY: Sections 202, 203, 204, 205, 206, 207, 208, 209, 213, 215, 216, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7547, 7549, 7550, and 7601(a)).

SOURCE: 59 FR 31335, June 17, 1994, unless otherwise noted.

Subpart A—General

§ 89.1 Applicability.

(a) This part applies to nonroad compression-ignition engines that have a gross power output at or above 37 kilowatts (kW) and that are used for any purpose.

(b) The following nonroad engines are not subject to the provisions of this part:

(1) Engines used in aircraft as defined in § 87.1(a) of this chapter;

(2) Engines used in underground mining or engines used in underground mining equipment and regulated by the Mining Safety and Health Administration (MSHA) in 30 CFR parts 7, 31, 32, 36, 56, 57, 70, and 75;

(3) Engines subject to the standards of 40 CFR part 92 (engines exempted from the requirements of 40 CFR part 92 under 40 CFR 92.907 are subject to the requirements of this part 89); and

(4) Engines used in marine vessels as defined in the General Provisions of the United States Code, 1 U.S.C. 3 (1992).

[59 FR 31335, June 17, 1994, as amended at 63 FR 18998, Apr. 16, 1998]

§ 89.2 Definitions.

The following definitions apply to part 89. All terms not defined herein have the meaning given them in the Act.

Act means the Clean Air Act, as amended, 42 U.S.C. 7401 *et seq.*

Adjustable parameter means any device, system, or element of design which is physically capable of being adjusted (including those which are difficult to access) and which, if adjusted, may affect emissions or engine performance during emission testing.

Administrator means the Administrator of the Environmental Protection Agency or his or her authorized representative.

Auxiliary emission control device (AECD) means any element of design that senses temperature, vehicle speed, engine RPM, transmission gear, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.

Certification means, with respect to new nonroad engines, obtaining a certificate of conformity for an engine family complying with the nonroad engine emission standards and requirements specified in this part.

Emission control system means any device, system, or element of design which controls or reduces the emission of substances from an engine.

Engine, as used in this part, refers to nonroad engine.

Engine manufacturer means any person engaged in the manufacturing or assembling of new nonroad engines or importing such engines for resale, or who acts for and is under the control of any such person in connection with the distribution of such engines. Engine manufacturer does not include any dealer with respect to new nonroad engines received by such person in commerce.

Engine used in a locomotive means either an engine placed in the locomotive to move other equipment, freight, or passenger traffic, or an engine mounted on the locomotive to provide auxiliary power.

EPA enforcement officer means any officer or employee of the Environmental Protection Agency so designated in

writing by the Administrator (or by his or her designee).

Family emission limit (FEL) means an emission level that is declared by the manufacturer to serve in lieu of an emission standard for certification purposes and for the averaging, banking, and trading program. A FEL must be expressed to the same number of decimal places as the applicable emission standard.

Gross power means the power measured at the crankshaft or its equivalent, the engine being equipped only with the standard accessories (such as oil pumps, coolant pumps, and so forth) necessary for its operation on the test bed. Alternators must be used, if necessary, to run the engine. Fans, air conditioners, and other accessories may be used at the discretion of the manufacturer, but no power adjustments for these accessories may be made.

Identification number means a specification (for example, model number/serial number combination) which allows a particular nonroad engine to be distinguished from other similar engines.

Model year (MY) means the manufacturer's annual new model production period which includes January 1 of the calendar year, ends no later than December 31 of the calendar year, and does not begin earlier than January 2 of the previous calendar year. Where a manufacturer has no annual new model production period, model year means calendar year.

New, for purposes of this part, means a nonroad engine, nonroad vehicle, or nonroad equipment the equitable or legal title to which has never been transferred to an ultimate purchaser until after the engine, vehicle, or equipment is placed into service, then the engine, vehicle, or equipment will no longer be new after it is placed into service. A nonroad engine, vehicle, or equipment is placed into service when it is used for its functional purposes. With respect to imported nonroad engines, nonroad vehicles, or nonroad equipment, the term "new" means an engine, vehicle, or piece of equipment that is not covered by a certificate of conformity issued under this part at the time of importation, and that is

manufactured after the effective date of a regulation issued under this part which is applicable to such engine, vehicle, or equipment (or which would be applicable to such engine, vehicle, or equipment had it been manufactured for importation into the United States).

Nonroad compression-ignition engine means a nonroad engine which utilizes the compression-ignition combustion cycle.

Nonroad engine means:

(1) Except as discussed in paragraph (2) of this definition, a nonroad engine is any internal combustion engine:

(i) in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers); or

(ii) in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or

(iii) that, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.

(2) An internal combustion engine is not a nonroad engine if:

(i) the engine is used to propel a motor vehicle or a vehicle used solely for competition, or is subject to standards promulgated under section 202 of the Act; or

(ii) the engine is regulated by a federal New Source Performance Standard promulgated under section 111 of the Act; or

(iii) the engine otherwise included in paragraph (1)(iii) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a

seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two years) and that operates at that single location approximately three months (or more) each year. This paragraph does not apply to an engine after the engine is removed from the location.

Nonroad equipment means equipment that is powered by nonroad engines.

Nonroad vehicle means a vehicle that is powered by a nonroad engine as defined in this section and that is not a motor vehicle or a vehicle used solely for competition.

Nonroad vehicle or nonroad equipment manufacturer means any person engaged in the manufacturing or assembling of new nonroad vehicles or equipment or importing such vehicles or equipment for resale, or who acts for and is under the control of any such person in connection with the distribution of such vehicles or equipment. A nonroad vehicle or equipment manufacturer does not include any dealer with respect to new nonroad vehicles or equipment received by such person in commerce.

Opacity means the fraction of a beam of light, expressed in percent, which fails to penetrate a plume of smoke.

Operating hours means:

(1) For engine storage areas or facilities, all times during which personnel other than custodial personnel are at work in the vicinity of the storage area or facility and have access to it.

(2) For all other areas or facilities, all times during which an assembly line is in operation or all times during which testing, maintenance, service accumulation, production or compilation of records, or any other procedure or activity related to certification testing, to translation of designs from the test stage to the production stage, or to engine manufacture or assembly is being carried out in a facility.

Presentation of credentials means the display of the document designating a person as an EPA enforcement officer or EPA authorized representative.

Test fleet means the engine or group of engines that a manufacturer uses

during certification to determine compliance with emission standards.

Ultimate purchaser means, with respect to any new nonroad engine, new nonroad vehicle, or new nonroad equipment, the first person who in good faith purchases such new nonroad engine, nonroad vehicle, or nonroad equipment for purposes other than resale.

Used solely for competition means exhibiting features that are not easily removed and that would render its use other than in competition unsafe, impractical, or highly unlikely.

[59 FR 31335, June 17, 1994, as amended at 61 FR 52102, Oct. 4, 1996; 63 FR 18998, Apr. 16, 1998]

§ 89.3 Acronyms and abbreviations.

The following acronyms and abbreviations apply to part 89.

| | |
|-----------------|---|
| AECD | Auxiliary emission control device. |
| ASME | American Society of Mechanical Engineers. |
| ASTM | American Society for Testing and Materials. |
| CAA | Clean Air Act. |
| CAAA | Clean Air Act Amendments of 1990. |
| CI | Compression-ignition. |
| CO | Carbon monoxide. |
| CO ₂ | Carbon dioxide. |
| EPA | Environmental Protection Agency. |
| FEL | Family emission limit. |
| FTP | Federal Test Procedure. |
| g/kW-hr | Grams per kilowatt hour. |
| HC | Hydrocarbons. |
| ICI | Independent Commercial Importer. |
| kW | Kilowatt. |
| NIST | National Institute for Standards and Testing. |
| NTIS | National Technical Information Service. |
| NO | Nitric oxide. |
| NO ₂ | Nitrogen dioxide. |
| NO _x | Oxides of nitrogen. |
| O ₂ | Oxygen. |
| OEM | Original equipment manufacturer. |
| SAE | Society of Automotive Engineers. |
| SEA | Selective Enforcement Auditing. |

SI Spark-ignition.
 U.S.C. United States Code.
 VOC Volatile organic com-
 pounds.

The table title will indicate the model year (if applicable) and the topic.

(b) Figures for each subpart appear in an appendix at the end of the subpart. Figures are numbered consecutively by order of appearance in the appendix. The figure title will indicate the model year (if applicable) and the topic.

§89.4 Section numbering.

(a) Sections are numbered sequentially by subpart.

(b) Where two different standards or requirements are concurrently applicable, the model year of applicability is indicated by the number following the main section number. The two digits following the hyphen designate the first model year for which a section is effective.

Example: Section 89.304–96 applies to the 1996 and subsequent model years until superseded. If a §89.304–98 is promulgated, it would take effect beginning with the 1998 model year; §89.304–96 would apply to model years 1996 through 1997. Therefore, in calendar year 1997, a manufacturer may be certifying both 1997 and 1998 model year engines, requiring the use of different requirements concurrently.

NOTE: Model year 2000 and later will appear sequentially with 1999 and earlier based on the order of the last two digits of the year, not in calendar year order; that is, §89.304–03 will appear before §89.304–99.

(c) A section without the model year designation is applicable to all model years as designated in the applicability section for the subpart or part or in the text of the section.

§89.5 Table and figure numbering; position.

(a) Tables for each subpart appear in an appendix at the end of the subpart. Tables are numbered consecutively by order of appearance in the appendix.

§89.6 Reference materials.

(a) *Incorporation by reference.* The documents in paragraph (b) of this section have been incorporated by reference. The incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at US EPA, OAR, 401 M Street SW., Washington, DC 20460, or at the Office of the Federal Register, 800 N. Capitol Street NW., Suite 700, Washington, DC.

(b) The following paragraphs and tables set forth the material that has been incorporated by reference in this part.

(1) *ASTM material.* The following table sets forth material from the American Society for Testing and Materials which 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 §89.6, in which the matter is referenced. The second column is presented for information only and may not be all inclusive. Copies of these materials may be obtained from American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103.

| Document number and name | 40 CFR part 89 reference |
|---|--------------------------|
| ASTM D86–90: Standard Test Method for Distillation of Petroleum Products | Appendix A to Subpart D. |
| ASTM D93–90: Standard Test Methods for Flash Point by Pensky-Martens Closed Tester | Appendix A to Subpart D. |
| ASTM D129–91: Standard Test Method for Sulfur in Petroleum Products (General Bomb Method) | Appendix A to Subpart D. |
| ASTM D287–92: Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method). | Appendix A to Subpart D. |
| ASTM D445–88: Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity). | Appendix A to Subpart D. |
| ASTM D613–86: Standard Test Method for Ignition Quality of Diesel Fuels by the Cetane Method | Appendix A to Subpart D. |
| ASTM D1319–89: Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption. | Appendix A to Subpart D. |
| ASTM D2622–92: Standard Test Method for Sulfur in Petroleum Products by X-ray Spectrometry ... | Appendix A to Subpart D. |

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| Document number and name | 40 CFR part 89 reference |
|---|--------------------------|
| ASTM E29-90: Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications. | 89.207-96; 89.509-96. |

(2) *SAE material.* The following table sets forth material from the Society of Automotive Engineers which 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 §89.6, in which the matter is ref-

erenced. The second column is presented for information only and may not be all inclusive. Copies of these materials may be obtained from Society of Automotive Engineers International, 400 Commonwealth Dr., Warrendale, PA 15096-0001.

| Document number and name | 40 CFR part 89 reference |
|--|--------------------------|
| SAE J244 June 83: Recommended Practice for Measurement of Intake Air or Exhaust Gas Flow of Diesel Engines | 89.416-96 |
| SAE J1937 November 89: Recommended Practice for Engine Testing with Low Temperature Charge Air Cooler Systems in a Dynamometer Test Cell | 89.327-96 |
| SAE Paper 770141: Optimization of a Flame Ionization Detector for Determination of Hydrocarbon in Diluted Automotive Exhausts, Glenn D. Reschke | 89.319-96 |

(3) *California Air Resources Board Test Procedure.* The following table sets forth material from the Title 13, California Code of Regulations, Sections 2420-2427, as amended by California Air Resources Board Resolution 92-2 and published in California Air Resources Board mail out #93-42, September 1, 1993) which 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 §89.6, in which the matter is referenced. The second column is presented for information only and may not be all inclusive. Copies of these materials may be obtained from California Air Resources Board, Haagen-Smit Laboratory, 9528 Telstar Avenue, El Monte, CA 91731-2990.

| Document number and name | 40 CFR part 89 reference |
|--|-------------------------------------|
| California Regulations for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines | 89.112-96 89.119-96 89.508-96 |

§89.7 Treatment of confidential information.

(a) Any manufacturer may assert that some or all of the information submitted pursuant to this part is entitled to confidential treatment as provided by part 2, subpart B of this chapter.

(b) Any claim of confidentiality must accompany the information at the time it is submitted to EPA.

(c) To assert that information submitted pursuant to this part is confidential, a manufacturer must indicate clearly the items of information

claimed confidential by marking, circling, bracketing, stamping, or otherwise specifying the confidential information. Furthermore, EPA requests, but does not require, that the submitter also provide a second copy of its submittal from which all confidential information has been deleted. If a need arises to publicly release nonconfidential information, EPA will assume that the submitter has accurately deleted the confidential information from this second copy.

(d) If a claim is made that some or all of the information submitted pursuant

to this part is entitled to confidential treatment, the information covered by that confidentiality claim will be disclosed by the Administrator only to the extent and by means of the procedures set forth in part 2, subpart B of this chapter.

(e) Information provided without a claim of confidentiality at the time of submission may be made available to the public by EPA without further notice to the submitter, in accordance with §2.204(c)(2)(i)(A) of this chapter.

APPENDIX A TO SUBPART A—STATE REGULATION OF NONROAD INTERNAL COMBUSTION ENGINES

This appendix sets forth the Environmental Protection Agency's (EPA's) interpretation of the Clean Air Act regarding the authority of states to regulate the use and operation of nonroad engines.

EPA believes that states are not precluded under section 209 from regulating the use and operation of nonroad engines, such as regulations on hours of usage, daily mass emission limits, or sulfur limits on fuel; nor are permits regulating such operations precluded, once the engine is no longer new. EPA believes that states are precluded from requiring retrofitting of used nonroad engines except that states are permitted to adopt and enforce any such retrofitting requirements identical to California requirements which have been authorized by EPA under section 209 of the Clean Air Act.

[62 FR 67736, Dec. 30, 1997]

Subpart B—Emission Standards and Certification Provisions

§89.101–96 Applicability.

The requirements of subpart B are applicable to all new nonroad compression-ignition engines subject to the provisions of subpart A of part 89, pursuant to the schedule delineated in §89.102–96.

§89.102–96 Effective dates, optional inclusion.

(a) This subpart applies to all engines described in §89.101–96 with the following gross power output and manufactured after the following dates:

(1) Greater than or equal to 37 kW but less than 75 kW and manufactured on or after January 1, 1998;

(2) Greater than or equal to 75 kW but less than 130 kW and manufactured on or after January 1, 1997;

(3) Greater than or equal to 130 kW but less than or equal to 560 kW and manufactured on or after January 1, 1996;

(4) Greater than 560 kW and manufactured on or after January 1, 2000.

(b) A manufacturer can optionally certify engines manufactured up to one calendar year prior to the effective date of mandatory certification to earn emission credits under the averaging, banking, and trading program. Such optionally certified engines are subject to all provisions relating to mandatory certification and enforcement described in this part.

§89.103–96 Definitions.

The definitions in subpart A of part 89 apply to this subpart. All terms not defined herein or in subpart A have the meaning given them in the Act.

§89.104–96 Useful life, recall, and warranty periods.

(a) The useful life is a period of 8,000 hours of operation or ten years of use, whichever first occurs.

(b) Engines are subject to recall testing for a period of 6,000 hours of operation or seven years of use, whichever first occurs. However, in a recall, engines in the subject class or category must be recalled regardless of actual years or hours of operation.

(c) Warranties imposed by the Clean Air Act are for 3,000 hours of operation or five years of use, whichever first occurs.

(d) Manufacturers may apply to the Administrator for approval for a shorter useful life period for engines that are subject to severe service in seasonal equipment, or are designed specifically for lower useful life hours to match equipment life. Such an application must be made prior to certification.

§89.105–96 Certificate of conformity.

Every manufacturer of a new nonroad compression-ignition engine must obtain a certificate of conformity covering the engine family, as described in §89.116–96. The certificate of conformity must be obtained from the

Administrator prior to selling, offering for sale, introducing into commerce, or importing into the United States the new nonroad compression-ignition engine for each model year.

§ 89.106-96 Prohibited controls.

(a) An engine may not be equipped with an emission control system for the purpose of complying with emission standards if such system will cause or contribute to an unreasonable risk to public health, welfare, or safety in its operation or function.

(b) An engine with an emission control system may not emit any noxious or toxic substance which would not be emitted in the operation of such engine in the absence of such system except as specifically permitted by regulation.

§ 89.107-96 Defeat devices.

(a) An engine may not be equipped with a defeat device.

(b) For purposes of this section, "defeat device" means any device, system, or element of design which senses operation outside normal emission test conditions and reduces emission control effectiveness.

(1) Defeat device includes any auxiliary emission control device (AECD) that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal operation and use unless such conditions are included in the test procedure.

(2) Defeat device does not include such items which either operate only during engine starting or are necessary to protect the engine (or equipment in which it is installed) against damage or accident during its operation.

§ 89.108-96 Adjustable parameters, requirements.

(a) Nonroad engines equipped with adjustable parameters must comply with all requirements of this subpart for any adjustment in the physically adjustable range.

(b) An operating parameter is not considered adjustable if it is permanently sealed or otherwise not normally accessible using ordinary tools.

(c) The Administrator may require that adjustable parameters be set to any specification within its adjustable

range for certification, selective enforcement audit, or in-use testing to determine compliance with the requirements of this subpart.

§ 89.109-96 Maintenance instructions.

The manufacturer must furnish or cause to be furnished to the ultimate purchaser of each new nonroad engine written instructions for the maintenance needed to assure proper functioning of the emission control system.

§ 89.110-96 Emission control information label.

(a) The manufacturer must affix at the time of manufacture a permanent and legible label identifying each nonroad engine. The label must meet the following requirements:

(1) Be attached in such a manner that it cannot be removed without destroying or defacing the label;

(2) Be durable and readable for the entire engine life;

(3) Be secured to an engine part necessary for normal engine operation and not normally requiring replacement during engine life;

(4) Be written in English; and

(5) Be located so as to be readily visible to the average person after the engine is installed in the equipment. A supplemental label meeting all the requirements of this section may be attached to a location other than the engine, in cases where the required label must be obscured after the engine is installed in the equipment.

(b) The label must contain the following information:

(1) The heading "Important Engine Information;"

(2) The full corporate name and trademark of the manufacturer;

(3) EPA standardized engine family designation;

(4) Engine displacement;

(5) Advertised power;

(6) Engine tuneup specifications and adjustments. These should indicate the proper transmission position during tuneup, and accessories (for example, air conditioner), if any, that should be in operation;

(7) Fuel requirements;

(8) Date of manufacture (month and year). The manufacturer may, in lieu of including the date of manufacture

on the engine label, maintain a record of the engine manufacture dates. The manufacturer shall provide the date of manufacture records to the Administrator upon request;

(9) Family emission limits (FELs) if applicable; and

(10) The statement: "This engine conforms to [model year] U.S. EPA regulations large nonroad compression-ignition engines."

(c) Other information concerning proper maintenance and use or indicating compliance or noncompliance with other standards may be indicated on the label.

(d) Each engine must have a legible unique engine identification number permanently affixed to or engraved on the engine.

§ 89.111-96 Averaging, banking, and trading of exhaust emissions.

Regulations regarding the availability of an averaging, banking, and trading program along with applicable record-keeping requirements are found in subpart C of this part. Participation in the averaging, banking, and trading program is optional.

§ 89.112-96 Oxides of nitrogen, carbon monoxide, hydrocarbon, and particulate matter exhaust emission standards.

(a) Nonroad engines to which this subpart is applicable must meet the following exhaust emission standards:

(1) Exhaust emissions of oxides of nitrogen shall not exceed 9.2 grams per kilowatt hour (g/kW-hr).

(2) Exhaust emissions of carbon monoxide shall not exceed 11.4 g/kW-hr for engines at and above 130 kW.

(3) Exhaust emissions of hydrocarbon shall not exceed 1.3 g/kW-hr for engines at and above 130 kW.

(4) Exhaust emissions of particulate matter shall not exceed 0.54 g/kW-hr for engines at and above 130 kW.

(b) Exhaust emission of oxides of nitrogen, carbon monoxide, and hydrocarbon is measured using the procedures set forth in subpart E of this part.

(c) Exhaust emission of particulate matter is measured using the California Regulations for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle En-

gines. This procedure is incorporated by reference. See § 89.6.

(d) In lieu of the standard specified in paragraph (a)(1) of this section, manufacturers may elect to include engine families in the averaging, banking, and trading program, the provisions of which are specified in subpart C of this part. The manufacturer must set a family emission limit (FEL) not to exceed 14.6 grams per kilowatt hour. This FEL serves as the standard for that family.

§ 89.113-96 Smoke emission standard.

(a) Exhaust opacity from compression-ignition nonroad engines for which this subpart is applicable must not exceed:

(1) 20 percent during the acceleration mode;

(2) 15 percent during the lugging mode; and

(3) 50 percent during the peaks in either the acceleration or lugging modes.

(b) Opacity levels are to be measured and calculated as set forth in part 86, subpart I.

§ 89.114-96 Special test procedures.

(a) *Use of special test procedures by EPA.* The Administrator may, on the basis of written application by a manufacturer, establish special test procedures other than those set forth in this part, for any nonroad engine that the Administrator determines is not susceptible to satisfactory testing under the specified test procedures set forth in subpart E of this part or part 86, subpart I.

(b) *Use of alternate test procedures by manufacturer.*

(1) A manufacturer may elect to use an alternate test procedure provided that it yields equivalent results to the specified procedures, its use is approved in advance by the Administrator, and the basis for equivalent results with the specified test procedures is fully described in the manufacturer's application.

(2) The Administrator may reject data generated under alternate test procedures which do not correlate with data generated under the specified procedures.

§ 89.115-96 Application for certificate.

(a) For each engine family that complies with all applicable standards and requirements, the engine manufacturer must submit to the Administrator a completed application for a certificate of conformity.

(b) The application must be approved and signed by the authorized representative of the manufacturer.

(c) The application will be updated and corrected by amendment as provided for in § 89.123-96 to accurately reflect the manufacturer's production.

(d) *Required content.* Each application must include the following information:

(1) A description of the basic engine design including, but not limited to, the engine family specifications, the provisions of which are contained in § 89.116-96;

(2) An explanation of how the emission control system operates, including a detailed description of all emission control system components, each auxiliary emission control device (AECD), and all fuel system components to be installed on any production or test engine(s);

(3) Proposed test fleet selection and the rationale for the test fleet selection;

(4) Special or alternate test procedures, if applicable;

(5) The period of operation necessary to accumulate service hours on test engines and stabilize emission levels;

(6) A description of all adjustable operating parameters (including, but not limited to, injection timing and fuel rate), including the following:

(i) The nominal or recommended setting and the associated production tolerances;

(ii) The intended physically adjustable range;

(iii) The limits or stops used to establish adjustable ranges;

(iv) Production tolerances of the limits or stops used to establish each physically adjustable range; and

(v) Information relating to why the physical limits or stops used to establish the physically adjustable range of each parameter, or any other means used to inhibit adjustment, are effective in preventing adjustment of parameters to settings outside the manu-

facturer's intended physically adjustable ranges on in-use engines;

(7) For families participating in the averaging, banking, and trading program, the information specified in subpart C of this part;

(8) A description of the test equipment and fuel proposed to be used;

(9) All test data obtained by the manufacturer on each test engine;

(10) An unconditional statement certifying that all engines in the engine family comply with all requirements of this part and the Clean Air Act.

(e) At the Administrator's request, the manufacturer must supply such additional information as may be required to evaluate the application including, but not limited to, projected nonroad engine production.

(f)(1) The Administrator may modify the information submission requirements of paragraph (d) of this section, provided that all of the information specified therein is maintained by the engine manufacturer as required by § 89.124-96, and amended, updated, or corrected as necessary.

(2) For the purposes of this paragraph, § 89.124-96(a)(1) includes all information specified in paragraph (d) of this section whether or not such information is actually submitted to the Administrator for any particular model year.

(3) The Administrator may review an engine manufacturer's records at any time. At the Administrator's discretion, this review may take place either at the manufacturer's facility or at another facility designated by the Administrator.

[59 FR 31335, June 17, 1994, as amended at 61 FR 20741, May 8, 1996]

§ 89.116-96 Engine families.

(a) A manufacturer's product line is divided into engine families that are comprised of engines expected to have similar emission characteristics throughout their useful life periods.

(b) The following characteristics distinguish engine families:

(1) Fuel;

(2) Cooling medium;

(3) Method of air aspiration;

(4) Method of exhaust aftertreatment (for example, catalytic converter or particulate trap);

- (5) Combustion chamber design;
- (6) Bore;
- (7) Stroke;
- (8) Number of cylinders, (engines with aftertreatment devices only); and
- (9) Cylinder arrangement (engines with aftertreatment devices only).

(c) Upon a showing by the manufacturer that the useful life period emission characteristics are expected to be similar, engines differing in one or more of the characteristics in paragraph (b) of this section may be grouped in the same engine family.

(d) Upon a showing by the manufacturer that the expected useful life period emission characteristics will be different, engines identical in all the characteristics of paragraph (b) of this section may be divided into separate engine families.

§ 89.117-96 Test fleet selection.

(a) The manufacturer must select for testing, from each engine family, the engine with the most fuel injected per stroke of an injector at maximum power.

(b) Each engine in the test fleet must be constructed to be representative of production engines.

(c) After review of the manufacturer's test fleet, the Administrator may select from the available fleet one additional test engine from each engine family.

§ 89.118-96 Service accumulation.

(a)(1) Each test engine in the test fleet must be operated with all emission control systems operating properly for a period sufficient to stabilize emissions.

(2) A manufacturer may elect to consider as stabilized emission levels from engines with no more than 125 hours of service.

(b) No maintenance, other than recommended lubrication and filter changes, may be performed during service accumulation without the Administrator's approval.

(c) Service accumulation should be performed in a manner using good engineering judgment to ensure that emissions are representative of in-use engines.

(d) The manufacturer must maintain, and provide to the Administrator if re-

quested, records stating the rationale for selecting the service accumulation period and records describing the method used to accumulate service hours on the test engine(s).

§ 89.119-96 Emission tests.

(a) *Manufacturer testing.* (1) Upon completion of service accumulation, the manufacturer must test each test engine using the specified test procedures, except as provided in § 89.114-96. The procedures to be used are set forth in:

- (i) Subpart E of this part;
- (ii) The California Regulations for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines. This procedure has been incorporated by reference. See § 89.6; and
- (iii) Part 86, subpart I of this chapter.

(2) Each test engine must be configured to be representative of actual in-use operation. The Administrator may specify the adjustment of any adjustable parameter. All test results must be reported to the Administrator.

(b) *Confirmatory testing.* The Administrator may conduct confirmatory testing or other testing on any test engine. The manufacturer must deliver test engines as directed by the Administrator. When the Administrator conducts confirmatory testing or other testing, those test results are used to determine compliance with emission standards.

(c) *Use of carryover test data.* In lieu of testing to certify an engine family for a given model year, the manufacturer may submit, with the Administrator's approval, emission test data used to certify that engine family in previous years. This "carryover" data is only allowable if the submitted test data show that the test engine would comply with the emission standard(s) for the model year for which certification is being sought.

(d) *Test fuels.* EPA may use the fuel specified in either Table 4 or Table 5 of appendix A to subpart D of this part in confirmatory testing or other testing on any test engine. Emission test results based on use of Table 5 fuel will be used to confirm compliance with HC, CO, NO_x, PM, and smoke standards. Emission test results based on Table 4 fuel will be used to confirm

compliance with HC, CO, NO_x, and smoke standards; when a manufacturer uses the fuel specified in Table 4 of appendix A to subpart D of this part for its certification testing, EPA has the option to use the PM emission result, corrected using the PM correction factor specified in § 89.425-96, to confirm compliance with the PM standard.

§ 89.120-96 Compliance with emission standards.

(a) If all test engines representing an engine family have emissions less than or equal to each emission standard, that family complies with the emission standards.

(b) If any test engine representing an engine family has emissions greater than each emission standard, that family will be deemed not in compliance with the emission standard(s).

(c) If aftertreatment is employed by an engine family, then a deterioration factor must be determined and applied.

(d) For engine families included in the averaging, banking, and trading program, the families' emission limits (FELs) are used in lieu of the applicable federal emission standard.

§ 89.121-96 Certificate of conformity effective dates.

The certificate of conformity is valid from the date of issuance by EPA until 31 December of the model year or calendar year for which it is issued.

§ 89.122-96 Certification.

(a) If, after a review of the manufacturer's application, request for certificate, information obtained from any inspection, and such other information as the Administrator may require, the Administrator determines that the application is complete and that the engine family meets the requirements of this part and the Clean Air Act, the Administrator shall issue a certificate of conformity.

(b) If, after a review of the information described in paragraph (a) of this section, the Administrator determines that the requirements of this part and the Clean Air Act have not been met, the Administrator will deny certification. The Administrator must give a written explanation when certification

is denied. The manufacturer may request a hearing on a denial.

§ 89.123-96 Amending the application and certificate of conformity.

(a) The manufacturer of nonroad compression-ignition engines must notify the Administrator when changes to information required to be described in the application for certification are to be made to a product line covered by a certificate of conformity. This notification must include a request to amend the application or the existing certificate of conformity. Except as provided in paragraph (e) of this section, the manufacturer shall not make said changes or produce said engines prior to receiving approval from EPA.

(b) A manufacturer's request to amend the application or the existing certificate of conformity shall include the following information:

(1) A full description of the change to be made in production or of the engine to be added;

(2) Engineering evaluations or data showing that engines as modified or added will comply with all applicable emission standards; and

(3) A determination whether the manufacturer's original test fleet selection is still appropriate, and if the original test fleet selection is determined not to be appropriate, proposed test fleet selection(s) representing the engines changed or added which would have been required if the engines had been included in the original application for certification.

(c) The Administrator may require the manufacturer to perform tests on the engine representing the engine to be added or changed.

(d) *Decision by Administrator.* (1) Based on the description of the proposed amendment and data derived from such testing as the Administrator may require or conduct, the Administrator will determine whether the proposed change or addition would still be covered by the certificate of conformity then in effect.

(2) If the Administrator determines that the change or new engine(s) meets the requirements of this subpart and the Act, the appropriate certificate of conformity is amended.

(3) If the Administrator determines that the changed or new engine(s) does not meet the requirements of this subpart and the Act, the certificate of conformity will not be amended. The Administrator shall provide a written explanation to the manufacturer of the decision not to amend the certificate. The manufacturer may request a hearing on a denial.

(e) A manufacturer may make changes in or additions to production engines concurrently with notifying the Administrator as required by paragraph (a) of this section, if the manufacturer complies with the following requirements:

(1) In addition to the information required in paragraph (b) of this section, the manufacturer must supply supporting documentation, test data, and engineering evaluations as appropriate to demonstrate that all affected engines will still meet applicable emission standards.

(2) If, after a review, the Administrator determines additional testing is required, the manufacturer must provide required test data within 30 days or cease production of the affected engines.

(3) If the Administrator determines that the affected engines do not meet applicable requirements, the Administrator will notify the manufacturer to cease production of the affected engines and to recall and correct at no expense to the owner all affected engines previously produced.

(4) Election to produce engines under this paragraph will be deemed to be a consent to recall all engines which the Administrator determines do not meet applicable standards and to cause such nonconformity to be remedied at no expense to the owner.

§ 89.124-96 Record retention, maintenance, and submission.

(a) The manufacturer of any nonroad compression-ignition engine must maintain the following adequately organized records:

(1) Copies of all applications filed with the Administrator.

(2) A detailed history of each test engine used for certification including the following:

(i) A description of the test engine's construction, including a general description of the origin and buildup of the engine, steps taken to ensure that it is representative of production engines, description of components specially built for the test engine, and the origin and description of all emission-related components;

(ii) A description of the method used for service accumulation, including date(s) and the number of hours accumulated;

(iii) A description of all maintenance, including modifications, parts changes, and other servicing performed, and the date(s) and reason(s) for such maintenance;

(iv) A description of all emission tests performed (except tests performed by the EPA directly) including routine and standard test documentation, as specified in subpart E of this part, date(s) and the purpose of each test;

(v) A description of all tests performed to diagnose engine or emission control performance, giving the date and time of each and the reason(s) for the test; and

(vi) A description of any significant event(s) affecting the engine during the period covered by the history of the test engine but not described by an entry under one of the previous paragraphs of this section.

(b) Routine emission test data, such as those reporting test cell temperature and relative humidity at start and finish of test and raw emission results from each mode or test phase, must be retained for a period of one year after issuance of all certificates of conformity to which they relate. All other information specified in paragraph (a) of this section must be retained for a period of eight years after issuance of all certificates of conformity to which they relate.

(c) Records may be kept in any format and on any media, provided that at the Administrator's request, organized, written records in English are promptly supplied by the manufacturer.

(d) The manufacturer must supply, at the Administrator's request, copies of any engine maintenance instructions

or explanations issued by the manufacturer.

§ 89.125-96 Production engines, annual report.

(a) Upon the Administrator's request, the manufacturer must supply a reasonable number of production engines for testing and evaluation. These engines must be representative of typical production and must be supplied for testing at such time and place and for such reasonable periods as the Administrator may require.

(b) The manufacturer must annually, within 30 days after the end of the model year, notify the Administrator of the number of engines produced by engine family, by gross power, by displacement, by fuel system, or by other categories as the Administrator may require.

§ 89.126-96 Denial, revocation of certificate of conformity.

(a) If, after review of the manufacturer's application, request for certification, information obtained from any inspection, and any other information the Administrator may require, the Administrator determines that one or more test engines do not meet applicable standards (or family emission limits, as appropriate), then the Administrator will notify the manufacturer in writing, setting forth the basis for this determination.

(b) Notwithstanding the fact that engines described in the application may comply with all other requirements of this subpart, the Administrator may deny the issuance of, suspend, or revoke a previously issued certificate of conformity if the Administrator finds any one of the following infractions to be substantial:

(1) The manufacturer submits false or incomplete information;

(2) The manufacturer denies an EPA enforcement officer or EPA authorized representative the opportunity to conduct authorized inspections;

(3) The manufacturer fails to supply requested information or amend its application to include all engines being produced;

(4) The manufacturer renders inaccurate any test data which it submits

or otherwise circumvents the intent of the Act or this part;

(5) The manufacturer denies an EPA enforcement officer or EPA authorized representative reasonable assistance (as defined in § 89.129-96(e)).

(c) If a manufacturer knowingly commits an infraction specified in paragraph (b)(1) or (b)(4) of this section, knowingly commits any other fraudulent act which results in the issuance of a certificate of conformity, or fails to comply with the conditions specified in §§ 89.203-96(f), 89.206-96(d), 89.209-96(c) or 89.210-96(g), the Administrator may deem such certificate void ab initio.

(d) When the Administrator denies, suspends, revokes, or voids ab initio a certificate of conformity the manufacturer will be provided a written determination. The manufacturer may request a hearing under § 89.127-96 on the Administrator's decision.

(e) Any suspension or revocation of a certificate of conformity shall extend no further than to forbid the introduction into commerce of engines previously covered by the certification which are still in the hands of the manufacturer, except in cases of such fraud or other misconduct that makes the certification invalid ab initio.

§ 89.127-96 Request for hearing.

(a) A manufacturer may request a hearing on the Administrator's denial, suspension, voiding ab initio or revocation of a certificate of conformity.

(b) The manufacturer's request must be filed within 30 days of the Administrator's decision, be in writing, and set forth the manufacturer's objections to the Administrator's decision and data to support the objections.

(c) If, after review of the request and supporting data, the Administrator finds that the request raises a substantial and factual issue, the Administrator will grant the manufacturer's request for a hearing.

§ 89.128-96 Hearing procedures.

(a)(1) After granting a request for a hearing the Administrator shall designate a Presiding Officer for the hearing.

(2) The hearing will be held as soon as practicable at a time and place determined by the Administrator or by the Presiding Officer.

(3) The Administrator may, at his or her discretion, direct that all argument and presentation of evidence be concluded within a specified period established by the Administrator. Said period may be no less than 30 days from the date that the first written offer of a hearing is made to the manufacturer. To expedite proceedings, the Administrator may direct that the decision of the Presiding Officer (who may, but need not, be the Administrator) shall be the final EPA decision.

(b)(1) Upon appointment pursuant to paragraph (a) of this section, the Presiding Officer will establish a hearing file. The file shall consist of the following:

(i) The determination issued by the Administrator under § 89.126-96(d);

(ii) The request for a hearing and the supporting data submitted therewith;

(iii) All documents relating to the request for certification and all documents submitted therewith; and

(iv) Correspondence and other data material to the hearing.

(2) The hearing file will be available for inspection by the applicant at the office of the Presiding Officer.

(c) An applicant may appear in person or may be represented by counsel or by any other duly authorized representative.

(d)(1) The Presiding Officer, upon the request of any party or at his or her discretion, may arrange for a prehearing conference at a time and place he/she specifies. Such prehearing conference will consider the following:

(i) Simplification of the issues;

(ii) Stipulations, admissions of fact, and the introduction of documents;

(iii) Limitation of the number of expert witnesses;

(iv) Possibility of agreement disposing of any or all of the issues in dispute; and

(v) Such other matters as may aid in the disposition of the hearing, including such additional tests as may be agreed upon by the parties.

(2) The results of the conference shall be reduced to writing by the Presiding Officer and made part of the record.

(e)(1) Hearings shall be conducted by the Presiding Officer in an informal but orderly and expeditious manner. The parties may offer oral or written evidence, subject to the exclusion by the Presiding Officer of irrelevant, immaterial, and repetitious evidence.

(2) Witnesses will not be required to testify under oath. However, the Presiding Officer shall call to the attention of witnesses that their statements may be subject to the provisions of 18 U.S.C. 1001 which imposes penalties for knowingly making false statements or representations or using false documents in any matter within the jurisdiction of any department or agency of the United States.

(3) Any witness may be examined or cross-examined by the Presiding Officer, the parties, or their representatives.

(4) Hearings shall be reported verbatim. Copies of transcripts of proceedings may be purchased by the applicant from the reporter.

(5) All written statements, charts, tabulations, and similar data offered in evidence at the hearings shall, upon a showing satisfactory to the Presiding Officer of their authenticity, relevancy, and materiality, be received in evidence and shall constitute a part of the record.

(6) Oral argument may be permitted at the discretion of the Presiding Officer and shall be reported as part of the record unless otherwise ordered by the Presiding Officer.

(f)(1) The Presiding Officer shall make an initial decision which shall include written findings and conclusions and the reasons or basis regarding all the material issues of fact, law, or discretion presented on the record. The findings, conclusions, and written decision shall be provided to the parties and made a part of the record. The initial decision shall become the decision of the Administrator without further proceedings, unless there is an appeal to the Administrator or motion for review by the Administrator within 20 days of the date the initial decision was filed. If the Administrator has determined under paragraph (a) of this section that the decision of the Presiding Officer is final, there is no right of appeal to the Administrator.

(2) On appeal from or review of the initial decision, the Administrator shall have all the powers which he or she would have in making the initial decision, including the discretion to require or allow briefs, oral argument, the taking of additional evidence, or the remanding to the Presiding Officer for additional proceedings. The decision by the Administrator may adopt the original decision or shall include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the appeal or considered in the review.

§ 89.129-96 Right of entry.

(a) Any manufacturer who has applied for certification of a new engine or engine family subject to certification testing under this subpart shall admit or cause to be admitted to any of the following facilities during operating hours any EPA enforcement officer or EPA authorized representative on presentation of credentials.

(1) Any facility where any such certification testing or any procedures or activities connected with such certification testing are or were performed;

(2) Any facility where any new engine which is being, was, or is to be tested is present;

(3) Any facility where any construction process or assembly process used in the modification or buildup of such an engine into a certification engine is taking place or has taken place; and

(4) Any facility where any record or other document relating to any of the above is located.

(b) Upon admission to any facility referred to in paragraph (a)(1) of this section, any EPA enforcement officer or EPA authorized representative shall be allowed:

(1) To inspect and monitor any part or aspect of such procedures, activities, and testing facilities, including, but not limited to, monitoring engine preconditioning, emission tests and service accumulation, maintenance, and engine storage procedures, and to verify correlation or calibration of test equipment;

(2) To inspect and make copies of any such records, designs, or other documents; and

(3) To inspect and photograph any part or aspect of any such certification engine and any components to be used in the construction thereof.

(c) To allow the Administrator to determine whether production engines conform in all material respects to the design specifications applicable to those engines, as described in the application for certification for which a certificate of conformity has been issued, any manufacturer shall admit any EPA enforcement officer or EPA authorized representative on presentation of credentials to:

(1) Any facility where any document, design, or procedure relating to the translation of the design and construction of engines and emission-related components described in the application for certification or used for certification testing into production engines is located or carried on; and

(2) Any facility where any engines to be introduced into commerce are manufactured or assembled.

(d) On admission to any such facility referred to in paragraph (c) of this section, any EPA enforcement officer or EPA authorized representative shall be allowed:

(1) To inspect and monitor any aspects of such manufacture or assembly and other procedures;

(2) To inspect and make copies of any such records, documents or designs; and

(3) To inspect and photograph any part or aspect of any such new engines and any component used in the assembly thereof that are reasonably related to the purpose of his or her entry.

(e) Any EPA enforcement officer or EPA authorized representative shall be furnished by those in charge of a facility being inspected with such reasonable assistance as he or she may request to help the enforcement officer or authorized representative discharge any function listed in this paragraph. Each applicant for or recipient of certification is required to cause those in charge of a facility operated for its benefit to furnish such reasonable assistance without charge to EPA whether or not the applicant controls the facility.

(1) Reasonable assistance includes, but is not limited to, clerical, copying,

interpretation and translation services; the making available on request of personnel of the facility being inspected during their working hours to inform the EPA enforcement officer or EPA authorized representative of how the facility operates and to answer the officer's questions; and the performance on request of emission tests on any engine which is being, has been, or will be used for certification testing. Such tests shall be nondestructive, but may require appropriate service accumulation.

(2) A manufacturer may be compelled to cause any employee at a facility being inspected to appear before an EPA enforcement officer or EPA authorized representative. The request for the employee's appearance shall be in writing, signed by the Assistant Administrator for Air and Radiation, and served on the manufacturer. Any employee who has been instructed by the manufacturer to appear will be entitled to be accompanied, represented, and advised by counsel.

(f) The duty to admit or cause to be admitted any EPA enforcement officer or EPA authorized representative applies whether or not the applicant owns or controls the facility in question and applies both to domestic and to foreign manufacturers and facilities. EPA will not attempt to make any inspections which it has been informed that local law forbids. However, if local law makes it impossible to do what is necessary to ensure the accuracy of data generated at a facility, no informed judgment that an engine is certifiable or is covered by a certificate can properly be based on those data. It is the responsibility of the manufacturer to locate its testing and manufacturing facilities in jurisdictions where this situation will not arise.

(g) Any entry without 24 hours prior written or oral notification to the affected manufacturer shall be authorized in writing by the Assistant Administrator for Enforcement.

Subpart C—Averaging, Banking, and Trading Provisions

§ 89.201-96 Applicability.

Nonroad compression-ignition engines subject to the provisions of sub-

part A of this part are eligible to participate in the averaging, banking, and trading program described in this subpart.

§ 89.202-96 Definitions.

The definitions in subpart A of this part apply to this subpart. The following definitions also apply to this subpart:

Averaging for nonroad engines means the exchange of emission credits among engine families within a given manufacturer's product line.

Banking means the retention of nonroad engine emission credits by the manufacturer generating the emission credits for use in future model year averaging or trading as permitted by these regulations.

Emission credits represent the amount of emission reduction or exceedance, by a nonroad engine family, below or above the emission standard, respectively. Emission reductions below the standard are considered as "positive credits," while emission exceedances above the standard are considered as "negative credits." In addition, "projected credits" refer to emission credits based on the projected applicable production/sales volume of the engine family. "Reserved credits" are emission credits generated within a model year waiting to be reported to EPA at the end of the model year. "Actual credits" refer to emission credits based on actual applicable production/sales volume as contained in the end-of-year reports submitted to EPA. Some or all of these credits may be revoked if EPA review of the end-of-year reports or any subsequent audit action(s) uncovers problems or errors.

Trading means the exchange of nonroad engine emission credits between manufacturers.

§ 89.203-96 General provisions.

(a) The averaging, banking, and trading program for NO_x emissions from eligible nonroad engines is described in this subpart. Participation in this program is voluntary.

(b) A nonroad engine family is eligible to participate in the averaging, banking, and trading program for NO_x emissions if it is subject to regulation

under subpart B of this part with certain exceptions specified in subsection (c) of this section. No averaging, banking, and trading program is available for meeting the HC, CO, PM, or smoke emission standards specified in subpart B of this part.

(c) Nonroad engines may not participate in the averaging, banking, and trading program if they are subject to state engine emission standards, are exported, or use an alternate or special test procedure under § 89.114-96.

(d) A manufacturer may certify one or more nonroad engine families at family emission limits (FELs) above or below the applicable emission standard, provided the summation of the manufacturer's projected balance of all credit transactions in a given model year is greater than or equal to zero, as determined under § 89.207-96.

(1) FELs for NO_x may not exceed 14.6 grams per kilowatt hour.

(2) An engine family certified to an FEL is subject to all provisions specified in subparts B, D, E, G, H, I, J, and K of this part, except that the applicable FEL replaces the NO_x emission standard for the family participating in the averaging, banking, and trading program.

(3) A manufacturer of an engine family with an FEL exceeding the applicable emission standard must obtain emission credits sufficient to address the associated credit shortfall via averaging, banking, or trading.

(4) An engine family with an FEL below the applicable standard may generate emission credits for averaging, banking, trading, or a combination thereof. Emission credits may not be used to offset an engine family's emissions that exceed its applicable FEL. Credits may not be used to remedy nonconformity determined by a Selective Enforcement Audit (SEA) or by recall (in-use) testing. However, in the case of an SEA failure, credits may be used to allow subsequent production of engines for the family in question if the manufacturer elects to recertify to a higher FEL.

(e) Credits generated in a given model year may be used in the following three model years. Credits not used by the end of the third model year after being generated are forfeited.

Credits generated in one model year may not be used for prior model years.

(f) Manufacturers must demonstrate compliance under the averaging, banking, and trading program for a particular model year by 270 days after the model year. Engine families without an adequate amount of emission credits will violate the conditions of the certificates of conformity. The certificates of conformity may be voided ab initio under § 89.126-96(c) for those engine families.

§ 89.204-96 Averaging.

(a) A manufacturer may use averaging to offset an emission exceedance of a nonroad engine family caused by an FEL above the applicable emission standard. Credits used in averaging may be obtained from credits generated by another engine family in the same model year, credits banked in the three previous model years, or credits obtained through trading.

(b) Credits scheduled to expire in the earliest model year must be used first, before using other available credits.

§ 89.205-96 Banking.

(a) A manufacturer of a nonroad engine family with an FEL below the applicable standard for a given model year may bank credits in that model year for use in averaging and trading in the following three model years. Credits not withdrawn within the three model years after they are banked are forfeited.

(b) A manufacturer of a nonroad engine family may bank credits up to one calendar year prior to the effective date of mandatory certification. Such engines must meet the requirements of subparts A, B, D, E, F, G, H, I, J, and K of this part.

(c) A manufacturer may bank actual credits only after the end of the model year and after EPA has reviewed the manufacturer's end-of-year reports. During the model year and before submittal of the end-of-year report, credits originally designated in the certification process for banking will be considered reserved and may be redesignated for trading or averaging in the end-of-year report and final report.

(d) Credits declared for banking from the previous model year that have not

been reviewed by EPA may be used in averaging or trading transactions. However, such credits may be revoked at a later time following EPA review of the end-of-year report or any subsequent audit actions.

§ 89.206-96 Trading.

(a) A nonroad engine manufacturer may exchange emission credits with other nonroad engine manufacturers in trading.

(b) Credits for trading can be obtained from credits banked in the three previous model years or credits generated during the model year of the trading transaction. Traded credits expire if they are not used in averaging within three model years following the model year in which they were generated.

(c) Traded credits can be used for averaging, banking, or further trading transactions.

(d) In the event of a negative credit balance resulting from a transaction, both the buyer and the seller are liable, except in cases involving fraud. Certificates of all engine families participating in a negative trade may be voided ab initio under § 89.126-96(c).

§ 89.207-96 Credit calculation.

For each participating engine family, emission credits (positive or negative) are to be calculated according to one of the following equations and rounded, in accordance with ASTM E29-90, to the nearest one-tenth of a megagram per hour (Mg/hr). ASTM E29-90 has been incorporated by reference. See § 89.6. Consistent units are to be used throughout the equation.

(a) For determining credit availability from all engine families generating credits:

$$\text{Emission credits} = (\text{Std} - \text{FEL}) \times (\text{Volume}) \times (\text{MinPR}) \times (10^{-6})$$

(b) For determining credit usage for all engine families requiring credits to offset emissions in excess of the standard:

$$\text{Emission credits} = (\text{Std} - \text{FEL}) \times (\text{Volume}) \times (\text{MaxPR}) \times (10^{-6})$$

Where:

Std=the current and applicable nonroad engine emission standard in grams per brake horsepower hour.

FEL=the family emission limit for the engine family in grams per brake horsepower hour.

Volume=the number of nonroad engines eligible to participate in the averaging, banking, and trading program within the given engine family during the model year. Quarterly production projections are used for initial certification. Actual applicable production/sales volumes is used for end-of-year compliance determination.

MinPR=the power rating of the configuration within an engine family with the lowest power rating.

MaxPR=the power rating of the configuration within an engine family with the highest power rating.

§ 89.208-96 Labeling.

For all nonroad engines included in the averaging, banking, and trading program, the family emission limit to which the engine is certified must be included on the label required in § 89.110-96.

§ 89.209-96 Certification.

(a) In the application for certification a manufacturer must:

(1) Declare its intent to include specific engine families in the averaging, banking, and trading program.

(2) Submit a statement that the engines for which certification is requested will not, to the best of the manufacturer's belief, cause the manufacturer to have a negative credit balance when all credits are calculated for all the manufacturer's engine families participating in the averaging, banking, and trading program.

(3) Declare an FEL for each engine family participating in averaging, banking, and trading.

(i) The FEL must be to the same number of significant digits as the emission standard.

(ii) In no case may the FEL exceed the upper limit prescribed in § 89.203-96(d).

(4) Indicate the projected number of credits generated/needed for this family; the projected applicable production/sales volume, by quarter; and the values required to calculate credits as given in § 89.207-96.

(5) Submit calculations in accordance with § 89.207-96 of projected emission credits (positive or negative) based on

quarterly production projections for each participating family.

(6)(i) If the engine family is projected to have negative emission credits, state specifically the source (manufacturer/engine family or reserved) of the credits necessary to offset the credit deficit according to quarterly projected production.

(ii) If the engine family is projected to generate credits, state specifically (manufacturer/engine family or reserved) where the quarterly projected credits will be applied.

(b) All certificates issued are conditional upon manufacturer compliance with the provisions of this subpart both during and after the model year of production.

(c) Failure to comply with all provisions of this subpart will be considered to be a failure to satisfy the conditions upon which the certificate was issued, and the certificate may be deemed void ab initio.

(d) The manufacturer bears the burden of establishing to the satisfaction of the Administrator that the conditions upon which the certificate was issued were satisfied or waived.

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

§ 89.210-96 Maintenance of records.

(a) The manufacturer of any nonroad engine that is certified under the averaging, banking, and trading program must establish, maintain, and retain the following adequately organized and indexed records for each such engine produced:

- (1) EPA engine family;
- (2) Engine identification number;
- (3) Engine model year and build date;
- (4) Power rating;
- (5) Purchaser and destination; and
- (6) Assembly plant.

(b) The manufacturer of any nonroad engine family that is certified under the averaging, banking, and trading program must establish, maintain, and retain the following adequately orga-

nized and indexed records for each such family:

- (1) EPA engine family;
- (2) Family emission limit (FEL);
- (3) Power rating for each configuration tested;
- (4) Projected applicable production/sales volume for the model year; and
- (5) Actual applicable production/sales volume for the model year.

(c) Any manufacturer producing an engine family participating in trading reserved credits must maintain the following records on a quarterly basis for each engine family in the trading program:

- (1) The engine family;
- (2) The actual quarterly and cumulative applicable production/sales volume;
- (3) The value required to calculate credits as given in § 89.207-96;
- (4) The resulting type and number of credits generated/required;
- (5) How and where credit surpluses are dispersed; and
- (6) How and through what means credit deficits are met.

(d) The manufacturer must retain all records required to be maintained under this section for a period of eight years from the due date for the end-of-model-year report. Records may be retained as hard copy or reduced to microfilm, ADP diskettes, and so forth, depending on the manufacturer's record retention procedure; provided, that in every case all information contained in the hard copy is retained.

(e) Nothing in this section limits the Administrator's discretion in requiring the manufacturer to retain additional records or submit information not specifically required by this section.

(f) Pursuant to a request made by the Administrator, the manufacturer must submit to the Administrator the information that the manufacturer is required to retain.

(g) EPA may void ab initio under § 89.126-96(c) a certificate of conformity for an engine family for which the manufacturer fails to retain the records required in this section or to provide such information to the Administrator upon request.

§ 89.211-96 End-of-year and final reports.

(a) End-of-year and final reports must indicate the engine family, the actual applicable production/sales volume, the values required to calculate credits as given in § 89.207-96, and the number of credits generated/required. Manufacturers must also submit how and where credit surpluses were dispersed (or are to be banked) and/or how and through what means credit deficits were met. Copies of contracts related to credit trading must be included or supplied by the broker, if applicable. The report shall include a calculation of credit balances to show that the summation of the manufacturer's use of credits results in a credit balance equal to or greater than zero.

(b) The applicable production/sales volume for end-of-year and final reports must be based on the location of the point of first retail sale (for example, retail customer, dealer, secondary manufacturer) also called the final product purchase location.

(c)(1) End-of-year reports must be submitted within 90 days of the end of the model year to: Director, Manufacturers Operations Division (6405-J), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460.

(2) Final reports must be submitted within 270 days of the end of the model year to: Director, Manufacturers Operations Division (6405-J), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460.

(d) Failure by a manufacturer participating in the averaging, banking, or trading program to submit any end-of-year or final reports in the specified time for all engines is a violation of sections 203(a)(1) and 213 of the Clean Air Act for each engine.

(e) A manufacturer generating credits for deposit only who fails to submit end-of-year reports in the applicable specified time period (90 days after the end of the model year) may not use the credits until such reports are received and reviewed by EPA. Use of projected credits pending EPA review is not permitted in these circumstances.

(f) Errors discovered by EPA or the manufacturer in the end-of-year report, including errors in credit calculation,

may be corrected in the final report up to 270 days from the end of the model year.

(g) If EPA or the manufacturer determines that a reporting error occurred on an end-of-year or final report previously submitted to EPA under this section, the manufacturer's credits and credit calculations will be recalculated. Erroneous positive credits will be void except as provided in paragraph (h) of this section. Erroneous negative credit balances may be adjusted by EPA.

(h) If within 270 days of the end of the model year, EPA review determines a reporting error in the manufacturer's favor (that is, resulting in an increased credit balance) or if the manufacturer discovers such an error within 270 days of the end of the model year, the credits shall be restored for use by the manufacturer.

§ 89.212-96 Notice of opportunity for hearing.

Any voiding of the certificate under §§ 89.203-96(f), 89.206-96(d), 89.209-96(c) and 89.210-96(g) will be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with §§ 89.512 and 89.513 and, if a manufacturer requests such a hearing, will be made only after an initial decision by the Presiding Officer.

Subpart D—Emission Test Equipment Provisions**§ 89.301-96 Scope; applicability.**

(a) This subpart describes the equipment required in order to perform exhaust emission tests on new nonroad compression-ignition engines subject to the provisions of subpart B of part 89.

(b) Exhaust gases, either raw or dilute, are sampled while the test engine is operated using an 8-mode test cycle on an engine dynamometer. The exhaust gases receive specific component analysis determining concentration of pollutant, exhaust volume, the fuel flow, and the power output during each mode. Emission is reported as grams per kilowatt hour (g/kw-hr). See subpart E of this part for a complete description of the test procedure.

(c) General equipment and calibration requirements are given in § 89.304-96 through 89.324-96. Sections 89.325-96 through 89.331-96 set forth general test specifications.

(d) Additional information about system design, calibration methodologies, and so forth, for raw gas sampling can be found in part 86, subpart D of this chapter. Examples for system design, calibration methodologies, and so forth, for dilute exhaust gas sampling can be found in part 86, subpart N of this chapter.

§ 89.302-96 Definitions.

The definitions in subpart A of part 89 apply to this subpart. For terms not defined in part 89, the definitions in part 86, subparts A, D, I, and N apply to this subpart. The following definition also applies to this subpart.

Specific emissions, g/kW-hr, is expressed on the basis of observed gross brake power. When it is not possible to test the engine in the gross conditions, for example, if the engine and transmission form a single integral unit, the engine may be tested in the net condition. Power corrections from net to gross conditions will be allowed with prior approval of the Administrator.

§ 89.303-96 Symbols/abbreviations.

(a) The abbreviations in § 86.094-3 or part 89.3 of this chapter apply to this subpart.

(b) The abbreviations in Table 1 in appendix A of this subpart apply to this subpart. Some abbreviations from § 89.3 have been included for the convenience of the reader.

(c) The symbols in Table 2 in appendix A of this subpart apply to this subpart.

§ 89.304-96 Equipment required for gaseous emissions; overview.

(a) All engines subject to this subpart are tested for exhaust emissions. Engines are operated on dynamometers meeting the specification given in § 89.306-96.

(b) The exhaust is tested for gaseous emissions using a raw gas sampling system as described in § 89.412-96 or a constant volume sampling (CVS) system as described in § 89.419-96. Both systems require analyzers (see para-

graph (c) of this section) specific to the pollutant being measured.

(c) Analyzers used are a non-dispersive infrared (NDIR) absorption type for carbon monoxide and carbon dioxide analysis; paramagnetic (PMD), zirconia (ZRDO), or electrochemical type (ECS) for oxygen analysis; a heated flame ionization (HFID) type for hydrocarbon analysis; and a chemiluminescent detector (CLD) or heated chemiluminescent detector (HCLD) for oxides of nitrogen analysis. Sections 89.309-96 through 89.324-96 set forth a full description of analyzer requirements and specifications.

§ 89.305-96 Equipment measurement accuracy/calibration frequency.

The accuracy of measurements must be such that the maximum tolerances shown in Table 3 in appendix A of this subpart are not exceeded. Calibrate all equipment and analyzers according to the frequencies shown in Table 3 in appendix A of this subpart.

§ 89.306-96 Dynamometer specifications and calibration weights.

(a) *Dynamometer specifications.* The dynamometer test stand and other instruments for measurement of power output must meet the accuracy and calibration frequency requirements shown in Table 3 in appendix A of this subpart. The dynamometer must be capable of performing the test cycle described in § 89.410-96.

(b) *Dynamometer calibration weights.* A minimum of six calibration weights for each range used are required. The weights must be spaced to reflect good engineering judgement such that they cover the range of weights required and must be traceable to within 0.5 percent of NIST weights. Laboratories located in foreign countries may certify calibration weights to local government bureau standards.

§ 89.307-96 Dynamometer calibration.

(a) If necessary, follow the dynamometer manufacturer's instructions for initial start-up and basic operating adjustments.

(b) Check the dynamometer torque measurement for each range used by the following method:

(1) Warm up the dynamometer following the dynamometer manufacturer's specifications.

(2) Determine the dynamometer calibration moment arm (a distance/weight measurement). Dynamometer manufacturer's data, actual measurement, or the value recorded from the previous calibration used for this subpart may be used.

(3) When calibrating the engine flywheel torque transducer, any lever arm used to convert a weight or a force through a distance into a torque must be in a horizontal position (± 5 degrees).

(4) Calculate the indicated torque (IT) for each calibration weight to be used by:

IT = calibration weight (N) \times calibration moment arm (m)

(5) Attach each calibration weight specified in §89.306-96 to the moment arm at the calibration distance determined in paragraph (b)(2) of this section. Record the power measurement equipment response (N-m) to each weight.

(6) For each calibration weight, compare the torque value measured in paragraph (b)(5) of this section to the calculated torque determined in paragraph (b)(4) of this section.

(7) The measured torque must be within 2 percent of the calculated torque.

(8) If the measured torque is not within 2 percent of the calculated torque, adjust or repair the system. Repeat steps in paragraphs (b)(1) through (b)(6) of this section with the adjusted or repaired system.

(c) Optional. A master load-cell or transfer standard may be used to verify the torque measurement system.

(1) The master load-cell and read out system must be calibrated with weights at each test weight specified in §89.306-96. The calibration weights must be traceable to within 0.1 percent of applicable national standards.

(2) Warm up the dynamometer following the equipment manufacturer's specifications.

(3) Attach the master load-cell and loading system.

(4) Load the dynamometer to a minimum of 6 equally spaced torque values as indicated by the master load-cell for each in-use range used.

(5) The in-use torque measurement must be within 2 percent of the torque measured by the master system for each load used.

(6) If the in-use torque is not within 2 percent of the master torque, adjust or repair the system. Repeat steps in paragraphs (c)(2) through (c)(5) of this section with the adjusted or repaired system.

(d) Calibrated resistors may not be used for engine flywheel torque transducer calibration, but may be used to span the transducer prior to engine testing.

(e) Perform other engine dynamometer system calibrations as dictated by good engineering practice.

§89.308-96 Sampling system requirements for gaseous emissions.

(a) For each component (pump, sample line section, filters, and so forth) in the heated portion of the sampling system that has a separate source of power or heating element, use engineering judgment to locate the coolest portion of that component and monitor the temperature at that location. If several components are within an oven, then only the surface temperature of the component with the largest thermal mass and the oven temperature need be measured.

(b) If water is removed by condensation, the sample gas temperature or sample dewpoint must be monitored either within the water trap or downstream. It may not exceed 7 °C.

§89.309-96 Analyzers required for gaseous emissions.

(a) *Analyzers.* The following instruments are required for analyzing the measured gases:

(1) *Carbon Monoxide (CO) analysis.* (i) The carbon monoxide analyzer must be of the non-dispersive infrared (NDIR) absorption type.

(ii) The use of linearizing circuits is permitted.

(2) *Carbon Dioxide (CO₂) analysis.* (i) The carbon dioxide analyzer must be of the non-dispersive infrared (NDIR) absorption type.

(ii) The use of linearizing circuits is permitted.

(3) *Oxygen (O₂) analysis.* Oxygen (O₂) analyzers may be of the paramagnetic

(PMD), zirconia (ZRDO) or electrochemical type (ECS).

(4) *Hydrocarbon (HC) analysis.* (i) The hydrocarbon analyzer must be of the heated flame ionization (HFID) type.

(ii) If the temperature of the exhaust gas at the sample probe is below 190 °C, the temperature of the valves, pipework, and so forth, must be controlled so as to maintain a wall temperature of 190 °C ± 11 °C. If the temperature of the exhaust gas at the sample probe is above 190 °C, the temperature of the valves, pipework, and so forth, must be controlled so as to maintain a wall temperature greater than 180 °C.

(iii) The oven must be capable of maintaining temperature within 2 °C of the set point.

(iv) Fuel and burner air must conform to the specifications in § 89.312-96.

(v) The percent of oxygen interference must be less than 3 percent, as specified in § 89.319-96(d).

(5) *Oxides of nitrogen (NO_x) analysis.* (i) This analysis device must consist of the subsequent items, following the sample probe, in the given order:

(A) Pipework, valves, and so forth, controlled so as to maintain a wall temperature above 60 °C.

(B) A NO₂ to NO converter. The NO₂ to NO converter efficiency must be at least 90 percent.

(C) An ice bath or other cooling device located after the NO_x converter.

(D) A chemiluminescent detector (CLD).

(ii) The quench interference must be less than 3.0 percent as measured in § 89.318-96.

(b) Other gas analyzers yielding equivalent results may be used with advance approval of the Administrator.

(c) The following requirements must be incorporated in each system used for testing under this subpart.

(1) Carbon monoxide and carbon dioxide measurements must be made on a dry basis (for raw exhaust measurement only). Specific requirements for the means of drying the sample can be found in § 89.309-96(e).

(2) Calibration or span gases for the NO_x measurement system must pass through the NO₂ to NO converter.

(d) The electromagnetic compatibility (EMC) of the equipment must be on

a level as to minimize additional errors.

(e) *Gas drying.* Chemical dryers are not an acceptable method of removing water from the sample. Water removal by condensation is acceptable. A water trap performing this function and meeting the specifications in § 89.308-96(b) is an acceptable method. Means other than condensation may be used only with prior approval from the Administrator.

§ 89.310-96 Analyzer accuracy and specifications.

(a) *Measurement accuracy—general.* The analyzers must have a measuring range which allows them to measure the concentrations of the exhaust gas sample pollutants with the accuracies shown in Table 3 in Appendix A of this subpart.

(1) *Response time.* The analyzer response time must be measured and accounted for before recording of data begins.

(2) *Precision.* The precision of the analyzer must be, at worst, ±1 percent of full-scale concentration for each range used at or above 100 ppm (or ppmC) or ±2 percent for each range used below 100 ppm (or ppmC). The precision is defined as 2.5 times the standard deviation(s) of 10 repetitive responses to a given calibration or span gas.

(3) *Noise.* The analyzer peak-to-peak response to zero and calibration or span gases over any 10-second period must not exceed 2 percent of full-scale chart deflection on all ranges used.

(4) *Zero drift.* The analyzer zero-response drift during a 1-hour period must be less than 2 percent of full-scale chart deflection on the lowest range used. The zero-response is defined as the mean response including noise to a zero-gas during a 30-second time interval.

(5) *Span drift.* The analyzer span drift during a 1-hour period must be less than 2 percent of full-scale chart deflection on the lowest range used. The analyzer span is defined as the difference between the span-response and the zero-response. The span-response is defined as the mean response including noise to a span gas during a 30-second time interval.

(b) *Operating procedure for analyzers and sampling system.* Follow the start-up and operating instructions of the instrument manufacturer. Adhere to the minimum requirements given in § 89.314-96 to § 89.323-96.

(c) *Emission measurement accuracy—Bagged sampling.* (1) Good engineering practice dictates that exhaust emission sample analyzer readings below 15 percent of full-scale chart deflection should generally not be used.

(2) Some high resolution read-out systems, such as computers, data loggers, and so forth, can provide sufficient accuracy and resolution below 15 percent of full scale. Such systems may be used provided that additional calibrations are made to ensure the accuracy of the calibration curves. If a gas divider is used, the gas divider must conform to the accuracy requirements specified in § 89.312-96(c). The following procedure for calibration below 15 percent of full scale may be used:

(i) Span the full analyzer range using a top range calibration gas meeting the accuracy requirements of § 89.312-96(c).

(ii) Generate a calibration curve according to, and meeting the requirements of, §§ 89.319-96 through 89.323-96.

(iii) Select a calibration gas (a span gas may be used for calibrating the CO₂ analyzer) with a concentration midway between the two lowest calibration gases or non-zero gas divider increments. This gas must be “named” to an accuracy of ± 2.0 percent of NIST gas standards, or other standards approved by the Administrator.

(iv) Using the calibration curve fitted to the points generated in paragraphs (c)(2)(i) and (ii) of this section, check the concentration of the gas selected in paragraph (c)(2)(iii) of this section. The concentration derived from the curve must be within ± 2.3 percent (± 2.8 percent for CO₂ span gas) of the original named gas concentration.

(v) Provided the requirements of paragraph (c)(2)(iv) of this section are met, use the gas divider with the gas selected in paragraph (c)(2)(iii) of this section and determine the remainder of the calibration points. Fit a calibration curve per §§ 89.319-96 through 89.322-96 of this chapter for the entire analyzer range.

(d) *Emission measurement accuracy—continuous sampling.* Analyzers used for continuous analysis must be operated such that the measured concentration falls between 15 and 100 percent of full-scale chart deflection. Exceptions to these limits are:

(1) The analyzer’s response may be less than 15 percent or more than 100 percent of full scale if automatic range change circuitry is used and the limits for range changes are between 15 and 100 percent of full-scale chart deflection;

(2) The analyzer’s response may be less than 15 percent of full scale if:

(i) Alternative (c)(2) of this section is used to ensure that the accuracy of the calibration curve is maintained below 15 percent; or

(ii) The full-scale value of the range is 155 ppm (or ppmC) or less.

§ 89.311-96 Analyzer calibration frequency.

(a) Prior to initial use and after major repairs, bench check each analyzer (see § 89.315-96).

(b) Calibrations are performed as specified in §§ 89.319-96 through 89.324-96.

(c) At least monthly, or after any maintenance which could alter calibration, the following calibrations and checks are performed.

(1) Leak check the vacuum side of the system (see § 89.316-96).

(2) Check that the analysis system response time has been measured and accounted for.

(3) Verify that the automatic data collection system (if used) meets the requirements found in Table 3 in appendix A of this subpart.

(4) Check the fuel flow measurement instrument to insure that the specifications in Table 3 in appendix A of this subpart are met.

(d) Verify that all NDIR analyzers meet the water rejection ratio and the CO₂ rejection ratio as specified in § 89.318-96.

(e) Verify that the dynamometer test stand and power output instrumentation meet the specifications in Table 3 in appendix A of this subpart.

§ 89.312-96 Analytical gases.

(a) The shelf life of all calibration gases must not be exceeded. The expiration date of the calibration gases stated by the gas manufacturer shall be recorded.

(b) *Pure gases.* The required purity of the gases is defined by the contamination limits given below. The following gases must be available for operation:

(1) Purified nitrogen (Contamination ≤ 1 ppm C, ≤ 1 ppm CO, ≤ 400 ppm CO₂, ≤ 0.1 ppm NO)

(2) Purified oxygen (Purity 99.5 percent vol O₂)

(3) Hydrogen-helium mixture (40 \pm 2 percent hydrogen, balance helium) (Contamination ≤ 31 ppm C, ≤ 400 ppm CO)

(4) Purified synthetic air (Contamination ≤ 1 ppm C, ≤ 1 ppm CO, ≤ 400 ppm CO₂, ≤ 0.1 ppm NO) (Oxygen content between 18-21 percent vol.)

(c) *Calibration and span gases.* (1) Calibration gas values are to be derived from NIST Standard Reference Materials (SRM's) or other standardized gas samples and are to be single blends as listed in the following paragraph.

(2) Mixtures of gases having the following chemical compositions shall be available:

C₃ H₈ and purified synthetic air (dilute measurements);

C₃ H₈ and purified nitrogen (raw measurements);

CO and purified nitrogen;

NO_x and purified nitrogen (the amount of NO₂ contained in this calibration gas must not exceed 5 percent of the NO content);

CO₂ and purified nitrogen

(3) The true concentration of a span gas must be within ± 2 percent of the NIST gas standard. The true concentration of a calibration gas must be within ± 1 percent of the NIST gas standard. The use of precision blending devices (gas dividers) to obtain the required calibration gas concentrations is acceptable, provided that the blended gases are accurate to within ± 1.5 percent of NIST gas standards, or other gas standards which have been approved by the Administrator. This accuracy implies that primary gases used (or blending) must be "named" to an accuracy of at least ± 1 percent, trace-

able to NIST or other approved gas standards. All concentrations of calibration gas shall be given on a volume basis (volume percent or volume ppm).

(4) The gas concentrations used for calibration and span may also be obtained by means of a gas divider, either diluting with purified N₂ or diluting with purified synthetic air. The accuracy of the mixing device must be such that the concentration of the diluted gases may be determined to within ± 2 percent.

(d) Oxygen interference check gases shall contain propane with 350 ppmC ± 75 ppmC hydrocarbon. The concentration value shall be determined to calibration gas tolerances by chromatographic analysis of total hydrocarbons plus impurities or by dynamic blending. Nitrogen shall be the predominant diluent with the balance oxygen.

(e) Fuel for the FID shall be a blend of 40 percent ± 2 percent hydrogen with the balance being helium. The mixture shall contain less than 1 ppm equivalent carbon response; 98 to 100 percent hydrogen fuel may be used with advance approval of the Administrator.

(f) *Hydrocarbon analyzer burner air.* The concentration of oxygen must be within 1 mole percent of the oxygen concentration of the burner air used in the latest oxygen interference check (%O₂ I). If the difference in oxygen concentration is greater than 1 mole percent, then the oxygen interference must be checked and, if necessary, the analyzer adjusted to meet the %O₂ I requirements. The burner air must contain less than 2 ppmC hydrocarbon.

§ 89.313-96 Initial calibration of analyzers.

(a) *Warming-up time.* The warming-up time should be according to the recommendations of the manufacturer. If not specified, a minimum of two hours shall be allowed for warming up the analyzers.

(b) *NDIR and HFID analyzer.* The NDIR analyzer shall be tuned and maintained according to the instrument manufacturer's instructions. The combustion flame of the HFID analyzer shall be optimized in order to meet the specifications in § 89.319-96(b)(2).

(c) *Zero setting and calibration.* (1) Using purified synthetic air (or nitrogen), the CO, CO₂, NO_x, and HC analyzers shall be set at zero.

(2) Introduce the appropriate calibration gases to the analyzers and the values recorded. The same gas flow rates shall be used as when sampling exhaust.

(d) *Rechecking of zero setting.* The zero setting shall be rechecked and the procedure described in paragraph (c) of this section repeated, if necessary.

§ 89.314-96 Pre- and post-test calibration of analyzers.

Each operating range used during the test shall be checked prior to and after each test in accordance with the following procedure. (A chronic need for parameter adjustment can indicate a need for instrument maintenance.):

(a) The calibration is checked by using a zero gas and a span gas whose nominal value is between 80 percent and 100 percent of full-scale, inclusive, of the measuring range.

(b) After the emission test a zero gas and the same span gas will be used for rechecking. The analysis will be considered acceptable if the difference between the two measuring results is less than 2 percent of full scale.

§ 89.315-96 Analyzer bench checks.

(a) Prior to initial use and after major repairs verify that each analyzer complies with the specifications given in Table 3 in appendix A of this subpart.

(b) If a stainless steel NO₂ to NO converter is used, condition all new or replacement converters. The conditioning consists of either purging the converter with air for a minimum of 4 hours or until the converter efficiency is greater than 90 percent. The converter must be at operational temperature while purging. Do not use this procedure prior to checking converter efficiency on in-use converters.

§ 89.316-96 Analyzer leakage and response time.

(a) *Vacuum side leak check.* (1) Any location within the analysis system where a vacuum leak could affect the test results must be checked.

(2) The maximum allowable leakage rate on the vacuum side is 0.5 percent of the in-use flow rate for the portion of the system being checked. The analyzer flows and bypass flows may be used to estimate the in-use flow rates.

(3) The sample probe and the connection between the sample probe and valve V2 (see Figure 1 in appendix B of this subpart) may be excluded from the leak check.

(b) *Pressure side leak check.* The maximum allowable leakage rate on the pressure side is 5 percent of the in-use flow rate.

(c) The response time shall be accounted for in all emission measurement and calculations.

§ 89.317-96 NO_x converter check.

(a) Prior to its introduction into service, and monthly thereafter, the chemiluminescent oxides of nitrogen analyzer shall be checked for NO₂ to NO converter efficiency. Figure 2 in appendix B of this subpart is a reference for the following paragraphs.

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

(c) Zero the oxides of nitrogen analyzer with zero-grade air or zero-grade nitrogen.

(d) 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.

(e) 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.

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

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

(h) Switch the NO_x generator to the generation mode and adjust the generation rate so that the NO measured on the analyzer is 20 percent of that measured in paragraph (b)(5) of this section. There must be at least 10 percent unreacted NO at this point. Record the concentration of residual NO.

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

(j) 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.

(k) Turn off the NO_x generator O₂ (or air) 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 (b)(4) of this section.

(l) Calculate the efficiency of the NO_x converter by substituting the concentrations obtained into the following equation:

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

Where:

a=concentration obtained in paragraph

(i),

b=concentration obtained in paragraph

(j),

c=concentration obtained in paragraph

(g),

d=concentration obtained in paragraph

(h).

If converter efficiency is not greater than 90 percent, corrective action will be required.

§ 89.318-96 Analyzer interference checks.

(a) Gases present in the exhaust other than the one being analyzed can interfere with the reading in several ways. Positive interference occurs in NDIR and PMD instruments when the interfering gas gives the same effect as the gas being measured, but to a lesser degree. Negative interference occurs in NDIR instruments by the interfering gas broadening the absorption band of

the measured gas and in CLD instruments by the interfering gas quenching the radiation. The interference checks described in this section are to be made initially and after any major repairs that could affect analyzer performance.

(b) *CO analyzer water and CO₂ interference checks.* Prior to its introduction into service and annually thereafter, the NDIR carbon monoxide analyzer shall be checked for response to water vapor and CO₂≤

(1) Follow good engineering practices for instrument start-up and operation. Adjust the analyzer to optimize performance on the most sensitive range to be used.

(2) Zero the carbon monoxide analyzer with either zero-grade air or zero-grade nitrogen.

(3) Bubble a mixture of 3 percent CO₂ in N₂ through water at room temperature and record analyzer response.

(4) An analyzer response of more than 1 percent of full scale for ranges above 300 ppm full scale or more than 3 ppm on ranges below 300 ppm full scale requires corrective action. (Use of conditioning columns is one form of corrective action which may be taken.)

(c) *NO_x analyzer quench check.* The two gases of concern for CLD (and HCLD) analyzers are CO₂ and water vapor. Quench responses to these two gases are proportional to their concentrations and, therefore, require test techniques to determine quench at the highest expected concentrations experienced during testing.

(1) *NO_x analyzer CO₂ quench check.* A CO₂ span gas having a concentration of 80 percent to 100 percent of full scale of the maximum operating range used during testing shall be passed through the CO₂ NDIR analyzer and the value recorded as *a*. It is diluted approximately 50 percent with NO span gas and then passed through the CO₂ NDIR and CLD (or HCLD), with the CO₂ and NO values recorded as *b* and *c* respectively. The CO₂ shall then be shut off and only the NO span gas passed through the CLD (or HCLD) and the NO value recorded as *d*. Percent CO₂ quench shall be calculated as follows and shall not exceed 3 percent:

$$\% \text{ CO}_2 \text{ quench} = 100 \times \left(1 - \frac{(c \times a)}{(d \times a) - (d \times b)} \right) \times (a / b)$$

Where:

a=Undiluted CO₂ concentration (percent)

b=Diluted CO₂ concentration (percent)

c=Diluted NO concentration (ppm)

d=Undiluted NO concentration (ppm)

(2) *NO_x analyzer water quench check.*

(i) This check applies to wet measurements only. An NO span gas having a concentration of 80 percent to 100 percent of full scale of a normal operating range shall be passed through the CLD (or HCLD) and the response recorded as *D*. The NO span gas shall then be bubbled through water at room temperature and passed through the CLD (or HCLD) and the analyzer response recorded as *AR*. Determine and record the analyzer absolute operating pressure and the bubbler water temperature. (It is important that the NO span gas contains minimal NO₂ concentration for this check. No allowance for absorption of NO₂ in water has been made in the following quench calculations.)

(ii) Calculations for water quench must consider dilution of the NO span gas with water vapor and scaling of the water vapor concentration of the mixture to that expected during testing. Determine the mixture's saturated vapor pressure (designated as *Pwb*) that corresponds to the bubbler water temperature. Calculate the water concentration (*Z1*, percent) in the mixture by the following equation:

$$Z1 = 100 \times \frac{Pwb}{GP}$$

where GP = analyzer operating pressure (Pa)

(iii) Calculate the expected dilute NO span gas and water vapor mixture concentration (designated as *D1*) by the following equation:

$$D1 = D \times \left(1 - \frac{Z1}{100} \right)$$

(iv) For diesel (compression-ignition) exhaust, the maximum raw or dilute exhaust water vapor concentration expected during testing (designated as *Wm*) can be estimated from the CO₂ span gas (designated as *A*) criteria in paragraph (c)(1) of this section and the assumption of a fuel atom H/C ratio of 1.8:1 as:

$$Wm(\%) = 0.9 \times A(\%)$$

Where:

A = undiluted CO₂ concentration.

Percent water quench shall not exceed 3 percent and shall be calculated by:

$$\% \text{ Water Quench} = 100 \times \frac{D1 - AR}{D1} \times \frac{Wm}{Z1}$$

§ 89.319-96 Hydrocarbon analyzer calibration.

(a) The FID hydrocarbon analyzer shall receive the initial and periodic calibration as described in this section. The HFID used with petroleum-fueled diesel (compression-ignition) engines shall be operated to a set point ±5.5 °C between 185 and 197 °C.

(b) *Initial and periodic optimization of detector response.* Prior to introduction into service and at least annually thereafter, adjust the FID hydrocarbon analyzer for optimum hydrocarbon response as specified in this paragraph. Alternate methods yielding equivalent results may be used, if approved in advance by the Administrator.

(1) Follow good engineering practices for initial instrument start-up and basic operating adjustment using the appropriate fuel (see § 89.312-96(e)) and zero-grade air.

(2) One of the following procedures is required for FID or HFID optimization:

(i) The procedure outlined in Society of Automotive Engineers (SAE) paper No. 770141, "Optimization of a Flame Ionization Detector for Determination of Hydrocarbon in Diluted Automotive Exhausts"; author, Glenn D. Reschke.

This procedure has been incorporated by reference. See §89.6.

(ii) The HFID optimization procedures outlined in §86.331-79 of this chapter.

(iii) Alternative procedures may be used if approved in advance by the Administrator.

(3) After the optimum flow rates have been determined, record them for future reference.

(c) *Initial and periodic calibration.* Prior to introduction into service and monthly thereafter, the FID or HFID hydrocarbon analyzer shall be calibrated on all normally used instrument ranges using the steps in this paragraph. Use the same flow rate and pressures as when analyzing samples. Calibration gases shall be introduced directly at the analyzer, unless the "overflow" calibration option of §86.1310-90(b)(3)(i) of this chapter for the HFID is taken.

(1) Adjust analyzer to optimize performance.

(2) Zero the hydrocarbon analyzer with zero-grade air.

(3) Calibrate on each used operating range with propane-in-air (dilute) or propane-in-nitrogen (raw) calibration gases having nominal concentrations starting between 10-15 percent and increasing in at least six incremental steps to 90 percent of that range. The incremental steps are to be spaced to represent good engineering practice. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(d) *Oxygen interference optimization.* Choose a range where the oxygen interference check gases will fall in the upper 50 percent. Conduct the test, as outlined in this paragraph, with the oven temperature set as required by the instrument manufacturer. Oxygen interference check gas specifications are found in §89.312-96(d).

(1) Zero the analyzer.

(2) Span the analyzer with the purified synthetic air specified in §89.312-96(b)(4).

(3) Recheck zero response. If it has changed more than 0.5 percent of full scale repeat paragraphs (d)(1) and (d)(2) of this section to correct problem.

(4) Introduce the 5 percent and 10 percent oxygen interference check gases.

(5) Recheck the zero response. If it has changed more ± 1 percent of full scale, repeat the test.

(6) Calculate the percent of oxygen interference (designated as *percent O₂I*) for each mixture in paragraph (d)(4) of this section.

$$\text{percent O}_2\text{I} = \frac{(B - C)}{B}(100)$$

A=hydrocarbon concentration (ppmC) of the span gas used in paragraph (d)(2) of this section.

B=hydrocarbon concentration (ppmC) of the oxygen interference check gases used in paragraph (d)(4) of this section.

$$C = \text{analyzer response (ppmC)} = \frac{A}{D}$$

D=percent of full-scale analyzer response due to *A*.

(7) The percent of oxygen interference (designated as *%O₂I*) must be less than ± 3.0 percent for all required oxygen interference check gases prior to testing.

(8) If the oxygen interference is greater than the specifications, incrementally adjust the air flow above and below the manufacturer's specifications, repeating paragraphs (d)(1) through (d)(7) of this section for each flow.

(9) If the oxygen interference is greater than the specification after adjusting the air flow, vary the fuel flow and thereafter the sample flow, repeating paragraphs (d)(1) through (d)(7) of this section for each new setting.

(10) If the oxygen interference is still greater than the specifications, repair or replace the analyzer, FID fuel, or burner air prior to testing. Repeat this section with the repaired or replaced equipment or gases.

§ 89.320-96 Carbon monoxide analyzer calibration.

(a) Calibrate the NDIR carbon monoxide as described in this section.

(b) *Initial and periodic interference check.* Prior to its introduction into service and annually thereafter, the NDIR carbon monoxide analyzer shall be checked for response to water vapor and CO₂ in accordance with § 318.96(b).

(c) *Initial and periodic calibration.* Prior to its introduction into service and monthly thereafter, the NDIR carbon monoxide analyzer shall be calibrated.

(1) Adjust the analyzer to optimize performance.

(2) Zero the carbon monoxide analyzer with either zero-grade air or zero-grade nitrogen.

(3) Calibrate on each used operating range with carbon monoxide-in-N₂ calibration gases having nominal concentrations starting between 10 and 15 percent and increasing in at least six incremental steps to 90 percent of that range. The incremental steps are to be spaced to represent good engineering practice. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(d) The initial and periodic interference, system check, and calibration test procedures specified in part 86, subpart D of this chapter may be used in lieu of the procedures specified in this section.

§ 89.321-96 Oxides of nitrogen analyzer calibration.

(a) The chemiluminescent oxides of nitrogen analyzer shall receive the initial and periodic calibration described in this section.

(b) Prior to its introduction into service, and monthly thereafter, the chemiluminescent oxides of nitrogen analyzer is checked for NO₂ to NO converter efficiency according to § 89.317-96.

(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 air or zero-grade nitrogen.

(3) Calibrate on each normally used operating range with NO-in-N₂ calibration gases with nominal concentrations starting at between 10 and 15 percent and increasing in at least six incremental steps to 90 percent of that range. The incremental steps are to be spaced to represent good engineering practice. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(d) The initial and periodic interference, system check, and calibration test procedures specified in part 86, subpart D of this chapter may be used in lieu of the procedures specified in this section.

§ 89.322-96 Carbon dioxide analyzer calibration.

(a) Prior to its introduction into service, and monthly thereafter, the NDIR carbon dioxide analyzer shall be calibrated as follows:

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

(2) Zero the carbon dioxide analyzer with either zero-grade air or zero-grade nitrogen.

(3) Calibrate on each normally used operating range with carbon dioxide-in-N₂ calibration or span gases having nominal concentrations starting between 10 and 15 percent and increasing in at least six incremental steps to 90 percent of that range. The incremental

steps are to be spaced to represent good engineering practice. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(b) The initial and periodic interference, system check, and calibration test procedures specified in part 86, subpart D of this chapter may be used in lieu of the procedures in this section.

§ 89.323-96 NDIR analyzer calibration.

(a) *Detector optimization.* If necessary, follow the instrument manufacturer's instructions for initial start-up and basic operating adjustments.

(b) *Calibration curve.* Develop a calibration curve for each range used as follows:

(1) Zero the analyzer.

(2) Span the analyzer to give a response of approximately 90 percent of full-scale chart deflection.

(3) Recheck the zero response. If it has changed more than 0.5 percent of full scale, repeat the steps given in paragraphs (b)(1) and (b)(2) of this section.

(4) Record the response of calibration gases having nominal concentrations starting between 10 and 15 percent and increasing in at least six incremental steps to 90 percent of that range. The incremental steps are to be spaced to represent good engineering practice.

(5) Generate a calibration curve. The calibration curve shall be of fourth order or less, have five or fewer coefficients. If any range is within 2 percent of being linear a linear calibration may be used. Include zero as a data point. Compensation for known impurities in the zero gas can be made to the zero-data point. The calibration curve must fit the data points within 2 percent of point.

(6) Optional. A new calibration curve need not be generated if:

(i) A calibration curve conforming to paragraph (b)(5) of this section exists; or

(ii) The responses generated in paragraph (b)(4) of this section are within 1 percent of full scale or 2 percent of point, whichever is less, of the responses predicted by the calibration curve for the gases used in paragraph (b)(4) of this section.

(7) If multiple range analyzers are used, the lowest range used must meet the curve fit requirements below 15 percent of full scale.

§ 89.324-96 Calibration of other equipment.

Other test equipment used for testing shall be calibrated as often as required by the instrument manufacturer or as necessary according to good practice.

§ 89.325-96 Engine intake air temperature measurement.

(a) Engine intake air temperature measurement must be made within 122 cm of the engine. The measurement location must be made either in the supply system or in the air stream entering the supply system.

(b) The temperature measurements shall be accurate to within ± 2 °C.

§ 89.326-96 Engine intake air humidity measurement.

(a) *Humidity conditioned air supply.* Air that has had its absolute humidity altered is considered humidity-conditioned air. For this type of intake air supply, the humidity measurements must be made within the intake air supply system and after the humidity conditioning has taken place.

(b) *Nonconditioned air supply procedure.* Humidity measurements in non-conditioned intake air supply systems must be made in the intake air stream entering the supply system. Alternatively, the humidity measurements can be measured within the intake air supply stream.

§ 89.327-96 Charge cooling.

For engines with an air-to-air intercooler (or any other low temperature charge air cooling device) between the turbocharger compressor and the intake manifold, follow SAE J1937. This

procedure has been incorporated by reference. See § 89.6. The temperature of the cooling medium and the temperature of the charge air shall be monitored and recorded.

§ 89.328-96 Inlet and exhaust restrictions.

(a) The manufacturer is liable for emission compliance over the full range of restrictions that are specified by the manufacturer for that particular engine.

(b) Perform testing at the following inlet and exhaust restriction settings.

(1) Equip the test engine with an air inlet system presenting an air inlet restriction at the upper limit at maximum air flow, as specified by the engine manufacturer for a clean air cleaner. A system representative of the installed engine may be used. In other cases a test shop system may be used.

(2) The exhaust backpressure must be at the upper limit at maximum declared power, as specified by the engine manufacturer. A system representative of the installed engine may be used. In other cases a test shop system may be used.

§ 89.329-96 Engine cooling system.

An engine cooling system is required with sufficient capacity to maintain the engine at normal operating temperatures as prescribed by the engine manufacturer.

§ 89.330-96 Lubricating oil and test fuels.

(a) *Lubricating oil.* Use the engine lubricating oil for testing that meets the requirements as specified by the manufacturer for a particular engine and intended usage. Record the specifications of the lubricating oil used for the test.

(b) *Test fuels.* (1) Use diesel fuels for testing which are clean and bright, with pour and cloud points adequate for operability. The diesel fuel may contain nonmetallic additives as follows: Cetane improver, metal deactivator, antioxidant, dehazer, antirust, pour depressant, dye, dispersant, and biocide.

(2) Use only petroleum fuel meeting the specifications in Table 4 in appendix A of this subpart, or substantially equivalent specifications approved by

the Administrator, for exhaust emission testing. Alternatively, petroleum fuel meeting the specifications in Table 5 in appendix A of this subpart may be used in exhaust emission testing. The grade of diesel fuel used must be commercially designated as "Type 2-D" grade diesel fuel and recommended by the engine manufacturer. If the fuel specified in Table 4 in Appendix A of this subpart is used, the adjustment factor specified in § 89.425-96 may be applied to particulate emission values to account for the impact of sulfur in fuel on particulate emissions.

(c) Other fuels may be used for testing provided they meet the following qualifications:

(1) They are commercially available;

(2) Information acceptable to the Administrator is provided to show that only the designated fuel would be used in customer service;

(3) Use of a fuel listed under paragraph (b) of this section would have a detrimental effect on emissions or durability; and

(4) Fuel specifications are approved in writing by the Administrator prior to the start of testing.

(d) Report the specification range of the fuel to be used under paragraphs (b)(2) and (c)(1) through (c)(4) of this section in the application for certification in accordance with § 89.115-96 (a)(8).

§ 89.331-96 Test conditions.

(a) *General requirements.* Calculate all volumes and volumetric flow rates at standard conditions for temperature and pressure (0 °C and 101.3 kPa), and these conditions must be used consistently throughout all calculations.

(b) *Engine test conditions.* Measure the absolute temperature (designated as T and expressed in Kelvin) of the engine air at the inlet to the engine, and the dry atmospheric pressure (designated as p and expressed in kPa), and determine the parameter f according to the following provisions:

(1) Naturally aspirated and mechanically supercharged engines:

$$f = \frac{99}{p_s} \times \left(\frac{T}{298} \right)^{0.7}$$

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(2) Turbocharged engine with or without cooling of inlet air:

$$f = \left(\frac{99}{p_s} \right)^{0.7} \times \left(\frac{T}{298} \right)^{1.5}$$

(c) For a test to be recognized as valid, the parameter *f* shall be between the limits as shown below:

$$0.98 < f < 1.02$$

APPENDIX A TO SUBPART D—TABLES

TABLE 1.—ABBREVIATIONS USED IN SUBPART D

| | |
|-----------------------|---|
| CLD | Chemiluminescent detector. |
| CO | Carbon monoxide. |
| CO ₂ | Carbon dioxide. |
| HC | Hydrocarbons. |
| HCLD | Heated chemiluminescent detector. |
| HFID | Heated flame ionization detector. |
| NDIR | Non-dispersive infra-red analyzer. |
| NIST | National Institute for Standards and Testing. |
| NO | Nitric Oxide. |
| NO ₂ | Nitrogen Dioxide. |
| NOx | Oxides of nitrogen. |
| O ₂ | Oxygen. |
| PMD | Paramagnetic detector. |
| ZROD | Zirconiumdioxide sensor. |

TABLE 2.—SYMBOLS USED IN SUBPART D

| Symbol | Term | Unit |
|--------------------------|--|-------------------|
| Conc | Concentration (ppm by volume) | ppm |
| <i>f</i> | Engine specific parameter considering atmospheric conditions | |
| F _{FCB} | Fuel specific factor for the carbon balance calculation | |
| F _{FD} | Fuel specific factor for exhaust flow calculation on dry basis | |
| F _{FH} | Fuel specific factor representing the hydrogen to carbon ratio | |
| F _{FW} | Fuel specific factor for exhaust flow calculation on wet basis | |
| G _{AIRW} | Intake air mass flow rate on wet basis | kg/h |
| G _{AIRD} | Intake air mass flow rate on dry basis | kg/h |
| G _{EXHW} | Exhaust gas mass flow rate on wet basis | kg/h |
| G _{Fuel} | Fuel mass flow rate | kg/h |
| H | Absolute humidity (water content related to dry air) | g/kg |
| <i>i</i> | Subscript denoting an individual mode | |
| K _H | Humidity correction factor | |
| L | Percent torque related to maximum torque for the test mode | % |
| Mass | Pollutant mass flow | g/h |
| n _{di} | Engine speed (average at the <i>i</i> 'th mode during the cycle) | 1/min |
| P _s | Dry atmospheric pressure | kPa |
| P _a | Test ambient saturation vapor pressure at ambient temperature | kPa |
| P | Gross power output uncorrected | kW |
| P _{AUX} | Declared total power absorbed by auxiliaries fitted for the test | kW |
| P _M | Maximum power measured at the test speed under test conditions | kW |
| P _i | P _i =P _{M,i} +P _{AUX,i} | |
| P _B | Total barometric pressure (average of the pre-test and post-test values) | kPa |
| R _a | Relative humidity of the ambient air | % |
| S | Dynamometer setting | kW |
| T | Absolute temperature at air inlet | K |
| T _{be} | Air temperature after the charge air cooler (if applicable) (average) | K |
| T _{clout} | Coolant temperature outlet (average) | K |
| T _{dp} | Absolute dewpoint temperature | K |
| T _{di} | Torque (average at the <i>i</i> 'th mode during the cycle) | N-m |
| T _{sc} | Temperature of the intercooled air | K |
| T _{ref} | Reference temperature | K |
| V _{EXHD} | Exhaust gas volume flow rate on dry basis | m ³ /h |
| V _{AIRW} | Intake air volume flow rate on wet basis | m ³ /h |
| P _B | Total barometric pressure | kPa |
| V _{EXHW} | Exhaust gas volume flow rate on wet basis | m ³ /h |
| WF | Weighing factor. | |
| WF _E | Effective weighing factor. | |

TABLE 3.—MEASUREMENT ACCURACY CALIBRATION FREQUENCY (MY96 AND LATER)

| No. | Item | Permissible deviation from reading ¹ | | Calibration frequency |
|-----|------------------------|---|-----------|-----------------------|
| | | Nonidle | Idle | |
| 1 | Engine speed | ±2% | ±2% | 30 days. |
| 2 | Torque | ±2% | ±5% | 30 days. |
| 3 | Fuel consumption | ±1% | ±5% | 30 days. |
| 4 | Air consumption | ±2% | ±5% | As required. |

TABLE 3.—MEASUREMENT ACCURACY CALIBRATION FREQUENCY (MY96 AND LATER)—Continued

| No. | Item | Permissible deviation from reading ¹ | | Calibration frequency |
|-----|--|---|------------|-----------------------|
| | | Nonidle | Idle | |
| 5 | Coolant temperature | ±2 °K | Same | As required. |
| 6 | Lubricant temperature | ±2 °K | Same | As required. |
| 7 | Exhaust backpressure | ±5% | Same | As required. |
| 8 | Inlet depression | ±5% | Same | As required. |
| 9 | Exhaust gas temperature | ±15 °K | Same | As required. |
| 10 | Air inlet temperature (combustion air) | ±2 °K | Same | As required. |
| 11 | Atmospheric pressure | ±0.5% | Same | As required. |
| 12 | Humidity (combustion air) (relative) | ±3.0% | Same | As required. |
| 13 | Fuel temperature | ±2 °K | Same | As required. |
| 14 | Temperature with regard to dilution tunnel | ±2 °K | Same | As required. |
| 15 | Dilution air humidity | ±3% absolute | Same | As required. |
| 16 | HC analyzer | ±2% ² | Same | 30 days. |
| 17 | CO analyzer | ±2% ² | Same | 30 days. |
| 18 | NO _x analyzer | ±2% ² | Same | 30 days. |
| 19 | NO _x converter efficiency check | 90% | Same | 30 days. |
| 20 | CO ₂ analyzer | ±2% ² | Same | 30 days. |

¹ All accuracy requirements pertain to the final recorded value which is inclusive of the data acquisition system.
² If reading is under 100 ppm then the accuracy shall be ±2 ppm.

TABLE 4. TEST FUEL SPECIFICATIONS FOR MY96 AND LATER:FEDERAL SPECIFICATIONS

| Item | Procedure (ASTM) ¹ | Value (type 2-D) |
|--------------------------------------|-------------------------------|------------------|
| Cetane | D613-86 | 42-50 |
| Distillation range: | | |
| IBP, °C | D86-90 | 171-204 |
| 10% point, °C | D86-90 | 204-235 |
| 50% point, °C | D86-90 | 243-283 |
| 90% point, °C | D86-90 | 293-332 |
| EP, °C | D86-90 | 321-366 |
| Gravity, API | D287-92 | 33-37 |
| Total sulfur, %mass | D129-91 or D2622-92 | >0.05-0.5 |
| Hydrocarbon composition: | | |
| Aromatics, %vol. | D1319-89 | 210 |
| Parafins, | D1319-89 | (³) |
| Napthenes, | | |
| Olefins, | | |
| Flashpoint, °C (minimum) | D93-90 | 54 |
| Viscosity @ 38 °C, Centistokes | D445-88 | 2.0-3.2 |

¹ All ASTM procedures in this table have been incorporated by reference. See § 89.6.
² Minimum.
³ Remainder.

TABLE 5.—TEST FUEL SPECIFICATIONS FOR MY96 AND LATER: CALIFORNIA SPECIFICATIONS

| Item | Procedure (ASTM) ¹ | Value (type 2-D) |
|--------------------------------------|-------------------------------|------------------|
| Cetane | D613-86 | 40-48 |
| Distillation range: | | |
| IBP, °C | D86-90 | 171-204 |
| 10% point, °C | D86-90 | 204-235 |
| 50% point, °C | D86-90 | 243-283 |
| 90% point, °C | D86-90 | 293-332 |
| EP, °C | D86-90 | 321-366 |
| Gravity, API | D287-92 | 33-37 |
| Total sulfur, %mass | D129-91 or D2622-92 | .03-.05 |
| Hydrocarbon composition: | | |
| Aromatics %vol. | D1319-89 | 10 ² |
| Parafins | D1319-89 | (³) |
| Napthenes | | |
| Olefins | | |
| Flashpoint, °C (minimum) | D93-90 | 54 |
| Viscosity @ 38 °C, centistokes | D445-88 | 2.0-3.2 |

¹ All ASTM procedures in this table have been incorporated by reference. See § 89.6.
² Minimum.
³ Remainder.

APPENDIX B TO SUBPART D—FIGURES

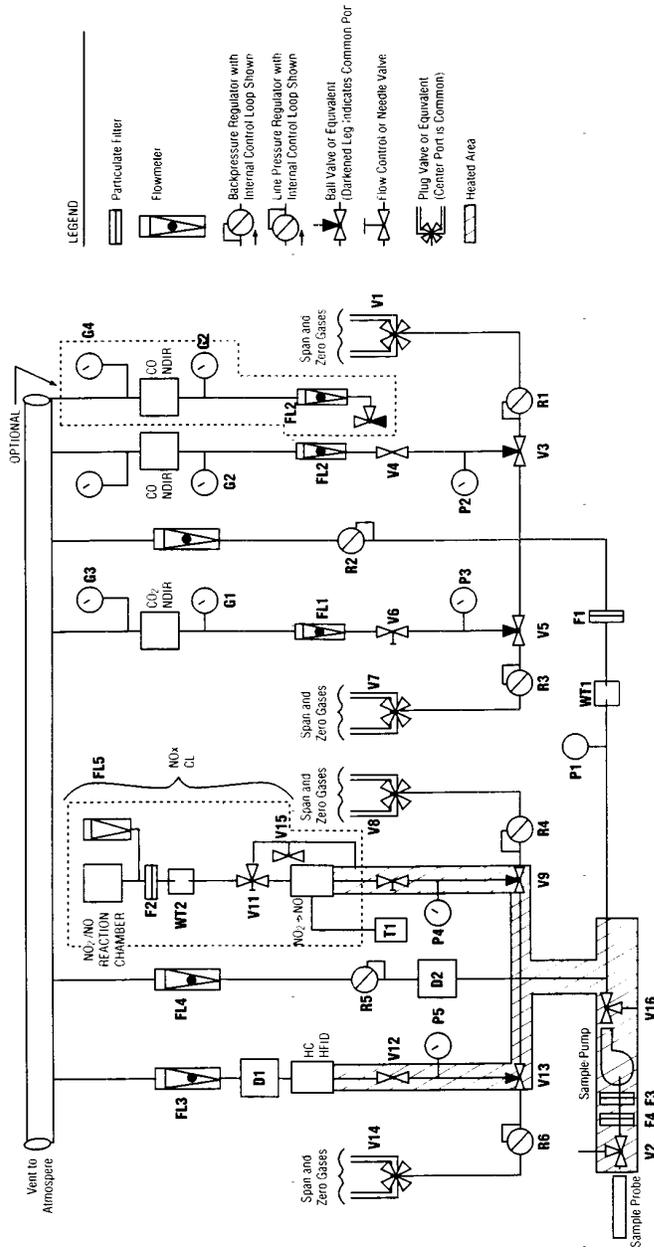


Figure 1. — Exhaust Gas Sampling and Analytical Train

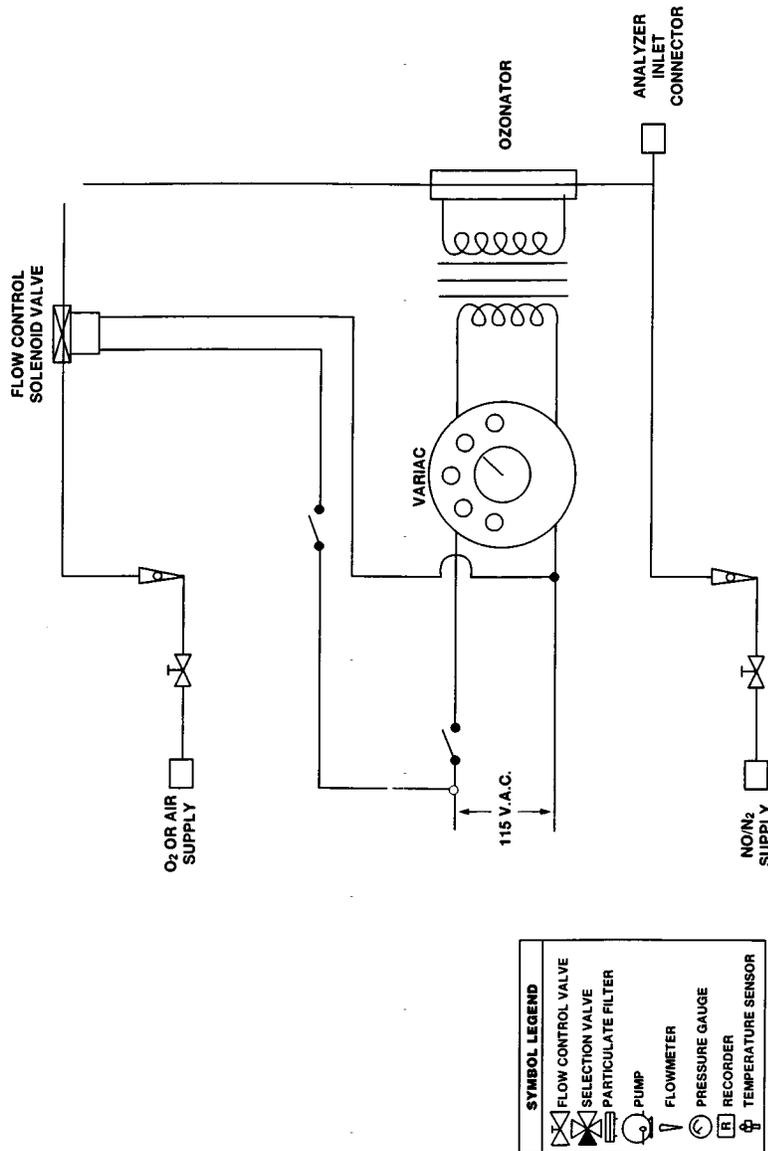


Figure 2. — NO_x Converter Efficiency Detector

Subpart E—Exhaust Emission Test Procedures

§ 89.401-96 Scope; applicability.

(a) This subpart describes the procedures to follow in order to perform exhaust emission tests on new nonroad

compression-ignition engines subject to the provisions of subpart B of this part.

(b) Exhaust gases, either raw or dilute, are sampled while the test engine is operated using an 8-mode test cycle

on an engine dynamometer. The exhaust gases receive specific component analysis determining concentration of pollutant, exhaust volume, the fuel flow, and the power output during each mode. Emission is reported as grams per kilowatt hour (g/kW-hr).

(c) Requirements for emission test equipment and calibrating this equipment are found in subpart D of this part.

§ 89.402-96 Definitions.

The definitions in subpart A of this part apply to this subpart. For terms not defined in this part, the definitions in part 86, subparts A, D, I, and N of this chapter apply to this subpart. The following definition also applies to this subpart.

Specific emissions, (g/kW-hr), shall be expressed on the basis of observed gross power.

When it is not possible to test the engine in the gross conditions, for example, if the engine and transmission form a single integral unit, the engine may be tested in the net condition. Power corrections from net to gross conditions will be allowed with prior approval of the Administrator.

§ 89.403-96 Symbols/abbreviations.

(a) The abbreviations in § 86.094-3 or § 89.3 of this chapter apply to this subpart.

(b) The abbreviations in Table 1 in appendix A to subpart D also apply to this subpart. Some abbreviations from § 89.3 have been included for the convenience of the reader.

(c) The symbols in Table 2 in appendix A to subpart D apply to this subpart.

§ 89.404-96 Test procedure overview.

(a) The test consists of prescribed sequences of engine operating conditions to be conducted on an engine dynamometer. The exhaust gases, generated raw or dilute during engine operation, are sampled for specific component analysis through the analytical train. The test is applicable to engines equipped with catalytic or direct-flame afterburners, induction system modifications, or other systems, or to uncontrolled engines.

(b) The test is designed to determine the brake-specific emissions of hydrocarbons, carbon monoxide, and oxides of nitrogen. The test consists of one idle mode, four power modes at one speed and three power modes at another speed. These procedures require the determination of the concentration of each pollutant, exhaust volume, the fuel flow, and the power output during each mode. The measured values are weighted and used to calculate the grams of each pollutant emitted per kilowatt hour (g/kW-hr).

(c)(1) When an engine is tested for exhaust emissions, the complete engine shall be tested with all emission control devices installed and functioning.

(2) On air-cooled engines, the fan shall be installed.

(3) Additional accessories (for example, oil cooler, alternators, or air compressors) may be installed but such accessory loading will be considered parasitic in nature and observed power shall be used in the emission calculation.

(d) All emission control systems installed on or incorporated in the application must be functioning during all procedures in this subpart. In cases of component malfunction or failure, maintenance to correct component failure or malfunction must be authorized in accordance with § 86.094-25 of this chapter.

(e) The engine must be equipped with an electrical generation device typical of one used in customer service (such as an alternator). The power drain from it must be no greater than what is sufficient to operate the engine on the test stand.

§ 89.405-96 Recorded information.

(a) The information described in this section must be recorded, where applicable, for each test.

(b) *Engine description and specification.* A copy of the information specified in this paragraph must accompany each engine sent to the Administrator for compliance testing. The manufacturer need not record the information specified in this paragraph for each test if the information, with the exception of paragraphs (b)(3) and (b)(9) of this section, is included in the manufacturer's application for certification.

- (1) Engine-system combination.
 - (2) Engine identification numbers.
 - (3) Number of hours of operation accumulated on engine.
 - (4) Rated maximum horsepower and torque.
 - (5) Maximum horsepower and torque speeds.
 - (6) Engine displacement.
 - (7) Governed speed.
 - (8) Idle rpm.
 - (9) Fuel consumption at maximum power and torque.
 - (10) Maximum air flow.
 - (11) Air inlet restriction.
 - (12) Exhaust pipe diameter(s).
 - (13) Maximum exhaust system backpressure.
- (c) *Test data; general.*
- (1) Engine-system combination.
 - (2) Engine identification number.
 - (3) Instrument operator.
 - (4) Engine operator.
 - (5) Number of hours of operation accumulated on the engine prior to beginning the warm-up portion of the test.
 - (6) Fuel identification.
 - (7) Date of most recent analytical assembly calibration.
 - (8) All pertinent instrument information such as tuning, gain, serial numbers, detector number, and calibration curve numbers. As long as this information is available for inspection by the Administrator, it may be summarized by system number or analyzer identification numbers.
- (d) *Test data; pre-test.*
- (1) Date and time of day.
 - (2) Test number.
 - (3) Barometric pressure, pre-test segment.
 - (4) Engine intake humidity, pre-test segment for compression-ignition engines with non-conditioned air supply systems.
 - (5) Maximum observed torque for intermediate and rated speeds.
 - (6) Recorder chart or equivalent. Identify for each test segment zero traces for each range used, and span traces for each range used.
 - (7) Air temperature after and pressure drop across the charge air cooler (if applicable) at maximum observed torque and rated speed.
- (e) *Test data; modal.*
- (1) Recorder chart or equivalent. Identify for each test mode the emis-

sion concentration traces and the associated analyzer range(s). The start and finish of each test.

- (2) Observed engine torque.
 - (3) Observed engine rpm.
 - (4) Record engine torque and engine rpm continuously with a chart recorder or equivalent recording device.
 - (5) Intake air flow and depression for each mode.
 - (6) Engine intake air temperature for each mode.
 - (7) Mass fuel flow for each mode.
 - (8) Engine intake humidity.
 - (9) Coolant temperature outlet.
 - (10) Engine fuel inlet temperature, location to be representative of in-use as specified by each manufacturer.
- (f) *Test data; post-test.*

(1) Recorder chart or equivalent. Identify the zero traces for each range used and the span traces for each range used. Identify hangup check, if performed.

- (2) Total number of hours of operation accumulated on the engine.
- (3) Barometric pressure, post-test segment.
- (4) Engine intake humidity, post-test segment for compression-ignition engines with non-conditioned air supply systems.

§ 89.406-96 Pre-test procedures.

- (a) Allow a minimum of 30 minutes warmup in the standby or operating mode prior to spanning the analyzers.
- (b) Replace or clean the filter elements and then vacuum leak check the system per § 89.316-96(a). A pressure leak check is also permitted per § 89.316-96(b). Allow the heated sample line, filters, and pumps to reach operating temperature.
- (c) Perform the following system checks:
 - (1) Check the sample-line temperature (see § 86.310-79 of this chapter for raw test procedures or § 86.1310-90 of this chapter for dilute test procedures).
 - (2) Check that the system response time has been accounted for prior to sample collection data recording.
 - (3) A hang-up check is permitted, but is optional.
 - (4) Check analyzer zero and span at a minimum before and after each test. Further, check analyzer zero and span any time a range change is made or at

the maximum demonstrated time span for stability for each analyzer used.

(e) Check system flow rates and pressures.

§ 89.407-96 Engine dynamometer test run.

(a) Measure and record the temperature of the air supplied to the engine, the fuel temperature at the pump inlet, and the observed barometric pressure.

(b) The governor and fuel system shall have been adjusted to provide engine performance at the levels reported in the application for certification required under § 89.115-96.

(c) The following steps are taken for each test:

(1) Install instrumentation and sample probes as required.

(2) Perform the pre-test procedure as specified in § 89.406-96.

(3) Read and record the general test data as specified in § 89.405-96(c).

(4) Start cooling system.

(5) Precondition (warm up) the engine in the following manner:

(i) Operate the engine at idle for 2 to 3 minutes;

(ii) Operate the engine at approximately 50 percent power at the peak torque speed for 5 to 7 minutes;

(iii) Operate the engine at rated speed and maximum horsepower for 25 to 30 minutes;

(iv) Optional. It is permitted to precondition the engine at rated speed and maximum horsepower until the oil and water temperatures are stabilized. The temperatures are defined as stabilized if they are maintained within ± 2 °C for 2 minutes. The engine must be operated a minimum of 10 minutes for this option. This optional procedure may be substituted for the procedure in paragraph (c)(5)(iii) of this section;

(v) Optional. If the engine has been operating on service accumulation for a minimum of 40 minutes, the service accumulation may be substituted for the procedure in paragraphs (c)(5)(i) through (iii) of this section.

(6) Read and record all pre-test data specified in § 89.405-96(d).

(7) Start the test cycle (see § 89.410-96) within 20 minutes of the end of the warmup. (See paragraph (c)(13) of this section.)

(8) During the first mode calculate the torque corresponding to 75, 50, and 10 percent of the maximum observed torque for the rated speed.

(9) During the fifth mode calculate the torque corresponding to 75 and 50 percent of the maximum observed torque for the intermediate speed.

(10) Record all modal data specified in § 89.405-96(e) during a minimum of the last 60 seconds of each mode.

(11) Record the analyzer(s) response to the exhaust gas during the a minimum of the last 60 seconds of each mode.

(12) Test modes may be repeated, as long as the engine is preconditioned by running the previous mode.

(13) If a delay of more than 20 minutes occurs between the end of one mode and the beginning of another mode, the test is void. If the delay is under four hours, the test may be restarted without preconditioning (begin at the point in the procedure described at paragraph (c)(6) of this section). If the delay exceeds 4 hours, the test shall include preconditioning (begin at paragraph (c)(2) of this section).

(14) The engine speed and torque must be measured within the accuracy requirements of Table 3 (in appendix A to subpart D), and maintained within the requirements of Table 1 (in appendix B to this subpart) during a minimum of the last 60 seconds of each mode.

(15) If at any time during a test mode, the test equipment malfunctions or the specifications in paragraph (c)(14) of this section are not met, the test mode is void and may be aborted. The test mode may be restarted without preconditioning (begin with paragraph (c)(6) of this section).

(16) Fuel flow and air flow during the idle load condition may be determined just prior to or immediately following the dynamometer sequence, if longer times are required for accurate measurements.

(d) *Exhaust gas measurements.* (1) Measure HC, CO, CO₂, and NO_x concentration in the exhaust sample.

(2) Each analyzer range that may be used during a test mode must have the zero and span responses recorded prior to the execution of that test mode. Only the zero and span for the range(s)

used to measure the emissions during a test mode are required to be recorded after the completion of the test mode.

(3) It is permissible to change filter elements between test modes.

(4) A leak check is permitted between test segments.

(5) A hangup check is permitted between test segments.

(6) If, during the emission measurement portion of a test segment, the value of the gauges downstream of the NDIR analyzer(s) *G3* or *G4* (see Figure 1 in appendix B to subpart D) differs by more than ± 0.5 kPa from the pretest value, the test segment is void.

§ 89.408-96 Post-test procedures.

(a) A hangup check is recommended at the completion of the last test mode using the following procedure:

(1) Within 30 seconds introduce a zero-grade gas or room air into the sample probe or valve *V2* (see Figure 1 in appendix B to subpart D) to check the "hangup zero" response. Simultaneously start a time measurement.

(2) Select the lowest HC range used during the test.

(3) Within four minutes of beginning the time measurement in paragraph (a)(1) of this section, the difference between the span-zero response and the hangup zero response shall not be greater than 5.0 percent of full scale or 10 ppmC whichever is greater.

(b) Begin the analyzer span checks within 6 minutes after the completion of the last mode in the test. Record for each analyzer the zero and span response for each range used during the preceding test or test segment.

(c) If during the test, the filter element(s) were replaced or cleaned, a vacuum check must be performed per § 89.316-96(a) immediately after the span checks. If the vacuum side leak check does not meet the requirements of § 89.316-96(a), the test is void.

(d) Record the post-test data specified in § 89.405-96(f).

(e) For a valid test, the analyzer drift between the before-mode and after-mode span checks for each analyzer must meet the following requirements:

(1) The span drift (defined as the change in the difference between the zero response and the span response)

must not exceed 2 percent of full-scale chart deflection for each range used.

(2) The zero response drift must not exceed 2 percent of full-scale chart deflection for each range used above 155 ppm (or ppmC) or 3 percent of full-scale chart deflection for each range below 155 ppm (or ppmC).

§ 89.409-96 Data logging.

(a) A computer or any other automatic data processing device(s) may be used as long as the system meets the requirements of this subpart.

(b) Determine from the data collection records the analyzer responses corresponding to the end of each mode.

(c) Record data at a minimum of once every 5 seconds.

(d) Determine the final value for CO₂, CO, HC, and NO_x concentrations by averaging the concentration of each point taken during the sample period for each mode.

(e) For purposes of this section, calibration data includes calibration curves, linearity curves, span-gas responses, and zero-gas responses.

§ 89.410-96 Engine test cycle.

(a) The 8-mode cycle (see Table 1 in appendix B to this subpart) shall be followed in dynamometer operation tests of compression-ignition nonroad engines.

(b) During each non-idle mode, hold the specified speed and load to within ± 2 percent of point. During each idle mode, speed must be held within the manufacturer's specifications for the engine, and the throttle must be in the fully closed position and torque must not exceed 5 percent of the peak torque value of mode 5.

(c) If the operating conditions specified in paragraph (b) of this section for modes 2, 3, 4, 6, and 7 cannot be maintained, the Administrator may authorize deviations from the specified load conditions. Such deviations shall not exceed 10 percent of the maximum torque at the test speed. The minimum deviations, above and below the specified load, necessary for stable operation shall be determined by the manufacturer and approved by the Administrator prior to the test run.

(d) Power generated during the idle mode may not be included in the calculation of emission results.

§ 89.411-96 Exhaust sample procedure—gaseous components.

(a) *Automatic data collection equipment requirements.* The analyzer response may be read by automatic data collection (ADC) equipment such as computers, data loggers, and so forth. If ADC equipment is used, the following is required:

(1) For bag sample analysis, the analyzer response must be stable at greater than 99 percent of the final reading for the dilute exhaust sample bag. A single value representing the average chart deflection over a 10-second stabilized period shall be stored.

(2) For continuous analysis systems, a single value representing the average integrated concentration over a cycle shall be stored.

(3) The chart deflections or average integrated concentrations required in paragraphs (a)(1) and (a)(2) of this section may be stored on long-term computer storage devices such as computer tapes, storage discs, punch cards, and so forth, or they may be printed in a listing for storage. In either case a chart recorder is not required and records from a chart recorder, if they exist, need not be stored.

(4) If ADC equipment is used to interpret analyzer values, the ADC equipment is subject to the calibration specifications of the analyzer as if the ADC equipment is part of analyzer system.

(b) Data records from any one or a combination of analyzers may be stored as chart recorder records.

(c) *Bag sample analysis.* For bag sample analysis perform the following sequence:

(1) Warm up and stabilize the analyzers; clean and/or replace filter elements, conditioning columns (if used), and so forth, as necessary.

(2) Obtain a stable zero reading.

(3) Zero and span the analyzers with zero and span gases. The span gases must have concentrations between 75 and 100 percent of full-scale chart deflection. The flow rates and system pressures during spanning shall be approximately the same as those encountered during sampling. A sample bag

may be used to identify the required analyzer range.

(4) Recheck zero response. If this zero response differs from the zero response recorded in paragraph (c)(3) of this section by more than 1 percent of full scale, then paragraphs (c)(2), (c)(3), and (c)(4) of this section must be repeated.

(5) If a chart recorder is used, identify and record the most recent zero and span response as the pre-analysis values.

(6) If ADC equipment is used, electronically record the most recent zero and span response as the pre-analysis values.

(7) Measure HC, CO, CO₂, and NO_x background concentrations in the sample bag(s) with approximately the same flow rates and pressures used in paragraph (c)(3) of this section. (Constituents measured continuously do not require bag analysis.)

(8) A post-analysis zero and span check of each range must be performed and the values recorded. The number of events that may occur between the pre- and post-analysis checks is not specified. However, the difference between pre-analysis zero and span values (recorded in paragraph (c)(5) or (c)(6) of this section) versus those recorded for the post-analysis check may not exceed the zero drift limit or the span drift limit of 2 percent of full-scale chart deflection for any range used. Otherwise the test is void.

(d) *Continuous sample analysis.* For continuous sample analysis perform the following sequence:

(1) Warm up and stabilize the analyzers; clean and/or replace filter elements, conditioning columns (if used), and so forth, as necessary.

(2) Leak check portions of the sampling system that operate at negative gauge pressures when sampling, and allow heated sample lines, filters, pumps, and so forth to stabilize at operating temperature.

(3) Optional: Perform a hangup check for the HFID sampling system:

(i) Zero the analyzer using zero air introduced at the analyzer port.

(ii) Flow zero air through the overflow sampling system. Check the analyzer response.

(iii) If the overflow zero response exceeds the analyzer zero response by 2

percent or more of the HFID full-scale deflection, hangup is indicated and corrective action must be taken.

(iv) The complete system hangup check specified in paragraph (e) of this section is recommended as a periodic check.

(4) Obtain a stable zero reading.

(5) Zero and span each range to be used on each analyzer operated prior to the beginning of the test cycle. The span gases shall have a concentration between 75 and 100 percent of full-scale chart deflection. The flow rates and system pressures shall be approximately the same as those encountered during sampling. The HFID analyzer shall be zeroed and spanned through the overflow sampling system.

(6) Re-check zero response. If this zero response differs from the zero response recorded in paragraph (d)(5) of this section by more than 1 percent of full scale, then paragraphs (d)(4), (d)(5), and (d)(6) of this section must be repeated.

(7) If a chart recorder is used, identify and record the most recent zero and span response as the pre-analysis values.

(8) If ADC equipment is used, electronically record the most recent zero and span response as the pre-analysis values.

(9) Collect background HC, CO, CO₂, and NO_x in a sample bag (for dilute exhaust sampling only, see § 89.420-96).

(10) Perform a post-analysis zero and span check for each range used at the conditions specified in paragraph (d)(5) of this section. Record these responses as the post-analysis values.

(11) Neither the zero drift nor the span drift between the pre-analysis and post-analysis checks on any range used may exceed 3 percent for HC, or 2 percent for NO_x, CO, and CO₂, of full scale chart deflection, or the test is void. (If the HC drift is greater than 3 percent of full-scale chart deflection, hydrocarbon hangup is likely.)

(12) Determine background levels of NO_x, CO, or CO₂ (for dilute exhaust sampling only) by the bag sample technique outlined in paragraph (c) of this section.

(e) *Hydrocarbon hangup.* If HC hangup is indicated, the following sequence may be performed:

(1) Fill a clean sample bag with background air.

(2) Zero and span the HFID at the analyzer ports.

(3) Analyze the background air sample bag through the analyzer ports.

(4) Analyze the background air through the entire sample probe system.

(5) If the difference between the readings obtained is 2 ppm or more, clean the sample probe and the sample line.

(6) Reassemble the sample system, heat to specified temperature, and repeat the procedure in paragraphs (e)(1) through (e)(6) of this section.

§ 89.412-96 Raw gaseous exhaust sampling and analytical system description.

(a) *Schematic drawing.* An example of a sampling and analytical system which may be used for testing under this subpart is shown in Figure 1 in appendix B to subpart D. All components or parts of components that are wetted by the sample or corrosive calibration gases shall be either chemically cleaned stainless steel or inert material, for example, polytetrafluoroethylene resin. The use of "gauge savers" or "protectors" with nonreactive diaphragms to reduce dead volumes is permitted.

(b) *Sample probe.* (1) The sample probe shall be a straight, closed-end, stainless steel, multi-hole probe. The inside diameter shall not be greater than the inside diameter of the sample line plus 0.03 cm. The wall thickness of the probe shall not be greater than 0.10 cm. The fitting that attaches the probe to the exhaust pipe shall be as small as practical in order to minimize heat loss from the probe.

(2) The probe shall have a minimum of three holes. The spacing of the radial planes for each hole in the probe must be such that they cover approximately equal cross-sectional areas of the exhaust duct. See Figure 1 in appendix A to this subpart. The angular spacing of the holes must be approximately equal. The angular spacing of any two holes in one plane may not be 180° ± 20° (that is, section view C-C of Figure 1 in appendix A to this subpart). The holes should be sized such that each has approximately the same flow.

If only three holes are used, they may not all be in the same radial plane.

(3) The probe shall extend radially across the exhaust duct. The probe must pass through the approximate center and must extend across at least 80 percent of the diameter of the duct.

(c) *Sample transfer line.* (1) The maximum inside diameter of the sample line shall not exceed 1.32 cm.

(2) If valve *V2* is used, the sample probe must connect directly to valve *V2*. The location of optional valve *V2* may not be greater than 1.22 m from the exhaust duct.

(3) The location of optional valve *V16* may not be greater than 61 cm from the sample pump. The leakage rate for this section on the pressure side of the sample pump may not exceed the leakage rate specification for the vacuum side of the pump.

(d) *Venting.* All vents, including analyzer vents, bypass flow, and pressure relief vents of regulators, should be vented in such a manner to avoid endangering personnel in the immediate area.

(e) Any variation from the specifications in this subpart including performance specifications and emission detection methods may be used only with prior approval by the Administrator.

(f) Additional components, such as instruments, valves, solenoids, pumps, switches, and so forth, may be employed to provide additional information and coordinate the functions of the component systems.

(g) The following requirements must be incorporated in each system used for raw testing under this subpart.

(1) The sample for all components shall be taken with one sample probe, except as allowed under § 89.413-96, and internally split to the different analyzers.

(2) The sample transport system from the engine exhaust pipe to the HC analyzer and the NO_x analyzer must be heated as indicated in Figure 1 in appendix B of subpart D.

§ 89.413-96 Raw sampling procedures.

Follow these procedures when sampling for gaseous emissions.

(a) The gaseous emission sampling probe must be installed at least 0.5 m

or 3 times the diameter of the exhaust pipe—whichever is the larger—upstream of the exit of the exhaust gas system.

(b) In the case of a multi-cylinder engine with a branched exhaust manifold, the inlet of the probe shall be located sufficiently far downstream so as to ensure that the sample is representative of the average exhaust emissions from all cylinders.

(c) In multi-cylinder engines having distinct groups of manifolds, such as in a "Vee" engine configuration, it is permissible to:

(1) Sample after all exhaust pipes have been connected together into a single exhaust pipe.

(2) For each mode, sample from each exhaust pipe and average the gaseous concentrations to determine a value for each mode.

(3) Sample from all exhaust pipes simultaneously with the sample lines connected to a common manifold prior to the analyzer. It must be demonstrated that the flow rate through each individual sample line is ± 4 percent of the average flow rate through all the sample lines.

(4) Use another method, if it has been approved in advance by the Administrator.

(d) All heated sampling lines shall be fitted with a heated filter to extract solid particles from the flow of gas required for analysis. The sample line for CO, CO₂, and O₂ analysis may be heated or unheated.

(e) If the composition of the exhaust gas is influenced by any treatment such as heat exchanger or air injection (except catalysts and soot filters) then the exhaust probe must be taken upstream of this device.

§ 89.414-96 Air flow measurement specifications.

(a) The air flow measurement method used must have a range large enough to accurately measure the air flow over the engine operating range during the test. Overall measurement accuracy must be ± 2 percent of the reading for all modes except the idle mode. For the idle mode, the measurement accuracy

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shall be ±5 percent or less of the reading. The Administrator must be advised of the method used prior to testing.

(b) When an engine system incorporates devices that affect the air flow measurement (such as air bleeds) that result in understated exhaust emission results, corrections to the exhaust emission results shall be made to account for such effects.

§ 89.415-96 Fuel flow measurement specifications.

The fuel flow rate measurement instrument must have a minimum accuracy of ±1 percent of full-scale flow rate for each measurement range used. An exception is allowed at the idle point. For this mode (idle), the minimum accuracy is ±2 percent of full-scale flow rate for the measurement range used. The controlling parameters are the elapsed time measurement of the event and the weight or volume measurement.

§ 89.416-96 Raw exhaust gas flow.

The exhaust gas flow shall be determined by one of the methods described in this section and conform to the tolerances of Table 3 in appendix A to subpart D:

(a) Measurement of the air flow and the fuel flow by suitable metering systems (for details see SAE J244. This procedure has been incorporated by reference. See § 89.6.) and calculation of the exhaust gas flow as follows:

$$K_w = \left[1 - F_{FH} \times \frac{G_{fuel}}{G_{air}} \right] - K_{w1} \text{ only applicable for raw exhaust}$$

F_{FH} = 1.783 if air/fuel ratio is 1.00
 1.865 if air/fuel ratio is 1.35
 1.920 if air/fuel ratio is 3.50

(d) As the NO_x emission depends on ambient air conditions, the NO_x concentration shall be corrected for ambient air temperature and humidity with the factor K_H given in the following formulas. Equation (1) of this paragraph is to be used when testing in uncontrolled dynamometer rooms or at

$$G_{EXHW} = G_{AIRW} + G_{FUEL} \quad (\text{for wet exhaust mass})$$

or

$$V_{EXHD} = V_{AIRD} + (-.767) \times G_{FUEL} \quad (\text{for dry exhaust volume})$$

or

$$V_{EXHW} = V_{AIRW} + .749 \times G_{FUEL} \quad (\text{for wet exhaust volume})$$

(b) Exhaust mass calculation from fuel consumption (see § 89.415-96) and exhaust gas concentrations using the method found in § 89.418-96.

§ 89.417-96 Data evaluation for gaseous emissions.

For the evaluation of the gaseous emission recording, the last 60 seconds of each mode are recorded, and the average values for HC, CO, CO₂, and NO_x during each mode are determined from the average concentration readings determined from the corresponding calibration data.

§ 89.418-96 Raw emission sampling calculations.

(a) The final test results shall be derived through the steps described in this section.

(b) The exhaust gas flow rate G_{EXHW} and V_{EXHW} shall be determined (see § 89.416-96) for each mode.

(c) When applying G_{EXHW} the measured concentration shall be converted to a wet basis according to the following formula, if not already measured on a wet basis.

other sites with uncontrolled temperatures and humidities. Equation (2) of this paragraph is to be used for all testing when performed in controlled condition rooms. For engines operating on alternative combustion cycles, other correction formulas may be used if they can be justified or validated.

(1) For compression-ignition engines operating in uncontrolled conditions:

$$K_H = \frac{1}{1 + A(H - 10.71) + B(T - 298)}$$

Where:

$$A = 0.309 (f/a) - 0.0266$$

$$B = -0.209 (f/a) + 0.00954$$

T=temperature of the air in K

H=humidity of the inlet air in grams of water per kilogram of dry air in which:

$$H = \frac{6.220 \times R_a \times p_d}{(p_B - p_d) \times R_a \times 10^{-2}}$$

(2) For compression-ignition engines operating in controlled conditions:

$$K_H = \frac{1}{(1 - 0.0182(H - 10.71))}$$

If required the dry fuel/air ratio may be calculated from the following equation: Where:

$$(f/a) \text{ Stoich} = \frac{M_c + aM_H}{138.18(1 + a/4)}$$

$$X = \frac{DCO_2}{10^2} + \frac{DCO}{10^6} + \frac{DHC}{10^6}$$

$$K = 3.5$$

(e) The pollutant mass flow for each mode shall be calculated as follows:

$$\text{Gas mass} = u \times \text{Gas conc.} \times G_{EXHW}$$

$$\text{Gas mass} = v \times \text{Gas conc.} \times V_{EXHD}$$

$$\text{Gas mass} = w \times \text{Gas conc.} \times V_{EXHW}$$

The coefficients *u* (wet), *v* (dry), and *w* (wet) are to be used according to the following table:

| Gas | <i>u</i> | <i>v</i> | <i>w</i> | Conc. |
|-----------------------|----------|----------|----------|----------|
| NO _x | 0.001587 | 0.00205 | 0.00205 | ppm. |
| CO | 0.000966 | 0.00125 | 0.00125 | ppm. |
| HC | 0.000478 | | 0.000618 | ppm. |
| CO ₂ | 15.19 | 19.64 | 19.64 | percent. |
| O ₂ | 11.05 | 14.29 | 14.29 | percent. |

NOTE: The given coefficients *u*, *v*, and *w* are calculated for 273.15 °K (0 °C) and 101.3 kPa. In cases where the reference conditions vary from those stated, an error may occur in the calculations.

(f) The following equations may be used to calculate the coefficients *u*, *v*, and *w* in paragraph (e) of this section for other conditions of temperature and pressure.

(1) For ideal gases at 273.15 °K (0 °C) and 101.3 kPa:

For the calculation of *u*, *v*, and *w* for NO_x (as NO₂), CO, HC (in paragraph (e) of this section as H_{1.85}; CO₂; O₂

$$w = 4.4615 \cdot 10^{-5} \cdot M \text{ if conc. in ppm}$$

$$w = 4.4615 \cdot 10^{-1} \cdot M \text{ if conc. in percent}$$

$$v = w$$

$$u = w/P_{Air}$$

M=Molecular weight

*p*_{Air}=Density of dry air at 273.15 °K (0 °C), 101.3 kPa=1.293 kg/m³

(2) For real gases at 273.15 °K (0 °C) and 101.3 kPa: For the calculation of *u*, *v*, and *w*

$$w = \text{gas} \times 10^{-6} \text{ if conc. in ppm}$$

$$v = w$$

$$u = w/p_{Air}$$

*p*_{Gas} = Density of measured gas at 0 °C, 101.3 kPa in g/m³

(3) General formulas for the calculation of concentrations at temperature (designated as *T*) and pressure (designated as *p*):

—for ideal gases

$$\text{conc} \frac{\text{g}}{\text{m}_3} = \frac{M}{M_v} \times \frac{T_0}{T_0 + T} \times \frac{P}{P_0} \frac{\text{Conc(ppm)}}{10^6}$$

—for real gases

$$\text{conc} \frac{\text{g}}{\text{m}_3} = \rho_{Gas} \times \frac{T_0}{T_0 + T} \times \frac{P}{P_0} \frac{\text{Conc(ppm)}}{10^6}$$

with:

1% = 10⁴ ppm

M = Molecular weight in g/Mol

M_v = Molecular Volume = 22.414 × 10⁻³ m³/Mol for ideal gases

T = reference temperature 273.15 K

p = reference pressure 101.3 kPa

T = Temperature in °C

p = pressure in kPa

p_{Gas} = Density of the measured gas at 0 °C, 101.3 kPa

Conc. = Gas concentration

(g) The emission shall be calculated for all individual components in the following way:

$$\text{individual gas} = \frac{\sum_{i=1}^{i=n} \text{Gas Mass}_i \times \text{WF}_i}{\sum_{i=1}^{i=n-1} P_i \times \text{WF}_i}$$

The weighting factors and the number of modes (*n*) used in the above calculation are according to § 89.410-96.

§ 89.419-96 Dilute gaseous exhaust sampling and analytical system description.

(a) *General.* The exhaust gas sampling system described in this section is designed to measure the true mass of gaseous emissions in the exhaust of petroleum-fueled nonroad compression-ignition engines. This system utilizes the CVS concept (described in § 86.1310-90 of this chapter) of measuring mass emissions of HC, CO, and CO₂. A continuously integrated system is required for HC and NO_x measurement and is allowed for all CO and CO₂ measurements. The mass of gaseous emissions is determined from the sample concentration 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 CO₂. General requirements are as follows:

(1) This sampling system requires the use of a PDP-CVS and a heat exchanger or a CFV-CVS with either a heat exchanger or electronic flow compensation. Figure 2 in appendix A to this subpart is a schematic drawing of the PDP-CVS system. Figure 3 in appendix A to this subpart is a schematic drawing of the CFV-CVS system.

(2) The HC analytical system for petroleum-fueled compression-ignition engines requires a heated flame ionization detector (HFID) and heated sample system (191 ± 11 °C).

(i) The HFID sample must be taken directly from the diluted exhaust stream through a heated probe and integrated continuously over the test cycle. Unless compensation for varying flow is made, the HFID must be used with a constant flow system to ensure a representative sample.

(ii) The heated probe shall be located in the primary dilution tunnel and far enough downstream of the mixing chamber to ensure a uniform sample distribution across the CVS duct at the point of sampling.

(3) The CO and CO₂ analytical system requires:

(i) Bag sampling (see § 86.1309-90 of this chapter) and analytical capabilities (see § 86.1311-90 of this chapter), as shown in Figure 2 and Figure 3 in appendix A to this subpart; or

(ii) Continuously integrated measurement of diluted CO and CO₂ meeting the minimum requirements and technical specifications contained in paragraph (b)(4) of this section. Unless compensation for varying flow is made, a constant flow system must be used to ensure a representative sample.

(4) The NO_x analytical system requires a continuously integrated measurement of diluted NO_x meeting the minimum requirements and technical specifications contained in paragraph (b)(4) of this section. Unless compensation for varying flow is made, a constant flow system must be used to ensure a representative sample.

(5) 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 component systems. 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.

(6) Other sampling and/or analytical systems may be used if shown to yield

equivalent results and if approved in advance by the Administrator.

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

(1) *Exhaust dilution system.* The PDP-CVS shall conform to all of the requirements listed for the exhaust gas PDP-CVS in §86.1309-90(b) of this chapter. The CFV-CVS shall conform to all of the requirements listed for the exhaust gas CFV-CVS in §86.1309-90(c) of this chapter. 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 or below the temperature required for the measurement of hydrocarbon emissions noted in the following paragraph and to prevent condensation of water at any point in the dilution tunnel.

(ii) 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 for hydrocarbon measurement and as required to prevent condensation at any point in the dilution tunnel. Gaseous emission samples may be taken directly from this sampling point.

(iii) For the CFV-CVS, either a heat exchanger or electronic flow compensation is required (see Figure 3 in appendix A to this subpart).

(iv) For the CFV-CVS 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 condensation does not occur. The temperature measuring system (sensors and readout) shall have an accuracy and precision of ± 2 °C. For systems utilizing a flow compensator to maintain proportional flow, the requirement for maintaining constant temperature is not necessary.

(v) The primary dilution air shall have a temperature of 25 °C ± 5 °C.

(2) *Continuous HC measurement system.*

(i) The continuous HC sample system (as shown in Figure 2 or 3 in appendix A to this subpart) 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 §86.1321-90(b) of this chapter, 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 percent of the sample system flow rate.

(iv) The overflow gases shall enter the heated sample line as close as practical 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 (that is, 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 where possible at initial installation and after any major maintenance performed on the system. The profiling shall be accomplished using the insertion thermocouple probing technique. The system temperature will be monitored continuously during testing at the locations and temperature described in §86.1310-90(b)(3)(v).

(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 cm to 76 cm of the continuous hydrocarbon sampling system.

(B) Have a 0.48 cm minimum inside diameter.

(C) Be installed in the primary dilution tunnel at a point where the dilution air and exhaust are well mixed (that is, 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.

(E) Increase the gas stream temperature to 191 °C \pm 11 °C at the exit of the probe. The ability of the probe to accomplish this shall be demonstrated using the insertion thermocouple technique at initial installation and after any major maintenance. Compliance with the temperature specification shall be demonstrated by continuously recording 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) 20 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.

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

(3) *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;

(B) At least 46 cm in diameter; (engines below 110 kW may use a dilution tunnel that is 20 cm in diameter or larger)

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

(D) Electrically grounded.

(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.

(4) *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.

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

(ii) The continuous NO_x, CO, or CO₂ sampling and analysis system shall conform to the specifications of part 86, subpart D of this chapter with the following exceptions and revisions:

(A) The system components required to be heated by part 86, subpart D of this chapter need only be heated to prevent water condensation, the minimum component temperature shall be 55 °C.

(B) The system response shall be no greater than 20 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 of this chapter are not permitted for NO_x measurement in this subpart.

(D) All analytical gases must conform to the specifications of § 89.312-96.

(E) Any range on a linear analyzer below 155 ppm must have and use a calibration curve conforming to § 89.310-96.

(iii) The chart deflections or voltage output of analyzers with non-linear calibration curves shall be converted to concentration values by the calibration curve(s) specified in § 89.323-96 before flow correction (if used) and subsequent integration takes place.

§ 89.420-96 Background sample.

(a) Background samples are produced by drawing a sample of the dilution air during the 60 second exhaust collection phase of each test cycle mode.

(1) Individual background samples may be produced and analyzed for each mode. Hence, a unique background value will be used for the emission calculations for each mode.

(2) Alternatively, a single background sample may be produced by drawing a sample during the collection phase of each of the test cycle modes. Hence, a single cumulative background value will be used for the emission calculations for each mode.

(b) For analysis of the individual sample described in paragraph (a)(1) of this section, a single value representing the average chart deflection over a 10-second stabilized period is stored. All readings taken during the 10-second interval must be stable at the final value to within ± 1 percent of full scale.

(c) Measure HC, CO, CO₂, and NO_x exhaust and background concentrations in the sample bag(s) with approximately the same flow rates and pressures used during calibration.

§ 89.421-96 Exhaust gas analytical system; CVS bag sample.

(a) *Schematic drawings.* Figure 4 in appendix A to this subpart is a schematic drawing of the exhaust gas analytical system used for analyzing CVS bag samples from compression-ignition engines. Since various configurations can produce accurate results, exact conformance with the drawing 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 component systems. Other components such as snubbers, which are not needed to maintain accuracy in some systems, may be excluded if their exclusion is based upon good engineering judgment.

(b) *Major component description.* The analytical system, Figure 4 in appendix A to this subpart, consists of a flame ionization detector (FID) (heated for petroleum-fueled compression-ignition engines to 191 °C ± 6 °C) for the measurement of hydrocarbons, nondispersive

infrared analyzers (NDIR) for the measurement of carbon monoxide and carbon dioxide, and a chemiluminescence detector (CLD) (or HCLD) for the measurement of oxides of nitrogen. The exhaust gas analytical system shall conform to the following requirements:

(1) The CLD (or HCLD) requires that the nitrogen dioxide present in the sample be converted to nitric oxide before analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(2) If CO instruments are used which are essentially free of CO₂ and water vapor interference, the use of the conditioning column may be deleted. (See §§ 86.1322-84 and 86.1342-90 of this chapter.)

(3) A CO instrument will be considered to be essentially free of CO₂ and water vapor interference if its response to a mixture of 3 percent CO₂ in N₂, which has been bubbled through water at room temperature, produces an equivalent CO response, as measured on the most sensitive CO range, which is less than 1 percent of full scale CO concentration on ranges above 300 ppm full scale or less than 3 ppm on ranges below 300 ppm full scale. (See § 86.1322-84 of this chapter.)

(c) *Alternate analytical systems.* Analysis systems meeting the specifications of part 86, subpart D of this chapter (with the exception of §§ 86.346-79 and 86.347-79) may be used for the testing required under this subpart. Heated analyzers may be used in their heated configuration.

(d) Other analyzers and equipment. Other types of analyzers and equipment may be used if shown to yield equivalent results and if approved in advance by the Administrator.

§ 89.422-96 Dilute sampling procedures—CVS calibration.

(a) The CVS is calibrated using an accurate flowmeter and restrictor valve.

(1) The flowmeter calibration must be traceable to NIST measurements, and will serve as the reference value (NIST "true" value) for the CVS calibration. (Note: In no case should an upstream screen or other restriction which can affect the flow be used ahead of the flowmeter unless calibrated

throughout the flow range with such a device.)

(2) The CVS calibration procedures are designed for use of a "metering venturi" type flowmeter. Large radius or ASME flow nozzles are considered equivalent if traceable to NIST measurements. Other measurement systems may be used if shown to be equivalent under the test conditions in this section and traceable to NIST measurements.

(3) Measurements of the various flowmeter parameters are recorded and related to flow through the CVS.

(4) Procedures used by EPA for both PDP-CVS and CFV-CVS are outlined below. Other procedures yielding equivalent results may be used if approved in advance by the Administrator.

(b) After the calibration curve has been obtained, verification of the entire system may be performed by injecting a known mass of gas into the system and comparing the mass indicated by the system to the true mass injected. An indicated error does not necessarily mean that the calibration is wrong, since other factors can influence the accuracy of the system (for example, analyzer calibration, leaks, or HC hangup). A verification procedure is found in paragraph (e) of this section.

(c) *PDP-CVS calibration.* (1) The following calibration procedure outlines the equipment, the test configuration, and the various parameters which must be measured to establish the flow rate of the PDP-CVS pump.

(i) All the parameters related to the pump are simultaneously measured with the parameters related to a flowmeter which is connected in series with the pump.

(ii) The calculated flow rate, in (cm³/s), (at pump inlet absolute pressure and temperature) can then be plotted versus a correlation function which is the value of a specific combination of pump parameters.

(iii) The linear equation which relates the pump flow and the correlation function is then determined.

(iv) In the event that a CVS has a multiple speed drive, a calibration for each range used must be performed.

(2) This calibration procedure is based on the measurement of the absolute values of the pump and flowmeter parameters that relate the flow rate at each point. Two conditions must be maintained to assure the accuracy and integrity of the calibration curve:

(i) The temperature stability must be maintained during calibration. (Flowmeters are sensitive to inlet temperature oscillations; this can cause the data points to be scattered. Gradual changes in temperature are acceptable as long as they occur over a period of several minutes.)

(ii) All connections and ducting between the flowmeter and the CVS pump must be absolutely void of leakage.

(3) During an exhaust emission test the measurement of these same pump parameters enables the user to calculate the flow rate from the calibration equation.

(4) Connect a system as shown in Figure 5 in appendix A to this subpart. Although particular types of equipment are shown, other configurations that yield equivalent results may be used if approved in advance by the Administrator. For the system indicated, the following measurements and accuracies are required:

CALIBRATION DATA MEASUREMENTS

| Parameter | Symbol | Units | Sensor-readout tolerances |
|---|--------|---------------------------|---------------------------|
| Barometric pressure (corrected) | P_B | kPa | ±.34 kPa |
| Ambient temperature | T_A | °C | ±.3 °C |
| Air temperature into metering venturi | ETI | °C | ±1.1 °C |
| Pressure drop between the inlet and throat of metering venturi. | EDP | kPa | ±.01 kPa |
| Air flow | Q_s | m ³ /min | ±.5% of NIST value. |
| Air temperature at CVS pump inlet | PTI | °C | ±1.1 °C |
| Pressure depression at CVS pump inlet | PPI | kPa | ±.055 kPa |
| Pressure head at CVS pump outlet | PPO | kPa | ±.055 kPa |
| Air temperature at CVS pump outlet (optional) | PTO | °C | ±1.1 °C |
| Pump revolutions during test period | N | Revs | ±1 Rev. |
| Elapsed time for test period | t | s | ±.5 s. |

(5) After the system has been connected as shown in Figure 5 in appendix A to this subpart, set the variable restrictor in the wide open position and run the CVS pump for 20 minutes. Record the calibration data.

(6) Reset the restrictor valve to a more restricted condition in an increment of pump inlet depression that will yield a minimum of six data points for the total calibration. Allow the system to stabilize for 3 minutes and repeat the data acquisition.

(7) Data analysis:

(i) The air flow rate, Q_s , at each test point is calculated in standard cubic meters per minute (0 °C, 101.3 kPa) from the flowmeter data using the manufacturer's prescribed method.

(ii) The air flow rate is then converted to pump flow, V_o , in cubic meter per revolution at absolute pump inlet temperature and pressure:

$$V_o = \frac{Q_s}{n} \times \frac{T_p}{273} \times \frac{101.3}{P_p}$$

Where:

V_o =Pump flow, (m³/rev) at T_p , P_p .

Q_s =Meter air flow rate in standard cubic meters per minute, standard conditions are 0 °C, 101.3 kPa.

n =Pump speed in revolutions per minute.

T_p =Pump inlet temperature °K= P_i+273 °K, P_i =Pump inlet temp °C

P_p =Absolute pump inlet pressure, (kPa) = $P_B - P_{Pi}$

Where:

P_B =barometric pressure, (kPa).

P_{Pi} =Pump inlet depression, (kPa).

(iii) The correlation function at each test point is then calculated from the calibration data:

$$X_o = \frac{1}{n} \sqrt{\left(\frac{\Delta p}{P_c} \right)}$$

X_o =correlation function.

Δp =The pressure differential from pump inlet to pump outlet, (kPa).

= $P_c - P_p$.

P_c =Absolute pump outlet pressure, (kPa)

= $P_B + P_{Po}$

Where:

P_{Po} =Pressure head at pump outlet, (kPa).

(iv) A linear least squares fit is performed to generate the calibration equation which has the form:

$$V_o = D_o - M(X_o)$$

D_o and M are the intercept and slope constants, respectively, describing the regression line.

(8) A CVS system that has multiple speeds must be calibrated on each speed used. The calibration curves generated for the ranges will be approximately parallel and the intercept values, D_o , will increase as the pump flow range decreases.

(9) If the calibration has been performed carefully, the calculated values from the equation will be within ±0.50 percent of the measured value of V_o . Values of M will vary from one pump to another, but values of D_o for pumps of the same make, model, and range should agree within ±3 percent of each other. Calibrations should be performed at pump start-up and after major maintenance to assure the stability of the pump slip rate. Analysis of mass injection data will also reflect pump slip stability.

(d) *CFV-CVS calibration.* (1) Calibration of the CFV is based upon the flow equation for a critical venturi. Gas flow is a function of inlet pressure and temperature:

$$Q_s = \frac{K_v P}{\sqrt{T}}$$

Where:

Q_s =flow.

K_v =calibration coefficient.

P =absolute pressure.

T =absolute temperature.

The calibration procedure described in paragraph (d)(3) of this section establishes the value of the calibration coefficient at measured values of pressure, temperature, and air flow.

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

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

CALIBRATION DATA MEASUREMENTS

| Parameter | Symbol | Units | Tolerances |
|---|--------|---------------------------|---------------------|
| Barometric Pressure (corrected) | P_B | kPa | ±.34 kPa |
| Air temperature, into flowmeter | ETI | °C | (±.3 °C) |
| Pressure drop between the inlet and throat of metering venturi. | EDP | kPa | ±.01 kPa |
| Air flow | Q_s | m ³ /min. | ±.5% of NIST value. |
| CFV inlet depression | PPI | kPa | ±.055 kPa |
| Temperature at venturi inlet | T_v | °C | ±2.2 °C |

(4) Set up equipment as shown in Figure 6 in appendix A to subpart and eliminate leaks. (Leaks between the flow measuring devices and the critical flow venturi will seriously affect the accuracy of the calibration.)

(5) Set the variable flow restrictor to the open position, start the blower, and allow the system to stabilize. Record data from all instruments.

(6) Vary the flow restrictor and make at least eight readings across the critical flow range of the venturi.

(7) *Data analysis.* The data recorded during the calibration are to be used in the following calculations:

(i) The air flow rate (designated as Q_s) at each test point is calculated in standard cubic feet per minute from the flow meter data using the manufacturer's prescribed method.

(ii) Calculate values of the calibration coefficient for each test point:

$$K_v = \frac{Q_s \sqrt{T_v}}{P_v}$$

Where:

Q_s = Flow rate in standard cubic meter per minute, at the standard conditions of 0 °C, 101.3 kPa.

T_v = Temperature at venturi inlet, °K.
 P_v = $P_B - PPI$ (= Pressure at venturi inlet, kPa)

Where:

P_{PI} = Venturi inlet pressure depression, (kPa).

(iii) Plot K_v as a function of venturi inlet pressure. For choked flow, K_v will have a relatively constant value. As pressure decreases (vacuum increases), the venturi becomes unchoked and K_v decreases. (See Figure 7 in appendix A to this subpart.)

(iv) For a minimum of eight points in the critical region calculate an average K_v and the standard deviation.

(v) If the standard deviation exceeds 0.3 percent of the average K_v , take corrective action.

(e) *CVS system verification.* The following "gravimetric" technique can be used to verify that the CVS and analytical instruments can accurately measure a mass of gas that has been injected into the system. (Verification can also be accomplished by constant flow metering using critical flow orifice devices.)

(1) Obtain a small cylinder that has been charged with 99.5 percent or greater propane or carbon monoxide gas (Caution—carbon monoxide is poisonous).

(2) Determine a reference cylinder weight to the nearest 0.01 grams.

(3) Operate the CVS in the normal manner and release a quantity of pure propane into the system during the sampling period (approximately 5 minutes).

(4) The calculations are performed in the normal way except in the case of propane. The density of propane (0.6109 kg/m³/carbon atom) is used in place of the density of exhaust hydrocarbons.

(5) The gravimetric mass is subtracted from the CVS measured mass and then divided by the gravimetric mass to determine the percent accuracy of the system.

(6) Good engineering practice requires that the cause for any discrepancy greater than ±2 percent must be found and corrected.

§ 89.423-96 CVS calibration frequency.

The CVS positive displacement pump or critical flow venturi shall be calibrated following initial installation, major maintenance or as necessary when indicated by the CVS system verification (described in § 89.352-96(e)).

§ 89.424-96 Dilute emission sampling calculations.

(a) The final reported emission test results are computed by use of the following formula:

$$A_{WM} = \frac{\sum_{i=1}^{i=n} (g_i \times WF_i)}{\sum_{i=1}^{i=n-1} (kW - hr_i \times WF_i)}$$

Where:

A_{wm} = Weighted mass emission level (HC, CO, CO₂, or NO_x) in grams per kilowatt-hour.

g_i = Mass emission level in grams, measured during the mode.

WF_i = Effective weighing factor.

$kW-hr_i$ = Total kilowatt-hours (kilowatts integrated over time) for the mode.

(b) The mass of each pollutant for each mode for bag measurements and diesel heat exchanger system measurements is determined from the following equations:

(1) Hydrocarbon mass:

$$HC_{mass} = V_{mix} \times Density_{HC} \times (HC_{conc}/10^6)$$

(2) Oxides of nitrogen mass:

$$NO_{xmass} = V_{mix} \times Density_{NO_2} \times KH \times (NO_{xconc}/10^6)$$

(3) Carbon monoxide mass:

$$CO_{mass} = V_{mix} \times Density_{CO} \times (CO_{conc}/10^6)$$

(4) Carbon dioxide mass:

$$CO_{2mass} = V_{mix} \times Density_{CO_2} \times (CO_{2conc}/10^6)$$

(c) The mass of each pollutant for the mode for flow compensated sample systems is determined from the following equations:

$$HC_{mass} = V_{mix} \times Density_{HC} \frac{HC_e - HC_d \left(1 - \frac{1}{DF}\right)}{10^6}$$

$$NO_{xmass} = K_H \frac{NO_{x_e} - NO_{x_d} \left(1 - \frac{1}{DF}\right)}{10^6} V_{mix} \times Density_{NO_2}$$

$$CO_{mass} = V_{mix} \times Density_{CO} \frac{CO_c - CO_d \left(1 - \frac{1}{DF}\right)}{10^6}$$

$$CO_{2mass} = V_{mix} \times Density_{CO_2} \frac{CO_{2_e} - CO_{2_d} \left(1 - \frac{1}{DF}\right)}{10^6}$$

(d) Meaning of symbols:

(1) For hydrocarbon equations:

HC_{mass} = Hydrocarbon emissions, in grams per test mode.

$Density_{HC}$ = Density of hydrocarbons is (5800 kg/m³) for #1 diesel, and (0.5746 kg/m³) for #2 diesel, assuming an average carbon to hydrogen

ratio of 1:1.93 for #1 diesel, and 1:1.80 for #2 diesel at 20 °C and 101.3 kPa pressure.

HC_{conc} = Hydrocarbon concentration of the dilute exhaust sample corrected for background, in ppm carbon equivalent (that is, equivalent propane times 3).

$$HC_{conc} = HC_e - HC_d \left(1 - \frac{1}{DF} \right)$$

Where:

HC_e = Hydrocarbon concentration of the dilute exhaust bag sample or, for diesel heat exchanger systems, average hydrocarbon concentration of the dilute exhaust sample as calculated from the integrated HC traces, in ppm carbon equivalent. For flow compensated sample systems (HC_e)_i is the instantaneous concentration.

HC_d = Hydrocarbon concentration of the dilution air as measured, in ppm carbon equivalent.

(2) For oxides of nitrogen equations:

NO_{Xmass} = Oxides of nitrogen emissions, in grams per test mode.

Density NO_2 = Density of oxides of nitrogen is 1.913 kg/m³, assuming they are in the form of nitrogen dioxide, at 20 °C and 101.3 kPa pressure.

NO_{Xconc} = Oxides of nitrogen concentration of the dilute exhaust sample corrected for background, in ppm:

$$NO_{Xconc} = NO_{X_e} - NO_{X_d} \left(1 - \frac{1}{DF} \right)$$

Where:

NO_{X_e} = Oxides of nitrogen concentration of the dilute exhaust bag sample as measured, in ppm. For flow compensated sample systems (NO_{X_e})_i is the instantaneous concentration.

NO_{X_d} = Oxides of nitrogen concentration of the dilute air as measured, in ppm.

(3) For carbon monoxide equations:

CO_{mass} = Carbon monoxide emissions, grams per test mode. $Density_{CO}$ = Density of carbon monoxide (1.164 kg/m³ at 20 °C and 101.3 kPa pressure).

CO_{conc} = Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor, and CO₂ extraction, ppm.

$$CO_{conc} = CO_e - CO_d \left(1 - \frac{1}{DF} \right)$$

Where:

CO_e = Carbon monoxide concentration of the dilute exhaust bag sample volume corrected for water vapor and carbon dioxide extraction, ppm. For flow compensated sample systems, (CO_e)_i is the instantaneous concentration.

The following calculation assumes the carbon to hydrogen ratio of the fuel is 1:1.85. As an option the measured actual carbon to hydrogen ratio may be used:

$$CO_e = [1 - 0.01925CO_{2e} - 0.000323R] CO_{em}$$

Where:

CO_{em} = Carbon monoxide concentration of the dilute exhaust sample as measured, ppm.

CO_{2e} = Carbon dioxide concentration of the dilute exhaust bag sample, in percent, if measured. For flow compensated sample systems, (CO_{2e})_i is the instantaneous concentration. For cases where exhaust sampling of CO₂ is not performed, the following approximation is permitted:

$$CO_{2_e} = \frac{44.010}{12.011 + 1.008\alpha} \frac{M^1 453.6}{Density_{CO_2}} \frac{100}{V_{mix}}$$

^a=Average carbon to hydrogen ratio.

M^1 = Fuel mass consumed during the test cycle.

R = Relative humidity of the dilution air, percent.

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CO_d =Carbon monoxide concentration of the dilution air corrected for water vapor extraction, ppm.

$$CO_d = (1 - 0.000323R)CO_{dm}$$

Where:

CO_{dm} =Carbon monoxide concentration of the dilution air sample as measured, ppm.

NOTE: If a CO instrument which meets the criteria specified in §86.1311-90 of this chapter is used and the conditioning column has been deleted, CO_{em} must be substituted directly for CO_e and CO_{dm} must be substituted directly for CO_d .

(4) For carbon dioxide equation:

CO_{2mass} =Carbon dioxide emissions, in grams per test mode.

Density CO_2 =Density of carbon dioxide is 1.830 kg/m³, at 20 °C and 760 mm Hg pressure.

CO_{2conc} =Carbon dioxide concentration of the dilute exhaust sample corrected for background, in percent.

$$CO_{2mass} = CO_{2e} - CO_{2d} \left(1 - \frac{1}{DF} \right)$$

Where:

CO_{2d} =Carbon dioxide concentration of the dilution air as measured, in percent.

$$(5) DF = \frac{13.4}{CO_{2e} + (HC_e + CO_e \times 10^{-4})}, \text{ or } DF = \frac{13.4}{CO_{2e}}$$

(6) KH =Humidity correction factor. For compression-ignition engines:

$$KH = 1/[1 - 0.0182(H - 10.71)].$$

Where:

H =Absolute humidity of the engine intake air in grams of water per kilogram of dry air and

$$H = (6.211)R_i \times P_d / (P_b - (P_d \times R_i / 100))$$

Where:

R_i =Relative humidity of the engine intake air, in percent.

P_d =Saturated vapor pressure (kPa) at the engine intake air dry bulb temperature.

P_b =Barometric pressure (kPa).

(e) The final reported brake-specific fuel consumption ($BSFC$) shall be computed by use of the following formula:

$$BSFC = \frac{M}{kW - hr}$$

$$G_s = \left[\frac{12.011}{12.011 + \alpha(1.008)} \right] HC_{mass} + 0.429CO_{mass} + 0.273CO_{2mass}$$

R_2 =Grams C in fuel per gram of fuel
Where:

Where:

$BSFC$ =brake-specific fuel consumption in grams of fuel per kilowatt-hr (kW-hr)

M =mass of fuel in grams, used by the engine during a mode

kW-hr=total kilowatts integrated with respect to time for a mode

(f) The mass of fuel for the mode is determined from mass fuel flow measurements made during the mode, or from the following equation:

$$M = \left(\frac{G_s}{R_2} \right) \left(\frac{1}{273.15} \right)$$

Where:

M =Mass of fuel, in grams, used by the engine during the mode.

G_s =Grams of carbon measured during the mode:

HC_{mass} =hydrocarbon emissions, in grams for the mode

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CO_{2mass} =carbon monoxide emissions, in grams for the mode
 CO_{2mass} =carbon dioxide emissions, in grams for the mode
 α =The atomic hydrogen to carbon ratio of the fuel.

§ 89.425-96 Particulate adjustment factor.

The following equation may be used to adjust the particulate measurement when the test fuel specified in Table 4 of Subpart D of this Part is used:

$$PM_{adj} = PM - [BSFC * 0.0917 * (FSF - USLF_{CA})]$$

Where:

PM_{adj} =adjusted measured PM level [g/Kw-hr]

PM =measured weighted PM level [g/Kw-hr]

$BSFC$ =measured brake specific fuel consumption [G/Kw-hr]

FSF =fuel sulfur weight fraction

$USLF_{CA}$ =upper sulfur level weight fraction of California specification.

This adjustment only applies to engines with no exhaust gas after treatment. No adjustment is provided for engines with exhaust gas after treatment.

APPENDIX A TO SUBPART E—FIGURES

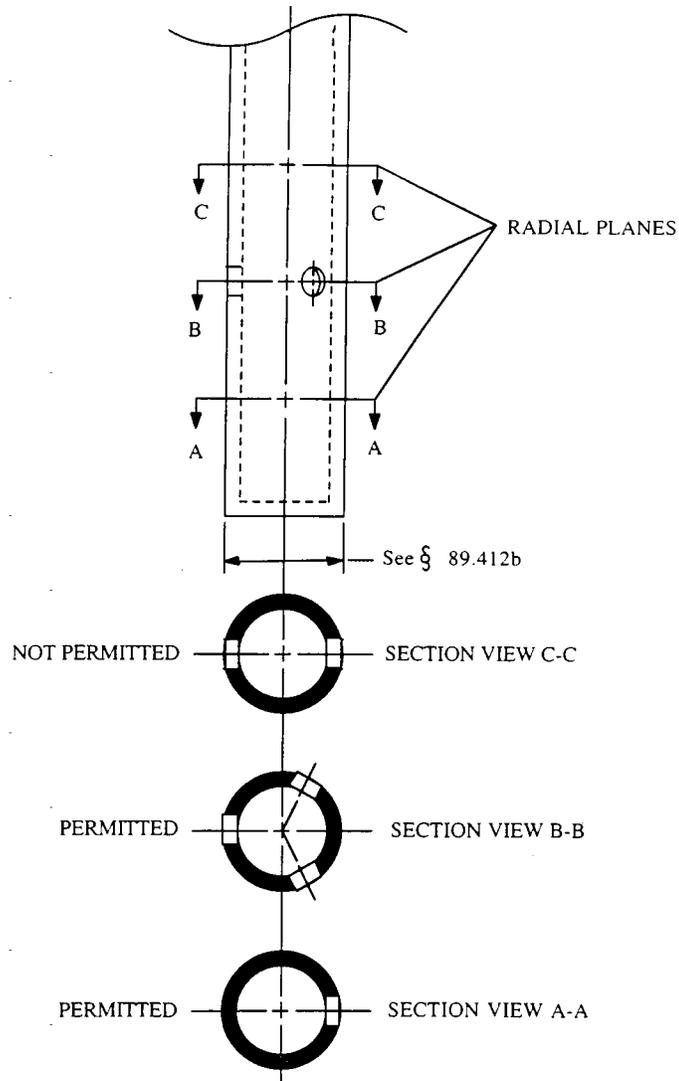


Figure 1.--SAMPLE PROBE AND TYPICAL HOLE SPACING

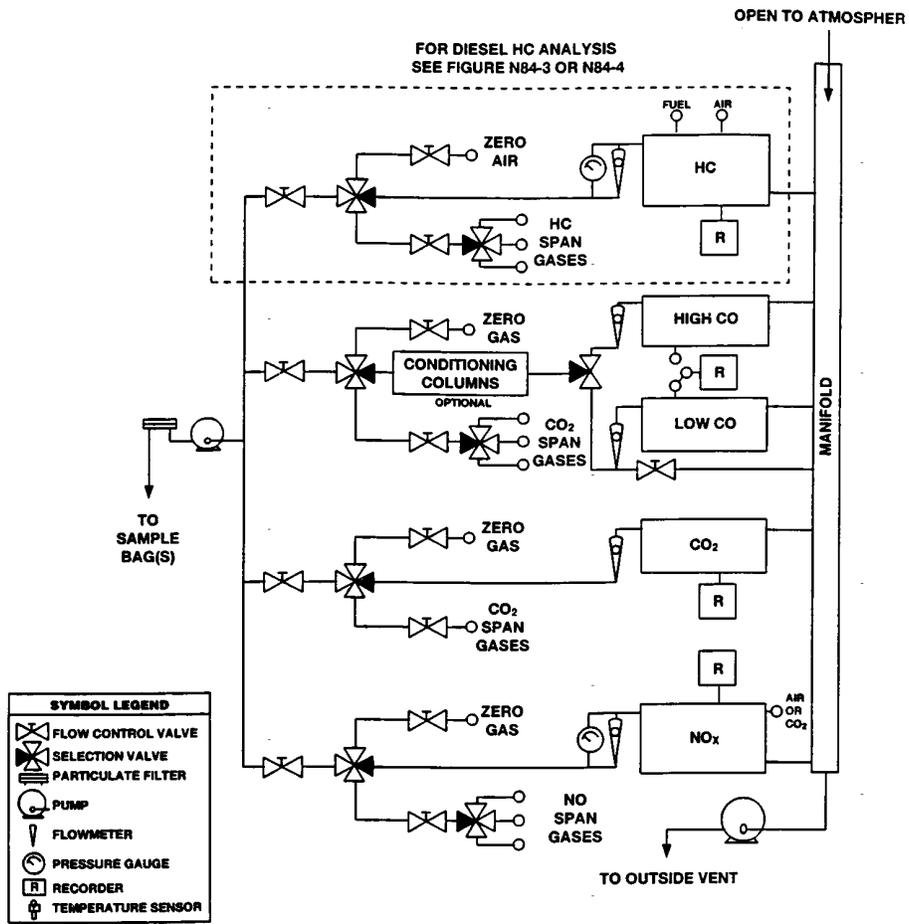


Figure 4. — Exhaust Gas Analytical System

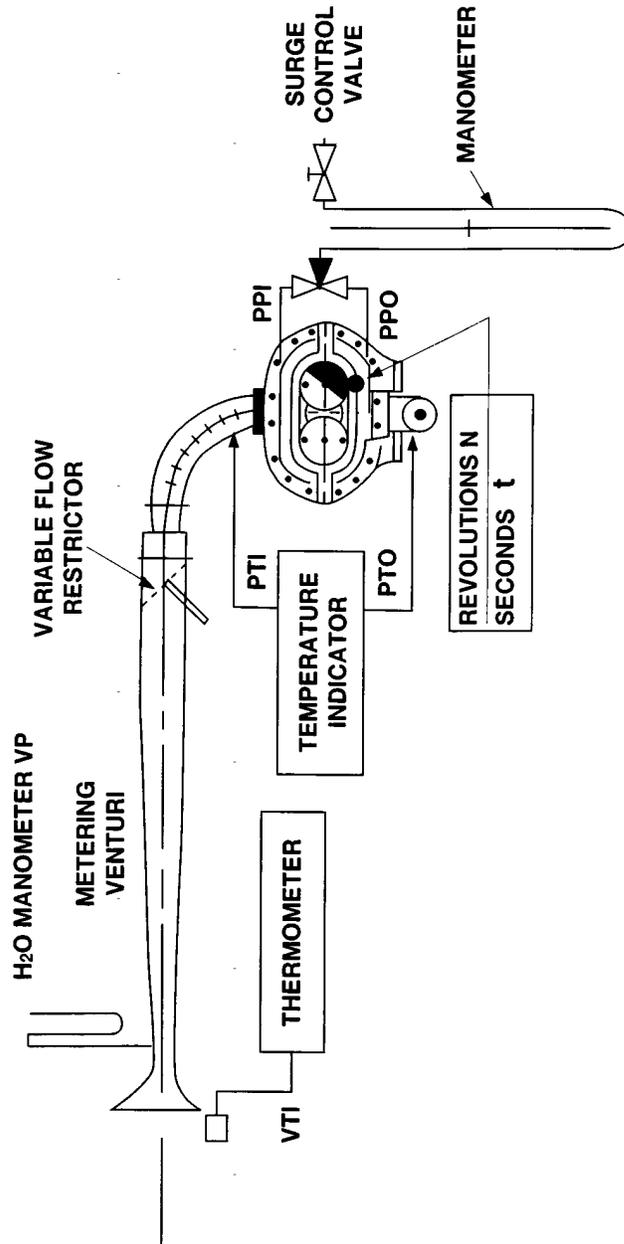


Figure 5. — PDP-CVS Calibration Configuration

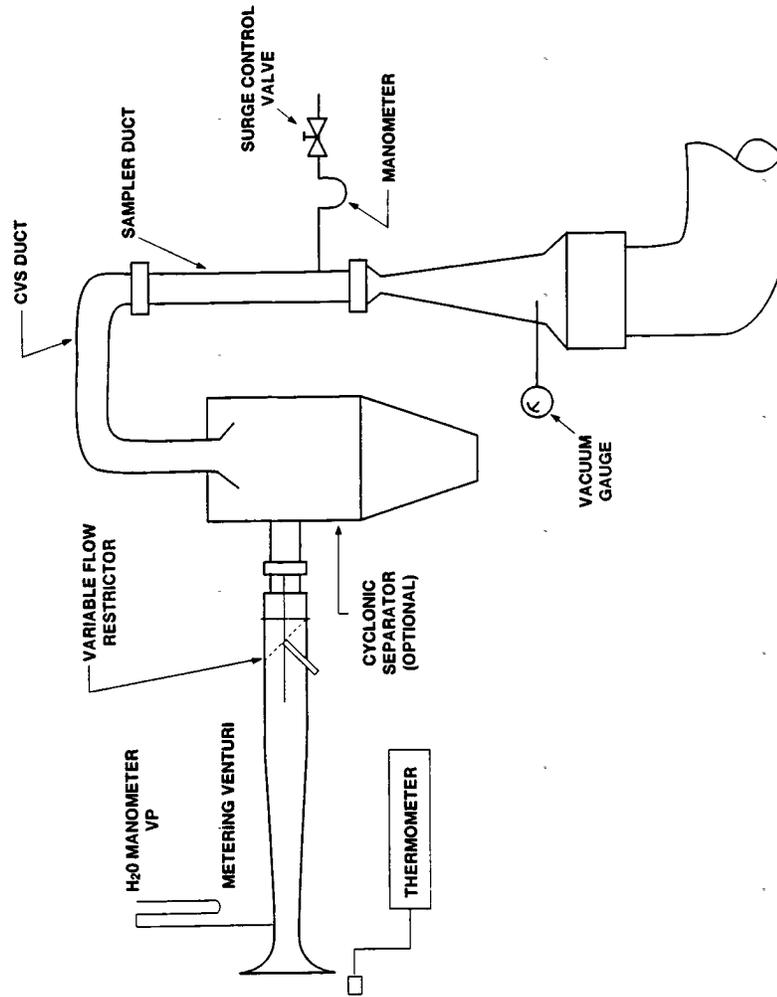


Figure 6. — CFV-CVS Calibration Configuration

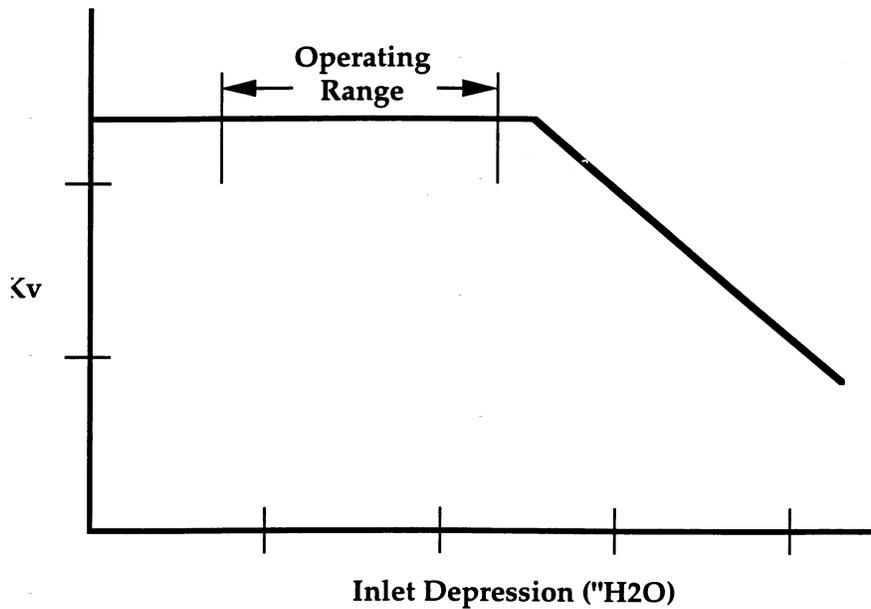


Figure 7.—Sonic Flow Choking

APPENDIX B TO SUBPART E—TABLE 1

TABLE 1.—8. MODE TEST CYCLE (MY96 AND LATER)

| Test segment | Mode No. | Engine speed ⁽¹⁾ | Observed torque ⁽²⁾ (percent of maximum observed) | Time in mode (minutes) | | Weighting factors |
|--------------|----------|-----------------------------|---|------------------------|------|-------------------|
| | | | | Min | Max | |
| 1 | 1 | Rated | 100 | 5.0 | 20.0 | 0.15 |
| 1 | 2 | Rated | 75 | 5.0 | 20.0 | 0.15 |
| 1 | 3 | Rated | 50 | 5.0 | 20.0 | 0.15 |
| 1 | 4 | Rated | 10 | 5.0 | 20.0 | 0.10 |
| 2 | 5 | Int | 100 | 5.0 | 20.0 | 0.10 |
| 2 | 6 | Int | 75 | 5.0 | 20.0 | 0.10 |
| 2 | 7 | Int | 50 | 5.0 | 20.0 | 0.10 |
| 2 | 8 | Idle | 0 | 5.0 | 20.0 | 0.15 |

⁽¹⁾ Engine speed (non-idle): ±1 percent of rated or ±3 rpm, which ever is greater. Engine speed (idle): Within manufacturer's specifications. Rated speed, intermediate speed, and idle speed are specified by the manufacturer. If no intermediate speed is stated, 60 percent of rated speed shall be used.

⁽²⁾ Torque (non-idle): Throttle fully open for 100 percent points. Other non-idle points: ±2 percent of set point. Torque (idle): Throttle fully closed. Load less than 5 percent of peak torque.

Subpart F—Selective Enforcement Auditing

§ 89.501-96 Applicability.

The requirements of subpart F are applicable to all nonroad engines subject to the provisions of subpart A of part 89.

§ 89.502-96 Definitions.

The definitions in subpart A of this part apply to this subpart. The following definitions also apply to this subpart.

Acceptable quality level (AQL) means the maximum percentage of failing engines that can be considered a satisfactory process average for sampling inspections.

Configuration means any subclassification of an engine family which can be described on the basis of gross power, emission control system, governed speed, injector size, engine calibration, and other parameters as designated by the Administrator.

Inspection criteria means the pass and fail numbers associated with a particular sampling plan.

Test engine means an engine in a test sample.

Test sample means the collection of engines selected from the population of an engine family for emission testing.

§ 89.503-96 Test orders.

(a) A test order addressed to the manufacturer is required for any testing under this subpart.

(b) The test order is signed by the Assistant Administrator for Air and Radiation or his or her designee. The test order must be delivered in person by an EPA enforcement officer or EPA authorized representative to a company representative or sent by registered mail, return receipt requested, to the manufacturer's representative who signed the application for certification submitted by the manufacturer, pursuant to the requirements of the applicable section of subpart B of this part. Upon receipt of a test order, the manufacturer must comply with all of the provisions of this subpart and instructions in the test order.

(c) *Information included in test order.*

(1) The test order will specify the engine family to be selected for testing,

the manufacturer's engine assembly plant or associated storage facility or port facility (for imported engines) from which the engines must be selected, the time and location at which engines must be selected, and the procedure by which engines of the specified family must be selected. The test order may specify the configuration to be audited and/or the number of engines to be selected per day. Engine manufacturers are required to select a minimum of four engines per day unless an alternate selection procedure is approved pursuant to § 89.507-96(a), or unless total production of the specified configuration is less than four engines per day. If total production of the specified configuration is less than four engines per day, the manufacturer selects the actual number of engines produced per day.

(2) The test order may include alternate families to be selected for testing at the Administrator's discretion in the event that engines of the specified family are not available for testing because those engines are not being manufactured during the specified time or are not being stored at the specified assembly plant, associated storage facilities, or port of entry.

(3) If the specified family is not being manufactured at a rate of at least two engines per day in the case of manufacturers specified in § 89.508-96(g)(1), or one engine per day in the case of manufacturers specified in § 89.508-96(g)(2), over the expected duration of the audit, the Assistant Administrator or her or his designated representative may select engines of the alternate family for testing.

(4) In addition, the test order may include other directions or information essential to the administration of the required testing.

(d) A manufacturer may submit a list of engine families and the corresponding assembly plants, associated storage facilities, or (in the case of imported engines) port facilities from which the manufacturer prefers to have engines selected for testing in response to a test order. In order that a manufacturer's preferred location be considered for inclusion in a test order for a particular engine family, the list must be submitted prior to issuance of the test

order. Notwithstanding the fact that a manufacturer has submitted the list, the Administrator may order selection at other than a preferred location.

(e) Upon receipt of a test order, a manufacturer must proceed in accordance with the provisions of this subpart.

(f)(1) During a given model year, the Administrator may not issue to a manufacturer more Selective Enforcement Auditing (SEA) test orders than an annual limit determined to be the larger of the following factors:

(i) Production factor, determined by dividing the projected nonroad engine sales in the United States for that model year, as declared by the manufacturer under § 89.505-96(c)(1), by 16,000 and rounding to the nearest whole number. If the projected sales are less than 8,000, this factor is one.

(ii) Family factor, determined by dividing the manufacturer's total number of certified engine families by five and rounding to the nearest whole number.

(2) If a manufacturer submits to EPA in writing prior to or during the model year a reliable sales projection update or adds engine families or deletes engine families from its production, that information is used for recalculating the manufacturer's annual limit of SEA test orders.

(3) Any SEA test order for which the family fails under § 89.510-96 or for which testing is not completed is not counted against the annual limit.

(4) When the annual limit has been met, the Administrator may issue additional test orders to test those families for which evidence exists indicating noncompliance. An SEA test order issued on this basis will include a statement as to the reason for its issuance.

§ 89.504-96 Testing by the Administrator.

(a) The Administrator may require by test order under § 89.503-96 that engines of a specified family be selected in a manner consistent with the requirements of § 89.507-96 and submitted to the Administrator at the place designated for the purpose of conducting emission tests. These tests will be conducted in accordance with § 89.508-96 to

determine whether engines manufactured by the manufacturer conform with the regulations with respect to which the certificate of conformity was issued.

(b) *Designating official data.* (1) Whenever the Administrator conducts a test on a test engine or the Administrator and manufacturer each conduct a test on the same test engine, the results of the Administrator's test comprise the official data for that engine.

(2) Whenever the manufacturer conducts all tests on a test engine, the manufacturer's test data is accepted as the official data, provided that if the Administrator makes a determination based on testing conducted under paragraph (a) of this section that there is a substantial lack of agreement between the manufacturer's test results and the Administrator's test results, no manufacturer's test data from the manufacturer's test facility will be accepted for purposes of this subpart.

(c) If testing conducted under § 89.503-96 is unacceptable under paragraph (b)(2) of this section, the Administrator must:

(1) Notify the manufacturer in writing of the Administrator's determination that the test facility is inappropriate for conducting the tests required by this subpart and the reasons therefor; and

(2) Reinstate any manufacturer's data upon a showing by the manufacturer that the data acquired under § 89.503-96 was erroneous and the manufacturer's data was correct.

(d) The manufacturer may request in writing that the Administrator reconsider the determination in paragraph (b)(2) of this section based on data or information which indicates that changes have been made to the test facility and these changes have resolved the reasons for disqualification.

§ 89.505-96 Maintenance of records; submittal of information.

(a) The manufacturer of any new nonroad engine subject to any of the provisions of this subpart must establish, maintain, and retain the following adequately organized and indexed records:

(1) *General records.* A description of all equipment used to test engines in

accordance with § 89.508-96 pursuant to a test order issued under this subpart, specifically, the equipment requirements specified in §§ 86.884-8 and 86.884-9 of this chapter and the equipment requirements specified in §§ 89.306-96, 89.308-96, 89.309-96, and 89.312-96.

(2) *Individual records.* These records pertain to each audit conducted pursuant to this subpart and include:

(i) The date, time, and location of each test;

(ii) The number of hours of service accumulated on the engine when the test began and ended;

(iii) The names of all supervisory personnel involved in the conduct of the audit;

(iv) A record and description of any repairs performed prior to and/or subsequent to approval by the Administrator, giving the date, associated time, justification, name(s) of the authorizing personnel, and names of all supervisory personnel responsible for the conduct of the repair;

(v) The date the engine was shipped from the assembly plant, associated storage facility or port facility, and date the engine was received at the testing facility;

(vi) A complete record of all emission tests performed pursuant to this subpart (except tests performed directly by EPA), including all individual worksheets and/or other documentation relating to each test, or exact copies thereof, to be in accordance with the record requirements specified in § 89.404-96 or § 86.884-10 of this chapter.

(vii) A brief description of any significant audit events not described under paragraph (a)(2) of this section, commencing with the test engine selection process and including such extraordinary events as engine damage during shipment.

(3) The manufacturer must record test equipment description, pursuant to paragraph (a)(1) of this section, for each test cell that can be used to perform emission testing under this subpart.

(b) The manufacturer must retain all records required to be maintained under this subpart for a period of one year after completion of all testing in response to a test order. Records may be retained as hard copy or reduced to

microfilm, floppy disc, and so forth, depending upon the manufacturer's record retention procedure; provided, that in every case, all the information contained in the hard copy is retained.

(c) The manufacturer must, upon request by the Administrator, submit the following information with regard to engine production:

(1) Projected production for each engine configuration within each engine family for which certification is requested;

(2) Number of engines, by configuration and assembly plant, scheduled for production for the time period designated in the request;

(3) Number of engines, by configuration and by assembly plant, storage facility or port facility, scheduled to be stored at facilities for the time period designated in the request; and

(4) Number of engines, by configuration and assembly plant, produced during the time period designated in the request that are complete for introduction into commerce.

(d) Nothing in this section limits the Administrator's discretion in requiring the manufacturer to retain additional records or submit information not specifically required by this section.

(e) All reports, submissions, notifications, and requests for approvals made under this subpart are addressed to: Director, Manufacturers Operations Division, U.S. Environmental Protection Agency, 6405-J, 401 M Street SW, Washington, DC 20460.

§ 89.506-96 Right of entry and access.

(a) To allow the Administrator to determine whether a manufacturer is complying with the provisions of this subpart and a test order issued thereunder, EPA enforcement officers or EPA authorized representatives may enter during operating hours and upon presentation of credentials any of the following places:

(1) Any facility where any engine to be introduced into commerce, including ports of entry, or any emission-related component is manufactured, assembled, or stored;

(2) Any facility where any tests conducted pursuant to a test order or any procedures or activities connected with these tests are or were performed;

(3) Any facility where any engine which is being tested, was tested, or will be tested is present; and

(4) Any facility where any record or other document relating to any of the above is located.

(b) Upon admission to any facility referred to in paragraph (a) of this section, EPA enforcement officers or EPA authorized representatives are authorized to perform the following inspection-related activities:

(1) To inspect and monitor any aspects of engine manufacture, assembly, storage, testing and other procedures, and the facilities in which these procedures are conducted;

(2) To inspect and monitor any aspect of engine test procedures or activities, including, but not limited to, engine selection, preparation, service accumulation, emission test cycles, and maintenance and verification of test equipment calibration;

(3) To inspect and make copies of any records or documents related to the assembly, storage, selection, and testing of an engine in compliance with a test order; and

(4) To inspect and photograph any part or aspect of any engine and any component used in the assembly thereof that is reasonably related to the purpose of the entry.

(c) EPA enforcement officers or EPA authorized representatives are authorized to obtain reasonable assistance without cost from those in charge of a facility to help the officers perform any function listed in this subpart and they are authorized to request the recipient of a test order to make arrangements with those in charge of a facility operated for the manufacturer's benefit to furnish reasonable assistance without cost to EPA whether or not the recipient controls the facility.

(1) Reasonable assistance includes, but is not limited to, clerical, copying, interpretation and translation services; the making available on an EPA enforcement officer's or EPA authorized representative's request of personnel of the facility being inspected during their working hours to inform the EPA enforcement officer or EPA authorized representative of how the facility operates and to answer the officer's or representative's questions; and the per-

formance on request of emission tests on any engine which is being, has been, or will be used for SEA testing.

(2) A manufacturer may be compelled to cause the personal appearance of any employee at such a facility before an EPA enforcement officer or EPA authorized representative by written request for his appearance, signed by the Assistant Administrator for Air and Radiation, served on the manufacturer. Any such employee who has been instructed by the manufacturer to appear will be entitled to be accompanied, represented, and advised by counsel.

(d) EPA enforcement officers or EPA authorized representatives are authorized to seek a warrant or court order authorizing the EPA enforcement officers or EPA authorized representatives to conduct activities related to entry and access as authorized in this section, as appropriate, to execute the functions specified in this section. EPA enforcement officers or authorized representatives may proceed ex parte to obtain a warrant whether or not the EPA enforcement officers or EPA authorized representatives first attempted to seek permission of the recipient of the test order or the party in charge of the facilities in question to conduct activities related to entry and access as authorized in this section.

(e) A recipient of a test order must permit an EPA enforcement officer(s) or EPA authorized representative(s) who presents a warrant or court order to conduct activities related to entry and access as authorized in this section and as described in the warrant or court order. The recipient must also cause those in charge of its facility or a facility operated for its benefit to permit entry and access as authorized in this section pursuant to a warrant or court order whether or not the recipient controls the facility. In the absence of a warrant or court order, an EPA enforcement officer(s) or EPA authorized representative(s) may conduct activities related to entry and access as authorized in this section only upon the consent of the recipient of the test order or the party in charge of the facilities in question.

(f) It is not a violation of this part or the Clean Air Act for any person to refuse to permit an EPA enforcement

officer(s) or EPA authorized representative(s) to conduct activities related to entry and access as authorized in this section if the officer(s) or representative(s) appears without a warrant or court order.

(g) A manufacturer is responsible for locating its foreign testing and manufacturing facilities in jurisdictions where local law prohibits an EPA enforcement officer(s) or EPA authorized representative(s) from conducting the entry and access activities specified in this section. EPA will not attempt to make any inspections which it has been informed that local foreign law prohibits.

§ 89.507-96 Sample selection.

(a) Engines comprising a test sample will be selected at the location and in the manner specified in the test order. If a manufacturer determines that the test engines cannot be selected in the manner specified in the test order, an alternative selection procedure may be employed, provided the manufacturer requests approval of the alternative procedure prior to the start of test sample selection, and the Administrator approves the procedure.

(b) The manufacturer must assemble the test engines of the family selected for testing using its normal mass production process for engines to be distributed into commerce. If, between the time the manufacturer is notified of a test order and the time the manufacturer finishes selecting test engines, the manufacturer implements any change(s) in its production processes, including quality control, which may reasonably be expected to affect the emissions of the engines selected, then the manufacturer must, during the audit, inform the Administrator of such changes. If the test engines are selected at a location where they do not have their operational and emission control systems installed, the test order will specify the manner and location for selection of components to complete assembly of the engines. The manufacturer must assemble these components onto the test engines using normal assembly and quality control procedures as documented by the manufacturer.

(c) No quality control, testing, or assembly procedures will be used on the test engine or any portion thereof, including parts and subassemblies, that have not been or will not be used during the production and assembly of all other engines of that family, unless the Administrator approves the modification in assembly procedures pursuant to paragraph (b) of this section.

(d) The test order may specify that an EPA enforcement officer(s) or authorized representative(s), rather than the manufacturer, select the test engines according to the method specified in the test order.

(e) The order in which test engines are selected determines the order in which test results are to be used in applying the sampling plan in accordance with § 89.510-96.

(f) The manufacturer must keep on hand all untested engines, if any, comprising the test sample until a pass or fail decision is reached in accordance with § 89.510-96(e). The manufacturer may ship any tested engine which has not failed the requirements as set forth in § 89.510-96(b). However, once the manufacturer ships any test engine, it relinquishes the prerogative to conduct retests as provided in § 89.508-96(i).

§ 89.508-96 Test procedures.

(a)(1) For nonroad engines subject to the provisions of this subpart, the prescribed test procedures are the nonroad engine 8-mode test procedure as described in subpart E of this part, the federal smoke test as described in part 86, subpart I of this chapter, and the particulate test procedure as adopted in the California Regulations for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines. This procedure is incorporated by reference. See § 89.6.

(2) The Administrator may, on the basis of a written application by a manufacturer, prescribe test procedures other than those specified in paragraph (a)(1) of this section for any nonroad engine he or she determines is not susceptible to satisfactory testing using the procedures specified in paragraph (a)(1) of this section.

(b)(1) The manufacturer may not adjust, repair, prepare, or modify the engines selected for testing and may not perform any emission tests on engines

selected for testing pursuant to the test order unless this adjustment, repair, preparation, modification, and/or tests are documented in the manufacturer's engine assembly and inspection procedures and are actually performed or unless these adjustments and/or tests are required or permitted under this subpart or are approved in advance by the Administrator.

(2) The Administrator may adjust or cause to be adjusted any engine parameter which the Administrator has determined to be subject to adjustment for certification and Selective Enforcement Audit testing in accordance with §89.108-96, to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with §89.108-96, prior to the performance of any tests. However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator may not adjust it to any setting which causes a lower engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter if the manufacturer had accumulated 125 hours of service on the engine under paragraph (c) of this section, all other parameters being identically adjusted for the purpose of the comparison. The manufacturer may be requested to supply information needed to establish an alternate minimum idle speed. The Administrator, in making or specifying these adjustments, may consider the effect of the deviation from the manufacturer's recommended setting on emission performance characteristics as well as the likelihood that similar settings will occur on in-use engines. In determining likelihood, the Administrator may consider factors such as, but not limited to, the effect of the adjustment on engine performance characteristics and surveillance information from similar in-use engines.

(c) *Service Accumulation.* Prior to performing exhaust emission testing on an SEA test engine, the manufacturer may accumulate on each engine a number of hours of service equal to the greater of 125 hours or the number of hours the manufacturer accumulated during certification on the emission

data engine corresponding to the family specified in the test order.

(1) Service accumulation must be performed in a manner using good engineering judgment to obtain emission results representative of normal production engines. This service accumulation must be consistent with the new engine break-in instructions contained in the applicable owner's manual.

(2) The manufacturer must accumulate service at a minimum rate of 16 hours per engine during each 24-hour period, unless otherwise approved by the Administrator.

(i) The first 24-hour period for service begins as soon as authorized checks, inspections, and preparations are completed on each engine.

(ii) The minimum service or mileage accumulation rate does not apply on weekends or holidays.

(iii) If the manufacturer's service or target is less than the minimum rate specified (16 hours per day), then the minimum daily accumulation rate is equal to the manufacturer's service target.

(3) Service accumulation must be completed on a sufficient number of test engines during consecutive 24-hour periods to assure that the number of engines tested per day fulfills the requirements of paragraphs (g)(1) and (g)(2) of this section.

(d) The manufacturer may not perform any maintenance on test engines after selection for testing, nor may the Administrator allow deletion of any engine from the test sequence, unless requested by the manufacturer and approved by the Administrator before any engine maintenance or deletion.

(e) The manufacturer must expeditiously ship test engines from the point of selection to the test facility. If the test facility is not located at or in close proximity to the point of selection, the manufacturer must assure that test engines arrive at the test facility within 24 hours of selection. The Administrator may approve more time for shipment based upon a request by the manufacturer accompanied by a satisfactory justification.

(f) If an engine cannot complete the service accumulation or an emission

test because of a malfunction, the manufacturer may request that the Administrator authorize either the repair of that engine or its deletion from the test sequence.

(g) Whenever a manufacturer conducts testing pursuant to a test order issued under this subpart, the manufacturer must notify the Administrator within one working day of receipt of the test order as to which test facility will be used to comply with the test order. If no test cells are available at a desired facility, the manufacturer must provide alternate testing capability satisfactory to the Administrator.

(1) A manufacturer with projected nonroad engine sales for the United States market for the applicable year of 7,500 or greater must complete emission testing at a minimum rate of two engines per 24-hour period, including each voided test and each smoke test.

(2) A manufacturer with projected nonroad engine sales for the United States market for the applicable year of less than 7,500 must complete emission testing at a minimum rate of one engine per 24-hour period, including each voided test and each smoke test.

(3) The Administrator may approve a lower daily rate of emission testing based upon a request by a manufacturer accompanied by a satisfactory justification.

(h) The manufacturer must perform test engine selection, shipping, preparation, service accumulation, and testing in such a manner as to assure that the audit is performed in an expeditious manner.

(i) *Retesting.* (1) The manufacturer may retest any engines tested during a Selective Enforcement Audit once a fail decision for the audit has been reached in accordance with § 89.510-96(e).

(2) The Administrator may approve retesting at other times based upon a request by the manufacturer accompanied by a satisfactory justification.

(3) The manufacturer may retest each engine a total of three times. The manufacturer must test each engine or vehicle the same number of times. The manufacturer may accumulate additional service before conducting a retest, subject to the provisions of paragraph (c) of this section.

(j) A manufacturer must test engines with the test procedure specified in subpart E of this part to demonstrate compliance with the exhaust emission standard (or applicable FEL) for oxides of nitrogen. If alternate procedures were used in certification pursuant to § 89.114-96, then those alternate procedures must be used.

§ 89.509-96 Calculation and reporting of test results.

(a) Initial test results are calculated following the applicable test procedure specified in paragraph (a) of § 89.508-96. The manufacturer rounds these results, in accordance with ASTM E29-90, to the number of decimal places contained in the applicable emission standard expressed to one additional significant figure. This procedure has been incorporated by reference. See § 89.6.

(b) Final test results are calculated by summing the initial test results derived in paragraph (a) of this section for each test engine, dividing by the number of tests conducted on the engine, and rounding in accordance with ASTM E29-90 to the same number of decimal places contained in the applicable standard expressed to one additional significant figure.

(c) Within five working days after completion of testing of all engines pursuant to a test order, the manufacturer must submit to the Administrator a report which includes the following information:

(1) The location and description of the manufacturer's exhaust emission test facilities which were utilized to conduct testing reported pursuant to this section;

(2) The applicable standards and/or FEL against which the engines were tested;

(3) A description of the engine and its associated emission-related component selection method used;

(4) For each test conducted;

(i) Test engine description, including:

(A) Configuration and engine family identification;

(B) Year, make, and build date;

(C) Engine identification number; and

(D) Number of hours of service accumulated on engine prior to testing;

(ii) Location where service accumulation was conducted and description of accumulation procedure and schedule;

(iii) Test number, date, test procedure used, initial test results before and after rounding, and final test results for all exhaust emission tests, whether valid or invalid, and the reason for invalidation, if applicable;

(iv) A complete description of any modification, repair, preparation, maintenance, and/or testing which was performed on the test engine and has not been reported pursuant to any other paragraph of this subpart and will not be performed on all other production engines;

(v) Where an engine was deleted from the test sequence by authorization of the Administrator, the reason for the deletion;

(vi) Any other information the Administrator may request relevant to the determination as to whether the new engines being manufactured by the manufacturer do in fact conform with the regulations with respect to which the certificate of conformity was issued; and

(5) The following statement and endorsement:

This report is submitted pursuant to sections 213 and 208 of the Clean Air Act. This Selective Enforcement Audit was conducted in complete conformance with all applicable regulations under 40 CFR part 89 *et seq.* and the conditions of the test order. No emission-related changes to production processes or quality control procedures for the engine family tested have been made between receipt of the test order and conclusion of the audit. All data and information reported herein is, to the best of (Company Name) knowledge, true and accurate. I am aware of the penalties associated with violations of the Clean Air Act and the regulations thereunder. (Authorized Company Representative.)

§89.510-96 Compliance with acceptable quality level and passing and failing criteria for selective enforcement audits.

(a) The prescribed acceptable quality level is 40 percent.

(b) A failed engine is one whose final test results pursuant to §89.509-96(b), for one or more of the applicable pollutants, exceed the applicable emission standard or family emission level.

(c) The manufacturer must test engines comprising the test sample until a pass decision is reached for all pollutants or a fail decision is reached for one pollutant. A pass decision is reached when the cumulative number of failed engines, as defined in paragraph (b) of this section, for each pollutant is less than or equal to the pass decision number, as defined in paragraph (d) of this section, appropriate to the cumulative number of engines tested. A fail decision is reached when the cumulative number of failed engines for one or more pollutants is greater than or equal to the fail decision number, as defined in paragraph (d) of this section, appropriate to the cumulative number of engines tested.

(d) The pass and fail decision numbers associated with the cumulative number of engines tested are determined by using the tables in appendix A to this subpart, "Sampling Plans for Selective Enforcement Auditing of Nonroad Engines," appropriate to the projected sales as made by the manufacturer in its report to EPA under §89.505-96(c)(1). In the tables in appendix A to this subpart, sampling plan "stage" refers to the cumulative number of engines tested. Once a pass or fail decision has been made for a particular pollutant, the number of engines with final test results exceeding the emission standard for that pollutant shall not be considered any further for the purposes of the audit.

(e) Passing or failing of an SEA occurs when the decision is made on the last engine required to make a decision under paragraph (c) of this section.

(f) The Administrator may terminate testing earlier than required in paragraph (c) of this section.

§89.511-96 Suspension and revocation of certificates of conformity.

(a) The certificate of conformity is suspended with respect to any engine failing pursuant to paragraph (b) of §89.510-96 effective from the time that testing of that engine is completed.

(b) The Administrator may suspend the certificate of conformity for a family which does not pass an SEA, pursuant to paragraph §89.510-96(c), based on the first test or all tests conducted on each engine. This suspension will not

occur before ten days after failure of the audit, unless the manufacturer requests an earlier suspension.

(c) If the results of testing pursuant to these regulations indicate that engines of a particular family produced at one plant of a manufacturer do not conform to the regulations with respect to which the certificate of conformity was issued, the Administrator may suspend the certificate of conformity with respect to that family for engines manufactured by the manufacturer at all other plants.

(d) Notwithstanding the fact that engines described in the application may be covered by a certificate of conformity, the Administrator may suspend such certificate immediately in whole or in part if the Administrator finds any one of the following infractions to be substantial:

(1) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator under § 89.503-96.

(2) The manufacturer refuses to comply with any of the requirements of this subpart.

(3) The manufacturer submits false or incomplete information in any report or information provided to the Administrator under this subpart.

(4) The manufacturer renders inaccurate any test data submitted under this subpart.

(5) An EPA enforcement officer(s) or EPA authorized representative(s) is denied the opportunity to conduct activities related to entry and access as authorized in this subpart and a warrant or court order is presented to the manufacturer or the party in charge of a facility in question.

(6) An EPA enforcement officer(s) or EPA authorized representative(s) is unable to conduct activities related to entry and access as authorized in § 89.506-96 because a manufacturer has located a facility in a foreign jurisdiction where local law prohibits those activities.

(e) The Administrator must notify the manufacturer in writing of any suspension or revocation of a certificate of conformity in whole or in part; a suspension or revocation is effective upon receipt of the notification or ten days, except that the certificate is imme-

diately suspended with respect to any failed engines as provided for in paragraph (a) of this section.

(f) The Administrator may revoke a certificate of conformity for a family when the certificate has been suspended pursuant to paragraph (b) or (c) of this section if the proposed remedy for the nonconformity, as reported by the manufacturer to the Administrator, is one requiring a design change or changes to the engine and/or emission control system as described in the application for certification of the affected family.

(g) Once a certificate has been suspended for a failed engine, as provided for in paragraph (a) of this section, the manufacturer must take the following actions before the certificate is reinstated for that failed engine:

(1) Remedy the nonconformity.

(2) Demonstrate that the engine conforms to applicable standards or family emission levels by retesting the engine in accordance with these regulations.

(3) Submit a written report to the Administrator, after successful completion of testing on the failed engine, which contains a description of the remedy and test results for each engine in addition to other information that may be required by this part.

(h) Once a certificate for a failed family has been suspended pursuant to paragraph (b) or (c) of this section, the manufacturer must take the following actions before the Administrator will consider reinstating the certificate:

(1) Submit a written report to the Administrator which identifies the reason for the noncompliance of the engines, describes the proposed remedy, including a description of any proposed quality control and/or quality assurance measures to be taken by the manufacturer to prevent future occurrences of the problem, and states the date on which the remedies will be implemented.

(2) Demonstrate that the engine family for which the certificate of conformity has been suspended does in fact comply with these regulations by testing engines selected from normal production runs of that engine family, at the plant(s), port facility(ies) or associated storage facility(ies) specified by the Administrator, in accordance with

the conditions specified in the initial test order. If the manufacturer elects to continue testing individual engines after suspension of a certificate, the certificate is reinstated for an engine actually determined to be in conformance with the applicable standards or family emission levels through testing in accordance with the applicable test procedures, provided that the Administrator has not revoked the certificate pursuant to paragraph (f) of this section.

(i) Once the certificate for a family has been revoked under paragraph (f) of this section and the manufacturer desires to continue introduction into commerce of a modified version of that family, the following actions must be taken before the Administrator may consider issuing a certificate for that modified family:

(1) If the Administrator determines that the proposed change(s) in engine design may have an effect on emission performance deterioration, the Administrator will notify the manufacturer, within five working days after receipt of the report in paragraph (g) of this section, whether subsequent testing under this subpart is sufficient to evaluate the proposed change or changes or whether additional testing is required; and

(2) After implementing the change or changes intended to remedy the non-conformity, the manufacturer must demonstrate that the modified engine family does in fact conform with these regulations by testing engines selected from normal production runs of that modified engine family in accordance with the conditions specified in the initial test order. If the subsequent audit results in passing of the audit, the Administrator will reissue the certificate or issue a new certificate, as the case may be, to include that family, provided that the manufacturer has satisfied the testing requirements of paragraph (i)(1) of this section. If the subsequent audit is failed, the revocation remains in effect. Any design change approvals under this subpart are limited to the family affected by the test order.

(j) At any time subsequent to an initial suspension of a certificate of conformity for a test engine pursuant to

paragraph (a) of this section, but not later than 15 days (or such other period as may be allowed by the Administrator) after notification of the Administrator's decision to suspend or revoke a certificate of conformity in whole or in part pursuant to paragraph (b), (c), or (f) of this section, a manufacturer may request a hearing as to whether the tests have been properly conducted or any sampling methods have been properly applied.

(k) Any suspension of a certificate of conformity under paragraph (d) of this section:

(1) will be in writing and will include the offer of an opportunity for a hearing conducted in accordance with §§ 89.512-96, 89.513-96, and 89.514-96 and

(2) need not apply to engines no longer in the hands of the manufacturer.

(l) After the Administrator suspends or revokes a certificate of conformity pursuant to this section and prior to the commencement of a hearing under § 89.512-96, if the manufacturer demonstrates to the Administrator's satisfaction that the decision to suspend, revoke, or void the certificate was based on erroneous information, the Administrator will reinstate the certificate.

(m) To permit a manufacturer to avoid storing non-test engines when conducting an audit of a family subsequent to a failure of an SEA and while reauditing of the failed family, it may request that the Administrator conditionally reinstate the certificate for that family. The Administrator may reinstate the certificate subject to the condition that the manufacturer consents to recall all engines of that family produced from the time the certificate is conditionally reinstated if the family fails the subsequent audit at the level of the standard and to remedy any nonconformity at no expense to the owner.

§ 89.512-96 Request for public hearing.

(a) If the manufacturer disagrees with the Administrator's decision under § 89.511-96 (b), (c), (d), or (f) to suspend or revoke a certificate or disputes the basis for an automatic suspension pursuant to § 89.511-96 (a), the

manufacturer may request a public hearing.

(b) The manufacturer's request must be filed with the Administrator not later than 15 days after the Administrator's notification of the decision to suspend or revoke, unless otherwise specified by the Administrator. The manufacturer must simultaneously serve two copies of this request upon the Director of the Manufacturers Operations Division and file two copies with the Hearing Clerk of the Agency. Failure of the manufacturer to request a hearing within the time provided constitutes a waiver of the right to a hearing. Subsequent to the expiration of the period for requesting a hearing as of right, the Administrator may, at her or his discretion and for good cause shown, grant the manufacturer a hearing to contest the suspension or revocation.

(c) The manufacturer's request for a public hearing must include:

(1) A statement as to which engine configuration(s) within a family is to be the subject of the hearing;

(2) A concise statement of the issues to be raised by the manufacturer at the hearing, except that in the case of the hearing requested under § 89.511-96(j), the hearing is restricted to the following issues:

(i) Whether tests have been properly conducted, specifically, whether the tests were conducted in accordance with applicable regulations under this part and whether test equipment was properly calibrated and functioning;

(ii) Whether sampling plans have been properly applied, specifically, whether sampling procedures specified in appendix A of this subpart were followed and whether there exists a basis for distinguishing engines produced at plants other than the one from which engines were selected for testing which would invalidate the Administrator's decision under § 89.511-96(c);

(3) A statement specifying reasons why the manufacturer believes it will prevail on the merits of each of the issues raised; and

(4) A summary of the evidence which supports the manufacturer's position on each of the issues raised.

(d) A copy of all requests for public hearings will be kept on file in the Of-

fice of the Hearing Clerk and will be made available to the public during Agency business hours.

§ 89.513-96 Administrative procedures for public hearing.

(a) The Presiding Officer is an Administrative Law Judge appointed pursuant to 5 U.S.C. 3105 (see also 5 CFR part 930 as amended).

(b) The Judicial Officer is an officer or employee of the Agency appointed as a Judicial Officer by the Administrator, pursuant to this section, who meets the qualifications and performs functions as follows:

(1) *Qualifications.* A Judicial Officer may be a permanent or temporary employee of the Agency who performs other duties for the Agency. The Judicial Officer may not be employed by the Office of Enforcement or have any connection with the preparation or presentation of evidence for a hearing held pursuant to this subpart. The Judicial Officer must be a graduate of an accredited law school and a member in good standing of a recognized Bar Association of any state or the District of Columbia.

(2) *Functions.* The Administrator may consult with the Judicial Officer or delegate all or part of the Administrator's authority to act in a given case under this section to a Judicial Officer, provided that this delegation does not preclude the Judicial Officer from referring any motion or case to the Administrator when the Judicial Officer determines such referral to be appropriate.

(c) For the purposes of this section, one or more Judicial Officers may be designated. As work requires, a Judicial Officer may be designated to act for the purposes of a particular case.

(d) *Summary decision.* (1) In the case of a hearing requested under § 89.511-96(j), when it clearly appears from the data and other information contained in the request for a hearing that no genuine and substantial question of fact or law exists with respect to the issues specified in § 89.512-96(c)(2), the Administrator may enter an order denying the request for a hearing and reaffirming the original decision to suspend or revoke a certificate of conformity.

(2) In the case of a hearing requested under § 89.512-96 to challenge a suspension of a certificate of conformity for the reasons specified in § 89.511-96(d), when it clearly appears from the data and other information contained in the request for the hearing that no genuine and substantial question of fact or law exists with respect to the issue of whether the refusal to comply with the provisions of a test order or any other requirement of § 89.503-96 was caused by conditions and circumstances outside the control of the manufacturer, the Administrator may enter an order denying the request for a hearing and suspending the certificate of conformity.

(3) Any order issued under paragraph (d)(1) or (d)(2) of this section has the force and effect of a final decision of the Administrator, as issued pursuant to § 89.515-96.

(4) If the Administrator determines that a genuine and substantial question of fact or law does exist with respect to any of the issues referred to in paragraphs (d)(1) and (d)(2) of this section, the Administrator will grant the request for a hearing and publish a notice of public hearing in the FEDERAL REGISTER or by such other means as the Administrator finds appropriate to provide notice to the public.

(e) *Filing and service.* (1) An original and two copies of all documents or papers required or permitted to be filed pursuant to this section and § 89.512-96(c) must be filed with the Hearing Clerk of the Agency. Filing is considered timely if mailed, as determined by the postmark, to the Hearing Clerk within the time allowed by this section and § 89.512-96(b). If filing is to be accomplished by mailing, the documents must be sent to the address set forth in the notice of public hearing referred to in paragraph (d)(4) of this section.

(2) To the maximum extent possible, testimony will be presented in written form. Copies of written testimony will be served upon all parties as soon as practicable prior to the start of the hearing. A certificate of service will be provided on or accompany each document or paper filed with the Hearing Clerk. Documents to be served upon the Director of the Manufacturers Operations Division must be sent by reg-

istered mail to: Director, Manufacturers Operations Division, U.S. Environmental Protection Agency, 6405-J, 401 M Street SW, Washington, DC 20460. Service by registered mail is complete upon mailing.

(f) *Computation of time.* (1) In computing any period of time prescribed or allowed by this section, except as otherwise provided, the day of the act or event from which the designated period of time begins to run is not included. Saturdays, Sundays, and federal legal holidays are included in computing the period allowed for the filing of any document or paper, except that when the period expires on a Saturday, Sunday, or federal legal holiday, the period is extended to include the next following business day.

(2) A prescribed period of time within which a party is required or permitted to do an act is computed from the time of service, except that when service is accomplished by mail, three days will be added to the prescribed period.

(g) *Consolidation.* The Administrator or the Presiding Officer in his discretion may consolidate two or more proceedings to be held under this section for the purpose of resolving one or more issues whenever it appears that consolidation will expedite or simplify consideration of these issues. Consolidation does not affect the right of any party to raise issues that could have been raised if consolidation had not occurred.

(h) *Hearing date.* To the extent possible hearings under § 89.512-96 will be scheduled to commence within 14 days of receipt of the application in § 89.512-96.

§ 89.514-96 Hearing procedures.

The procedures provided in § 86.1014-84 (i) to (s) apply for hearings requested pursuant to § 89.512-96, suspension, revocation, or voiding of a certificate of conformity.

§ 89.515-96 Appeal of hearing decision.

The procedures provided in § 86.1014-84 (t) to (aa) apply for appeals filed with respect to hearings held pursuant to § 89.514-96.

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§ 89.516-96 Treatment of confidential information.

The provisions for treatment of confidential information as described in § 89.7 apply.

APPENDIX A TO SUBPART F—SAMPLING PLANS FOR SELECTIVE ENFORCEMENT AUDITING OF NONROAD ENGINES

TABLE 1.—SAMPLING PLAN CODE LETTER

| Annual engine family sales | Code letter |
|----------------------------|-----------------|
| 20-50 | AA ¹ |
| 20-99 | A |
| 100-299 | B |
| 300-299 | C |
| 500 or greater | D |

¹A manufacturer may optionally use either the sampling plan for code letter "AA" or sampling plan for code letter "A" for Selective Enforcement Audits of engine families with annual sales between 20 and 50 engines. Additionally, the manufacturer may switch between these plans during the audit.

TABLE 2.—SAMPLING PLAN FOR CODE LETTER

"AA##"
[Sample inspection criteria]

| Stage | Pass No. | Fail No. |
|----------|------------------|------------------|
| 1 | (¹) | (²) |
| 2 | (¹) | (²) |
| 3 | 0 | (²) |
| 4 | 0 | (²) |
| 5 | 1 | 5 |
| 6 | 1 | 6 |
| 7 | 2 | 6 |
| 8 | 2 | 7 |
| 9 | 3 | 7 |
| 10 | 3 | 8 |
| 11 | 4 | 8 |
| 12 | 4 | 9 |
| 13 | 5 | 9 |
| 14 | 5 | 10 |
| 15 | 6 | 10 |
| 16 | 6 | 10 |
| 17 | 7 | 10 |
| 18 | 8 | 10 |
| 19 | 8 | 10 |
| 20 | 9 | 10 |

¹Test sample passing not permitted at this stage.
²Test sample failure not permitted at this stage.

TABLE 3.—SAMPLING PLAN FOR CODE LETTER

"A##"
[Sample inspection criteria]

| Stage | Pass No. | Fail No. |
|----------|------------------|------------------|
| 1 | (¹) | (²) |
| 2 | (¹) | (²) |
| 3 | (¹) | (²) |
| 4 | 0 | (²) |
| 5 | 0 | (²) |
| 6 | 1 | 6 |
| 7 | 1 | 7 |
| 8 | 2 | 7 |
| 9 | 2 | 8 |
| 10 | 3 | 8 |
| 11 | 3 | 8 |

TABLE 3.—SAMPLING PLAN FOR CODE LETTER

"A##"—Continued
[Sample inspection criteria]

| Stage | Pass No. | Fail No. |
|----------|----------|----------|
| 12 | 4 | 9 |
| 13 | 5 | 10 |
| 14 | 5 | 10 |
| 15 | 6 | 11 |
| 16 | 6 | 11 |
| 17 | 7 | 12 |
| 18 | 7 | 12 |
| 19 | 8 | 13 |
| 20 | 8 | 13 |
| 21 | 9 | 14 |
| 22 | 10 | 14 |
| 23 | 10 | 15 |
| 24 | 11 | 15 |
| 25 | 11 | 16 |
| 26 | 12 | 16 |
| 27 | 12 | 17 |
| 28 | 13 | 17 |
| 29 | 14 | 17 |
| 30 | 16 | 17 |

¹Test sample passing not permitted at this stage.
²Test sample failure not permitted at this stage.

TABLE 4.—SAMPLING PLAN FOR CODE LETTER

"B##"
[Sample Inspection Criteria]

| Stage | Pass No. | Fail No. |
|----------|------------------|------------------|
| 1 | (¹) | (²) |
| 2 | (¹) | (²) |
| 3 | (¹) | (²) |
| 4 | (¹) | (²) |
| 5 | 0 | (²) |
| 6 | 1 | 6 |
| 7 | 1 | 7 |
| 8 | 2 | 7 |
| 9 | 2 | 8 |
| 10 | 3 | 8 |
| 11 | 3 | 9 |
| 12 | 4 | 9 |
| 13 | 4 | 10 |
| 14 | 5 | 10 |
| 15 | 5 | 11 |
| 16 | 6 | 12 |
| 17 | 6 | 12 |
| 18 | 7 | 13 |
| 19 | 8 | 13 |
| 20 | 8 | 14 |
| 21 | 9 | 14 |
| 22 | 9 | 15 |
| 23 | 10 | 15 |
| 24 | 10 | 16 |
| 25 | 11 | 16 |
| 26 | 11 | 17 |
| 27 | 12 | 17 |
| 28 | 12 | 18 |
| 29 | 13 | 18 |
| 30 | 13 | 19 |
| 31 | 14 | 19 |
| 32 | 14 | 20 |
| 33 | 15 | 20 |
| 34 | 16 | 21 |
| 35 | 16 | 21 |
| 36 | 17 | 22 |
| 37 | 17 | 22 |
| 38 | 18 | 22 |
| 39 | 18 | 22 |
| 40 | 21 | 22 |

¹Test sample passing not permitted at this stage.

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²Test sample failure not permitted at this stage.

TABLE 5.—SAMPLING PLAN FOR CODE LETTER
“C”
[Sample Inspection Criteria]

| Stage | Pass No. | Fail No. |
|-------|----------|----------|
| 1 | (1) | (2) |
| 2 | (1) | (2) |
| 3 | (1) | (2) |
| 4 | (1) | (2) |
| 5 | 0 | (2) |
| 6 | 0 | 6 |
| 7 | 1 | 7 |
| 8 | 2 | 7 |
| 9 | 2 | 8 |
| 10 | 3 | 9 |
| 11 | 3 | 9 |
| 12 | 4 | 10 |
| 13 | 4 | 10 |
| 14 | 5 | 11 |
| 15 | 5 | 11 |
| 16 | 6 | 12 |
| 17 | 6 | 12 |
| 18 | 7 | 13 |
| 19 | 7 | 13 |
| 20 | 8 | 14 |
| 21 | 8 | 14 |
| 22 | 9 | 15 |
| 23 | 10 | 15 |
| 24 | 10 | 16 |
| 25 | 11 | 16 |
| 26 | 11 | 17 |
| 27 | 12 | 17 |
| 28 | 12 | 18 |
| 29 | 13 | 18 |
| 30 | 13 | 19 |
| 31 | 14 | 19 |
| 32 | 14 | 20 |
| 33 | 15 | 20 |
| 34 | 15 | 21 |
| 35 | 16 | 21 |
| 36 | 16 | 22 |
| 37 | 17 | 22 |
| 38 | 18 | 23 |
| 39 | 18 | 23 |
| 40 | 19 | 24 |
| 41 | 19 | 24 |
| 42 | 20 | 25 |
| 43 | 20 | 25 |
| 44 | 21 | 26 |
| 45 | 21 | 27 |
| 46 | 22 | 27 |
| 47 | 22 | 27 |
| 48 | 23 | 27 |
| 49 | 23 | 27 |
| 50 | 26 | 27 |

¹Test sample passing not permitted at this stage.
²Test sample failure not permitted at this stage.

TABLE 6.—SAMPLING PLAN FOR CODE LETTER
“D”
[Sample Inspection Criteria]

| Stage | Pass No. | Fail No. |
|-------|----------|----------|
| 1 | (1) | (2) |
| 2 | (1) | (2) |
| 3 | (1) | (2) |
| 4 | (1) | (2) |
| 5 | 0 | (2) |
| 6 | 0 | 6 |
| 7 | 1 | 7 |

TABLE 6.—SAMPLING PLAN FOR CODE LETTER
“D”
[Sample Inspection Criteria]

| Stage | Pass No. | Fail No. |
|-------|----------|----------|
| 8 | 2 | 8 |
| 9 | 2 | 8 |
| 10 | 3 | 9 |
| 11 | 3 | 9 |
| 12 | 4 | 10 |
| 13 | 4 | 10 |
| 14 | 5 | 11 |
| 15 | 5 | 11 |
| 16 | 6 | 12 |
| 17 | 6 | 12 |
| 18 | 7 | 13 |
| 19 | 7 | 13 |
| 20 | 8 | 14 |
| 21 | 8 | 14 |
| 22 | 9 | 15 |
| 23 | 9 | 15 |
| 24 | 10 | 16 |
| 25 | 11 | 16 |
| 26 | 11 | 17 |
| 27 | 12 | 17 |
| 28 | 12 | 18 |
| 29 | 13 | 19 |
| 30 | 13 | 19 |
| 31 | 14 | 20 |
| 32 | 14 | 20 |
| 33 | 15 | 21 |
| 34 | 15 | 21 |
| 35 | 16 | 22 |
| 36 | 16 | 22 |
| 37 | 17 | 23 |
| 38 | 17 | 23 |
| 39 | 18 | 24 |
| 40 | 18 | 24 |
| 41 | 19 | 25 |
| 42 | 19 | 26 |
| 43 | 20 | 26 |
| 44 | 21 | 27 |
| 45 | 21 | 27 |
| 46 | 22 | 28 |
| 47 | 22 | 28 |
| 48 | 23 | 29 |
| 49 | 23 | 29 |
| 50 | 24 | 30 |
| 51 | 24 | 30 |
| 52 | 25 | 31 |
| 53 | 25 | 31 |
| 54 | 26 | 32 |
| 55 | 26 | 32 |
| 56 | 27 | 33 |
| 57 | 27 | 33 |
| 58 | 28 | 33 |
| 59 | 28 | 33 |
| 60 | 32 | 33 |

¹Test sample passing not permitted at this stage.
²Test sample failure not permitted at this stage.

Subpart G—Importation of Nonconforming Nonroad Engines

§ 89.601-96 Applicability.

(a) Except where otherwise indicated, this subpart is applicable to nonroad engines for which the Administrator has promulgated regulations under this part prescribing emission standards and nonroad vehicles and equipment

containing such nonroad engines that are offered for importation or imported into the United States, but which engines, at the time of conditional importation, are not covered by certificates of conformity issued under section 213 and section 206(a) of the Clean Air Act as amended (that is, which are nonconforming nonroad engines as defined in § 89.602-96), and this part. Compliance with regulations under this subpart does not relieve any person or entity from compliance with other applicable provisions of the Clean Air Act.

(b) Regulations prescribing further procedures for the importation of nonroad engines and nonroad vehicles and equipment into the customs territory of the United States, as defined in 19 U.S.C. 1202, are set forth in U.S. Bureau of Customs regulations.

(c) For the purposes of this subpart, the term "nonroad engine" includes all nonroad engines incorporated into nonroad equipment or nonroad vehicles at the time they are imported or offered for import into the United States.

§ 89.602-96 Definitions.

The definitions in subpart A of this part apply to this subpart. The following definitions also apply to this subpart.

Certificate of conformity. The document issued by the Administrator under section 213 and section 206(a) of the Act.

Currently valid certificate of conformity. A certificate of conformity for which the current date is within the effective period as specified on the certificate of conformity, and which has not been withdrawn, superseded, voided, suspended, revoked, or otherwise rendered invalid.

Fifteen working day hold period. The period of time between a request for final admission and the automatic granting of final admission (unless EPA intervenes) for a nonconforming nonroad engine conditionally imported pursuant to § 89.605-96 or § 89.609-96. Day one of the hold period is the first working day (see definition below) after the Manufacturers Operations Division of EPA receives a complete and valid application for final admission.

Independent commercial importer (ICI). An importer who is not an original en-

gine manufacturer (OEM) (see definition below), but is the entity in whose name a certificate of conformity for a class of nonroad engines has been issued.

Model year for imported engines. The manufacturer's annual production period (as determined by the Administrator) which includes January 1 of the calendar year; provided, that if the manufacturer has no annual production period, the term "model year" means the calendar year in which a nonroad engine is modified. An independent commercial importer (ICI) is deemed to have produced a nonroad engine when the ICI has modified (including labeling) the nonconforming nonroad engine to meet applicable emission requirements.

Nonconforming nonroad engine. A nonroad engine which is not covered by a certificate of conformity prior to final or conditional admission (or for which such coverage has not been adequately demonstrated to EPA) and which has not been finally admitted into the United States under the provisions of § 89.605-96 or § 89.609-96.

Original engine manufacturer (OEM). The entity which originally manufactured the nonroad engine.

Original production (OP) year. The calendar year in which the nonroad engine was originally produced by the OEM.

Original production (OP) years old. The age of a nonroad engine as determined by subtracting the original production year of the nonroad engine from the calendar year of importation.

Production changes. Those changes in nonroad engine configuration, equipment, or calibration which are made by an OEM or ICI in the course of nonroad engine production and required to be reported under § 89.123-96.

United States. United States includes the customs territory of the United States as defined in 19 U.S.C. 1202, and the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

Useful life. A period of time as specified in subpart B of this part which for a nonconforming nonroad engine begins at the time of resale (for a nonroad engine owned by the ICI at the time of importation) or release to the owner (for a nonroad engine not owned

by the ICI at the time of importation) of the nonroad engine by the ICI after modification and/or testing pursuant to § 89.605-96 or § 89.609-96.

Working day. Any day on which federal government offices are open for normal business. Saturdays, Sundays, and official federal holidays are not working days.

§ 89.603-96 General requirements for importation of nonconforming nonroad engines.

(a) A nonconforming nonroad engine offered for importation into the United States is to be imported only by an Independent Commercial Importer (ICI) who is a holder of a currently valid certificate of conformity unless an exemption or exclusion is granted by the Administrator under § 89.611-96 of this subpart. For a nonroad engine imported pursuant to § 89.605-96, the ICI must hold a currently valid certificate of conformity for that specific nonroad engine model.

(b) Any nonroad engine imported into the United States must have a legible unique engine identification number permanently affixed to or engraved on the engine.

(c) Final admission may not be granted unless:

(1) The nonroad engine is covered by a certificate of conformity issued under subpart B of this part in the name of the ICI and the ICI has complied with all requirements of § 89.605-96; or

(2) The nonroad engine is modified and emission tested in accordance with the provisions of § 89.609-96 and the ICI has complied with all other requirements of § 89.609-96; or

(3) The nonroad engine is exempted or excluded under § 89.611-96.

(d) The ICI must submit to the Manufacturers Operations Division of EPA a copy of all approved applications for certification used to obtain certificates of conformity for the purpose of importing nonconforming nonroad engines pursuant to § 89.605-96 or § 89.609-96. In addition, the ICI must submit to the Manufacturers Operations Division a copy of all approved production changes implemented pursuant to § 89.605-96 or subpart B of this part. Documentation submitted pursuant to

this paragraph must be provided to the Manufacturers Operations Division within 10 working days of approval of the certification application (or production change) by the Certification Division of EPA.

§ 89.604-96 Conditional admission.

(a) A nonroad engine offered for importation under § 89.605-96 or § 89.609-96 may be conditionally admitted into the United States. These engines are refused final admission, unless at the time of conditional admission the importer has submitted to the Administrator a written report that the subject nonroad engine has been permitted conditional admission pending EPA approval of its application for final admission under § 89.605-96 or § 89.609-96. This written report is to contain the following:

(1) Identification of the importer of the nonroad engine and the importer's address, telephone number, and taxpayer identification number;

(2) Identification of the nonroad engine owner, the owner's address, telephone number, and taxpayer identification number;

(3) Identification of the nonroad engine including make, model, identification number, and original production year;

(4) Information indicating under what provision of these regulations the nonroad engine is to be imported;

(5) Identification of the place where the subject nonroad engine is to be stored until EPA approval of the importer's application to the Administrator for final admission;

(6) Authorization for EPA enforcement officers to conduct inspections or testing otherwise permitted by the Act or regulations thereunder;

(7) Identification of the Independent Commercial Importer's (ICI) certificate of conformity that permits the ICI to import that nonroad engine (for importation under § 89.605-96 or § 89.609-96); and

(8) Such other information as is deemed necessary by the Administrator.

(b) EPA will not require a U.S. Customs Service bond for a nonconforming nonroad engine which is imported

under § 89.605-96 or § 89.609-96. The period of conditional admission may not exceed 120 days. Nonroad engines imported under § 89.605-96 or § 89.609-96 may not be operated during the period of conditional admission except for that operation necessary to comply with the requirements of this subpart. During the period of conditional admission applicable to § 89.605-96 or § 89.609-96, the importer must store the nonroad engine at a location where the Administrator has reasonable access to the nonroad engine for inspection.

(c) During the period of conditional admission under § 89.605-96 or § 89.609-96, an ICI may transfer responsibility of a nonroad engine to another qualified ICI for the purposes of complying with this subpart.

(1) The transferee ICI must be a holder of a currently valid certificate of conformity for the specific nonroad engine being transferred or be authorized to import the nonroad engine pursuant to § 89.609-96 as of the transfer date. The transferee ICI must comply with all the requirements of § 89.603-96, § 89.604-96, and either § 89.605-96 or § 89.609-96, as applicable.

(2) For the purpose of this subpart, the transferee ICI has "imported" the nonroad engine as of the transfer date as designated in a written record that is signed by both ICIs.

(3) The ICI that originally imported the nonroad engine is responsible for all requirements of this subpart from the actual date of importation until the date of transfer as designated in the written record. The transferee ICI is responsible for all requirements of this subpart beginning on the date of transfer.

(4) A copy of the written record is to be submitted to the Manufacturers Operations Division of EPA within five working days of the transfer date.

(d) Notwithstanding any other requirement of this subpart or U.S. Customs Service regulations, an ICI may also assume responsibility for the modification and testing of a nonconforming nonroad engine which was previously imported by another party. The ICI must be a holder of a currently valid certificate of conformity for that specific nonroad engine or authorized to import it pursuant to § 89.609-96 at

the time of assuming such responsibility. The ICI must comply with all the requirements of § 89.603-96, § 89.604-96, and either § 89.605-96 or § 89.609-96, as applicable. For the purposes of this subpart, the ICI has "imported" the nonroad engine as of the date the ICI assumes responsibility for the modification and testing of the nonroad engine. The ICI must submit written notification to the Manufacturers Operations Division of EPA within 10 working days of the assumption of that responsibility.

§ 89.605-96 Final admission of certified nonroad engines.

(a) A nonroad engine may be finally admitted into the United States upon approval of the ICI's application to the Administrator. The application is made by completing EPA forms in accordance with EPA instructions. The application contains:

(1) The information required in § 89.604-96(a);

(2) Information demonstrating that the nonroad engine has been modified in accordance with a valid certificate of conformity. Demonstration is made in one of the following ways:

(i) The ICI attests that the nonroad engine has been modified in accordance with the provisions of the ICI's certificate of conformity; presents to EPA a statement written by the applicable Original Engine Manufacturer (OEM) that the OEM must provide to the ICI, and to EPA, information concerning production changes to the class of nonroad engines described in the ICI's application for certification; delivers to the Manufacturers Operations Division of EPA notification by the ICI of any production changes already implemented by the OEM at the time of application and their effect on emissions; and obtains from EPA written approval to use this demonstration option; or

(ii) The ICI attests that the nonroad engine has been modified in accordance with the provisions of the ICI's certificate of conformity. The ICI also attests that it has conducted, within 120 days of entry, an applicable and valid emission test on every third nonroad engine imported under that certificate of conformity to demonstrate compliance with federal emission requirements.

The test is to be conducted at a laboratory located within the United States. Sequencing of the tests is determined by the date of importation of each nonroad engine beginning with the prototype nonroad engine used to obtain the applicable certificate of conformity. Should the ICI exceed a threshold of 300 nonroad engines imported under the certificate of conformity without adjustments or other changes in accordance with paragraph (a)(3) of this section, the amount of required testing is reduced to every fifth nonroad engine.

(3) The results of every emission test which the ICI conducted on the nonroad engine pursuant to paragraph (a)(2)(ii) of this section. Should a subject nonroad engine fail an emission test at any time, the following procedures are applicable:

(i) The ICI may either:

(A) Conduct one retest that involves no adjustment of the nonroad engine from the previous test (for example, adjusting the RPM, timing, air-to-fuel ratio, and so forth) other than adjustments to adjustable parameters that, upon inspection, were found to be out of tolerance. When such an allowable adjustment is made, the parameter may be reset only to the specified (that is, nominal) value (and not any other value within the tolerance band); or

(B) Initiate a change in production (production change) under the provisions of subpart B of this part that causes the nonroad engine to meet federal emission requirements.

(ii) If the ICI chooses to retest in accordance with paragraph (a)(3)(i)(A) of this section:

(A) The retests are to be completed no later than five working days subsequent to the first emission test;

(B) Should the subject nonroad engine fail the second emission test, then the ICI must initiate a change in production (a production change) under the provisions of subpart B of this part that causes the nonroad engine to meet federal emission requirements.

(iii) If the ICI chooses to initiate a change in production (a production change) under the provisions of subpart B of this part that causes the nonroad engine to meet federal requirements, a change involving adjustments of ad-

justable nonroad engine parameters (for example, adjusting the RPM, timing, air/fuel ratio) represents a change in the specified (that is, nominal) value to be deemed acceptable by EPA.

(iv) A production change made in accordance with this section is to be implemented on all subsequent nonroad engines imported under the certificate of conformity after the date of importation of the nonroad engine which gave rise to the production change.

(v) Commencing with the first nonroad engine receiving the production change, every third nonroad engine imported under the certificate of conformity is to be emission tested to demonstrate compliance with federal emission requirements until, as in paragraph (a)(2)(ii) of this section, a threshold of 300 nonroad engines imported under the certificate of conformity is exceeded without adjustments or other changes in accordance with paragraph (a)(3)(i)(A) of this section, at which time the amount of required emission testing is reduced to every fifth nonroad engine.

(vi) A report concerning these production changes is to be made to both the Manufacturers Operations and Certification Divisions of EPA within ten working days of initiation of the production change. The cause of any failure of an emission test is to be identified, if known;

(4) The applicable deterioration factor, if any;

(5) The emission test results adjusted by the deterioration factor;

(6) Other information that may be specified by applicable regulations or on the certificate of conformity under which the nonroad engine has been modified in order to assure compliance with requirements of the Act;

(7) All information required under § 89.610-96 related to maintenance, warranties, and labeling;

(8) An attestation by the ICI that the ICI is responsible for the nonroad engine's compliance with federal emission requirements, regardless of whether the ICI owns the nonroad engine imported under this section;

(9) The name, address, and telephone number of the person who the ICI prefers to receive EPA notification under § 89.605-96(c);

(10) An attestation by the ICI that all requirements of § 89.607-96 and § 89.610-96 have been met; and

(11) Other information as is deemed necessary by the Administrator.

(b) EPA approval for final admission of a nonroad engine under this section is to be presumed not to have been granted if a requirement of this subpart has not been met. This includes, but is not limited to, properly modifying the nonroad engine to be in conformity in all material respects with the description in the application for certification or not complying with the provisions of § 89.605-96(a)(2) or if the final emission test results, adjusted by the deterioration factor, if applicable, do not comply with applicable emission standards.

(c) Except as provided in paragraph (b) of this section, EPA approval for final admission of a nonroad engine under this section is presumed to have been granted if the ICI does not receive oral or written notice from EPA to the contrary within 15 working days of the date that the Manufacturers Operations Division of EPA receives the ICI's application under paragraph (a) of this section. EPA notice of non-approval may be made to any employee of the ICI. It is the responsibility of the ICI to ensure that the Manufacturers Operations Division of EPA receives the application and to confirm the date of receipt. During this 15 working day hold period, the nonroad engine is to be stored at a location where the Administrator has reasonable access to the nonroad engine for the Administrator's inspection. The storage is to be within 50 miles of the ICI's testing facility to allow the Administrator reasonable access for inspection and/or testing. A storage facility not meeting this criterion must be approved in writing by the Administrator prior to the submittal of the ICI's application under paragraph (a) of this section.

§ 89.606-96 Inspection and testing of imported nonroad engines.

(a) In order to allow the Administrator to determine whether an ICI's production nonroad engines comply with applicable emission requirements or requirements of this subpart, an EPA enforcement officer or authorized

representative is authorized to conduct inspections and/or tests of nonroad engines imported by the ICI. The ICI must admit an EPA enforcement officer or authorized representative during operating hours to any of the following places upon demand and upon presentation of credentials:

(1) Any facility where any nonroad engine imported by the ICI under this subpart was or is being modified, tested, or stored and

(2) Any facility where any record or other document relating to modification, testing, or storage of the nonroad engine, or required to be kept by § 89.607-96, is located. EPA may require inspection or testing of nonroad engines at the test facility used by the ICI or at an EPA-designated testing facility, with transportation and/or testing costs to be borne by the ICI.

(b) Upon admission to any facility referred to in paragraph (a) of this section, an EPA enforcement officer or authorized representative is allowed during operating hours:

(1) To inspect and monitor any part or aspect of activities relating to the ICI's modification, testing, and/or storage of nonroad engines imported under this subpart;

(2) To inspect and make copies of record(s) or document(s) related to modification, testing, and storage of a nonroad engine, or required by § 89.607-96; and

(3) To inspect and photograph any part or aspect of the nonroad engine and any component used in the assembly thereof.

(c) An EPA enforcement officer or authorized representative is to be furnished, by those in charge of a facility being inspected, with such reasonable assistance as the officer or representative may request to help discharge any function listed in this subpart. An ICI must make arrangements with those in charge of a facility operated for its benefit to furnish such reasonable assistance without charge to EPA. Reasonable assistance includes, but is not limited to, clerical, copying, interpretation and translation services, and the making available on request of personnel of the facility being inspected during their working hours to inform the EPA enforcement officer or authorized

representative of how the facility operates and to answer any questions.

(d) The requirements of paragraphs (a), (b), and (c) of this section apply whether or not the ICI owns or controls the facility in question. It is the ICI's responsibility to make such arrangements as may be necessary to assure compliance with paragraphs (a), (b), and (c) of this section. Failure to do so, or other failure to comply with paragraphs (a), (b), or (c), may result in sanctions as provided for in the Act or § 89.612-96(e).

(e) Duly designated enforcement officers are authorized to proceed ex parte to seek warrants authorizing the inspection or testing of the nonroad engines described in paragraph (a) of this section whether or not the enforcement officers first attempted to seek permission from the ICI or facility owner to inspect such nonroad engines.

(f) The results of the Administrator's test under this section comprise the official test data for the nonroad engine for purposes of determining whether the nonroad engine should be permitted final entry under § 89.605-96 or § 89.609-96.

§ 89.607-96 Maintenance of independent commercial importer's records.

(a) The Independent Commercial Importer (ICI) subject to any of the provisions of this subpart must establish and maintain adequately organized and indexed records, correspondence and other applicable documents relating to the certification, modification, test, purchase, sale, storage, registration, and importation of that nonroad engine. The ICI must retain such records for 8 years from the date of final admission or exportation of a nonconforming nonroad engine imported by the ICI. These records include, but are not limited to:

(1) The declaration required by U.S. Bureau of Customs regulations.

(2) Any documents or other written information required by a federal government agency to be submitted or retained in conjunction with the certification, importation or emission testing (if applicable) of nonroad engines;

(3) All bills of sale, invoices, purchase agreements, purchase orders, principal or agent agreements, and correspond-

ence between the ICI and the ultimate purchaser of each nonroad engine and between any agents of the above parties;

(4) For nonroad engines imported by an ICI pursuant to § 89.605-96 or § 89.609-96, documents providing parts identification data (including calibration changes and part numbers and location of such parts on each nonroad engine) associated with the emission control system installed on each nonroad engine demonstrating that such emission control system was properly installed on such nonroad engine;

(5) For nonroad engines imported by an ICI pursuant to § 89.605-96 or § 89.609-96, documents demonstrating that, where applicable, each nonroad engine was emission tested in accordance with subpart E of this part and part 86, subpart I of this chapter;

(6) Documents providing evidence that the requirements of § 89.610-96 have been met;

(7) Documents providing evidence of compliance with all relevant requirements of the Clean Air Act;

(8) Documents providing evidence of the initiation of the 15 working day hold period (that is, evidence that the application submitted pursuant to § 89.605-96(a) or § 89.609-96(b) was received by EPA) for each nonroad engine imported pursuant to § 89.605-96 or § 89.609-96;

(9) For nonroad engines owned by the ICI at the time of importation, documents providing evidence of the date of sale and date of delivery to the ultimate purchaser, together with the name, address, and telephone number of the ultimate purchaser for each nonroad engine imported pursuant to § 89.605-96 or § 89.609-96;

(10) For nonroad engines not owned by the ICI at the time of importation, documents providing evidence and date of release to the owner (including owner's name, address, and telephone number) for each nonroad engine imported pursuant to § 89.605-96 or § 89.609-96;

(11) Documents providing evidence of the date of original manufacture of the nonroad engine. The importer may substitute an alternate date in lieu of the date of original manufacture, provided that the substitution of such alternate

date is approved in advance by the Administrator.

(b) The ICI is responsible for ensuring the maintenance of records required by this section, regardless of whether or not facilities used by the ICI to comply with requirements of this subpart are under the control of the ICI.

§ 89.608-96 “In Use” inspections and recall requirements.

(a) Nonroad engines which have been imported by an Independent Commercial Importer (ICI) pursuant to § 89.605-96 or § 89.609-96 and finally admitted by EPA may be inspected and emission tested by EPA for the recall period specified in § 89.104-96(b).

(b) ICIs must maintain for eight years, and provide to EPA upon request, a list of owners or ultimate purchasers of all nonroad engines imported by the ICI under this subpart.

(c) The Administrator must notify the ICI whenever the Administrator has determined that a substantial number of a class or category of the ICI's nonroad engines, although properly maintained and used, do not conform to the regulations prescribed under section 213 of the Act when in actual use throughout their useful lives. After such notification, the recall regulations at subpart H of this part govern the ICI's responsibilities. References to a manufacturer in the recall regulations apply to the ICI.

§ 89.609-96 Final admission of modification nonroad engines and test nonroad engines.

(a) A nonroad engine may be imported under this section by an Independent Commercial Importer (ICI) possessing a currently valid certificate of conformity only if:

(1) The nonroad engine is six original production years old or older; and

(2) The ICI's name has not been placed on a currently effective EPA list of ICIs ineligible to import such modification/test nonroad engines, as described in paragraph (e) of this section; and

(3) The ICI has a currently valid certificate of conformity for the same nonroad engine class and fuel type as the nonroad engine being imported.

(b) A nonroad engine conditionally imported under this section may be finally admitted into the United States upon approval of the ICI's application by the Administrator. The application is to be made by completing EPA forms, in accordance with EPA instructions. The ICI includes in the application:

(1) The identification information required in § 89.604-96;

(2) An attestation by the ICI that the nonroad engine has been modified and tested in accordance with the applicable emission tests as specified in Subpart B § 89.119-96(a) of this part at a laboratory within the United States;

(3) The results of all emission tests;

(4) The applicable deterioration factor assigned by EPA, if any;

(5) The emission test results adjusted by the applicable deterioration factor;

(6) All information required under § 89.610-96 related to maintenance, warranties, and labeling;

(7) An attestation by the ICI that the ICI is responsible for the nonroad engine's compliance with federal emission requirements, regardless of whether the ICI owns the nonroad engine imported under this section;

(8) The applicable address and telephone number of the ICI, or the name, address, and telephone number of the person who the ICI prefers to receive EPA notification under § 89.609-96(d);

(9) An attestation by the ICI that all requirements of § 89.607-95 and § 89.610-96 have been met; and

(10) Such other information as is deemed necessary by the Administrator.

(c) EPA approval for final admission of a nonroad engine under this section is presumed not to have been granted if any requirement of this subpart has not been met.

(d) Except as provided in paragraph (c) of this section, EPA approval for final admission of a nonroad engine under this section is presumed to have been granted if the ICI does not receive oral or written notice from EPA to the contrary within 15 working days of the date that the Manufacturers Operations Division of EPA receives the ICI's application under paragraph (b) of this section. Such EPA notice of non-approval may be made to any employee

of the ICI. It is the responsibility of the ICI to ensure that the Manufacturers Operations Division of EPA receives the application and to confirm the date of receipt. During this 15 working day hold period, the nonroad engine is stored at a location where the Administrator has reasonable access to the nonroad engine for the Administrator's inspection. The storage is to be within 50 miles of the ICI's testing facility to allow the Administrator reasonable access for inspection and/or testing. A storage facility not meeting this criterion must be approved in writing by the Administrator prior to the submittal of the ICI's application under paragraph (b) of this section.

(e) *EPA list of ICIs ineligible to import nonroad engines for modification/test.* EPA maintains a current list of ICIs who have been determined to be ineligible to import nonroad engines under this section. The determination of ineligibility is made in accordance with the criteria and procedures in § 89.612-96(e) of this subpart.

(f) *Inspections.* Prior to final admission, a nonroad engine imported under this section is subject to special inspections as described in § 89.606-96 with these additional provisions:

(1) If, in the judgment of the Administrator, a significant number of nonroad engines imported by an ICI fail to comply with emission requirements upon inspection or retest or if the ICI fails to comply with a provision of these regulations that pertain to nonroad engines imported pursuant to § 89.609-96, the ICI may be placed on the EPA list of ICIs ineligible to import nonroad engines under this section as specified in paragraph (e) of this section and § 89.612-96(e).

(2) An individual nonroad engine which fails a retest or inspection is to be repaired and retested, as applicable, to demonstrate compliance with emission requirements before final admission is granted by EPA.

(3) Unless otherwise specified by EPA, the ICI bears the costs of all retesting under this subsection, including transportation.

(g) *In-use inspection and testing.* A nonroad engine imported under this section may be tested or inspected by EPA at any time during the recall pe-

riod specified in § 89.104-96(b), in accordance with § 89.608-96(a). If, in the judgment of the Administrator, a significant number of properly maintained and used nonroad engines imported by the ICI pursuant to this section fail to meet emission requirements, the name of the ICI may be placed on the EPA list of ICIs ineligible to import nonroad engines under the modification/test provision as specified in paragraph (e) of this section and § 89.612-96(e).

§ 89.610-96 Maintenance instructions, warranties, emission labeling.

The provisions of this section are applicable to all nonroad engines imported under the provisions of § 89.605-96 or § 89.609-96.

(a) *Maintenance instructions.* (1) The Independent Commercial Importer (ICI) must furnish to the purchaser, or to the owner of each nonroad engine imported under § 89.605-96 or § 89.609-96 of this subpart, written instructions for the maintenance and use of the nonroad engine by the purchaser or owner. Each application for final admission of a nonroad engine is to provide an attestation that such instructions have been or will be (if the ultimate purchaser is unknown) furnished to the purchaser or owner of such nonroad engine at the time of sale or delivery. The ICI must maintain a record of having furnished such instructions.

(2) For each nonroad engine imported under § 89.609-96, a copy of the maintenance and use instructions is to be maintained in a file containing the records for that nonroad engine.

(3) The maintenance and use instructions are not to contain requirements more restrictive than those set forth in § 89.109-96 (Maintenance Instructions) and are to be in sufficient detail and clarity that a mechanic of average training and ability can maintain or repair the nonroad engine.

(4) For each nonroad engine imported pursuant to § 89.605-96 or § 89.609-96, ICIs must furnish with each nonroad engine a list of the emission control parts, emission-related parts added by the ICI, and the emission control and emission-related parts furnished by the Original Engine Manufacturer (OEM).

(5) The information required in this section to be furnished to the ultimate purchaser or owner is to be copied and maintained in a file containing the records for that nonroad engine prior to submitting each application for final admission pursuant to § 89.605-96(a) or § 89.609-96(b).

(b) *Warranties.* (1) ICIs must submit to the Manufacturers Operations Division of EPA sample copies (including revisions) of any warranty documents required by this section prior to importing nonroad engines under this subpart.

(2) ICIs must provide to nonroad engine owners emission warranties identical to those required by sections 207(a) of the Act. The warranty period for each nonroad engine is to commence on the date the nonroad engine is delivered by the ICI to the ultimate purchaser or owner.

(3) ICIs must provide warranty insurance coverage by a prepaid mandatory service insurance policy underwritten by an independent insurance company. The policy is to:

(i) Be subject to the approval of the Administrator if the insurance coverage is less than the required warranty;

(ii) At a minimum, provide coverage for emission-related components installed or modified by the ICI and, to the maximum extent possible, the emission-related components installed by the OEM;

(iii) Be transferable to each successive owner for the periods specified in § 89.104-96(c); and

(iv) Provide that in the absence of an ICI's facility being reasonably available (that is, within 50 miles) for performance of warranty repairs, the warranty repairs may be performed anywhere.

(4) ICIs must attest in each application for final admission that the warranty requirements have been met, that the mandatory insurance has been paid and is in effect, and that certificates and statements of the warranties have been or will be provided to the owner or ultimate purchaser. A copy of the warranties and evidence that the warranties are paid and in effect is to be maintained in a file containing the records for each nonroad engine prior

to submitting each application for final admission pursuant to § 89.605-96(a) or § 89.609-96(b).

(c) *Emission labeling.* (1) For each nonroad engine imported pursuant to § 89.605-96 or § 89.609-96, the ICI must affix a permanent legible label which identifies each nonroad engine and also satisfies the following:

(i) The label meets all the requirements of § 89.110-96 and contains the following statement "This nonroad engine was originally produced in (month and year of original production). It has been imported and modified by (ICI's name, address, and telephone number) to conform to United States emission regulations applicable to the (year) model year."

(ii) If the nonroad engine is owned by the ICI at the time of importation, the label also states "This nonroad engine is warranted for five years or 3000 hours of operation from the date of purchase, whichever first occurs."

(iii) If the nonroad engine is not owned by the ICI at the time of importation, the label states "This nonroad engine is warranted for five years or 3000 hours of operation from the date of release to the owner, whichever first occurs."

(iv) For nonroad engines imported under § 89.609-96, the label clearly states in bold letters that "This nonroad engine has not been manufactured under a certificate of conformity but conforms to United States emission regulations under a modification/test program." For all nonroad engines imported pursuant to § 89.605-96 or § 89.609-96, the label contains the vacuum hose routing diagram applicable to the nonroad engines.

(2) As part of the application to the Administrator for final admission of each individual nonroad engine under § 89.609-96, the ICI must maintain a copy of the labels for each nonroad engine in a file containing the records for that nonroad engine prior to submitting each application for final admission. ICIs importing under § 89.605-96 or § 89.609-96 must attest to compliance with the preceding labeling requirements of this section in each application for final admission.

§ 89.611-96 Exemptions and exclusions.

(a) Individuals, as well as ICIs, are eligible for importing nonroad engines into the United States under the provisions of this section, unless otherwise specified.

(b) Notwithstanding other requirements of this subpart, a nonroad engine entitled to one of the temporary exemptions of this paragraph may be conditionally admitted into the United States if prior written approval for the conditional admission is obtained from the Administrator. Conditional admission is to be under bond. The Administrator may request that the U.S. Customs Service require a specific bond amount to ensure compliance with the requirements of the Act and this subpart. A written request for approval from the Administrator is to contain the identification required in § 89.604-96(a) (except for § 89.604-96(a)(5)) and information that demonstrates that the importer is entitled to the exemption. Noncompliance with provisions of this section may result in the forfeiture of the total amount of the bond or exportation of the nonroad engine. The following temporary exemptions are permitted by this paragraph:

(1) *Exemption for repairs or alterations.* Upon written approval by EPA, an owner of nonroad engines may conditionally import under bond such nonroad engines solely for purpose of repair(s) or alteration(s). The nonroad engines may not be operated in the United States other than for the sole purpose of repair or alteration. They may not be sold or leased in the United States and are to be exported upon completion of the repair(s) or alteration(s).

(2) *Testing exemption.* A test nonroad engine may be conditionally imported by a person subject to the requirements of § 89.905. A test nonroad engine may be operated in the United States provided that the operation is an integral part of the test. This exemption is limited to a period not exceeding one year from the date of importation unless a request is made by the appropriate importer concerning the nonroad engine in accordance with § 89.905(f) for a subsequent one-year period.

(3) *Precertification exemption.* A prototype nonroad engine for use in applying to EPA for certification pursuant to this subpart may be conditionally imported subject to applicable provisions of § 89.906 and the following requirements:

(i) No more than one prototype nonroad engine for each engine family for which an importer is seeking certification is to be imported.

(ii) The granting of precertification exemptions by the Administrator is discretionary. Normally, no more than three outstanding precertification exemptions are allowed for each importer. No precertification exemption is allowed if the importer requesting the exemption is in noncompliance with any requirement of this subpart until the noncompliance is corrected.

(iii) Unless a certificate of conformity is issued for the prototype nonroad engine and the nonroad engine is finally admitted pursuant to the requirements of § 89.605 within 180 days from the date of entry, the total amount of the bond is to be forfeited or the nonroad engine exported unless an extension is granted by the Administrator. A request for an extension is to be in writing and received by the Administrator prior to the date that the precertification exemption expires.

(iv) Such precertification nonroad engine may not be operated in the United States other than for the sole purpose of the precertification exemption.

(4) *Display exemptions.* (i) A nonroad engine intended solely for display may be conditionally imported subject to the requirements of § 89.907.

(ii) A display nonroad engine may be imported by any person for purposes related to a business or the public interest. Such purposes do not include collections normally inaccessible or unavailable to the public on a daily basis, display of a nonroad engine at a dealership, private use, or other purpose that the Administrator determines is not appropriate for display exemptions. A display nonroad engine may not be sold in the United States and may not be operated in the United States except for the operation incident and necessary to the display purpose.

(iii) A temporary display exemption is granted for 12 months or for the duration of the display purpose, whichever is shorter. Two extensions of up to 12 months each are available upon approval by the Administrator. In no circumstances, however, may the total period of exemption exceed 36 months. The U.S. Customs Service bonds a temporary display exemption.

(c) Notwithstanding any other requirement of this subpart, a nonroad engine may be finally admitted into the United States under this paragraph if prior written approval for such final admission is obtained from the Administrator. Conditional admission of these nonroad engines under this subpart is not permitted for the purpose of obtaining such written approval from the Administrator. A request for approval is to contain the identification information required in § 89.604-96(a) (except for § 89.604-96(a)(5)) and information that demonstrates that the importer is entitled to the exemption or exclusion. The following exemptions or exclusions are permitted by this paragraph:

(1) *National security exemption.* A nonroad engine may be imported under the national security exemption found at § 89.908.

(2) *Hardship exemption.* The Administrator may exempt on a case-by-case basis a nonroad engine from federal emission requirements to accommodate unforeseen cases of extreme hardship or extraordinary circumstances.

(3) *Exemption for nonroad engines identical to United States certified versions.*

(i) A person (including businesses) is eligible for importing a nonroad engine into the United States under the provisions of this paragraph. An exemption will be granted if the nonroad engine:

(A) is owned by the importer;

(B) is not offered for importation for the purpose of resale; and

(C) is proven to be identical, in all material respects, to a nonroad engine certified by the Original Engine Manufacturer (OEM) for sale in the United States or is proven to have been modified to be identical, in all material respects, to a nonroad engine certified by the OEM for sale in the United States according to complete written instructions provided by the OEM's United

States representative, or his/her designee.

(ii) *Proof of conformity.* (A) Documentation submitted pursuant to this section for the purpose of proving conformity of individual nonroad engines is to contain sufficiently organized data or evidence demonstrating that the nonroad engine identified pursuant to § 89.604-96(a) is identical, in all material respects, to a nonroad engine identified in an OEM's application for certification.

(B) If the documentation does not contain all the information required by this part, or is not sufficiently organized, EPA notifies the importer of any areas of inadequacy, and that the documentation does not receive further consideration until the required information or organization is provided.

(C) If EPA determines that the documentation does not clearly or sufficiently demonstrate that a nonroad engine is eligible for importation, EPA notifies the importer in writing.

(D) If EPA determines that the documentation clearly and sufficiently demonstrates that a nonroad engine is eligible for importation, EPA grants approval for importation and notifies the importer in writing. Notwithstanding any other requirement of this subpart, the notice constitutes approval for final admission into the United States.

(d) Foreign diplomatic and military personnel may import a nonconforming nonroad engine without bond. At the time of admission, the importer must submit to the Administrator the written report required in § 89.604-96(a) (except for information required by § 89.604-96(a)(5)) and a statement from the U.S. Department of State confirming qualification for this exemption. The nonroad engine may not be sold in the United States and must be exported if the individual's diplomatic status is no longer applicable, as determined by the Department of State, unless subsequently brought into conformity in accordance with §§ 89.605-96, 89.609-96, or 89.611-96(c)(3).

(e) *Competition exclusion.* A nonconforming engine may be imported by any person provided the importer demonstrates to the Administrator that the engine is used to propel a vehicle

used solely for competition and obtains prior written approval from the Administrator. A nonconforming engine imported pursuant to this paragraph may not be operated in the United States except for that operation incident and necessary for the competition purpose, unless subsequently brought into conformity with United States emission requirements in accordance with §§ 89.605-96, 89.609-96, or 89.611-96(c)(3).

(f) *Exclusions/exemptions based on date of original manufacture.* (1) Notwithstanding any other requirements of this subpart, the following nonroad engines are excluded, as determined by the engine's gross power output, from the requirements of the Act in accordance with section 213 of the Act and may be imported by any person:

(i) All nonroad engines greater than or equal to 37 kW but less than 75 kW originally manufactured prior to January 1, 1998.

(ii) All nonroad engines greater than or equal to 75 kW but less than 130 kW originally manufactured prior to January 1, 1997.

(iii) All nonroad engines greater than or equal to 130 kW but less than or equal to 560 kW originally manufactured prior to January 1, 1996.

(iv) All nonroad engines greater than 560 kW originally manufactured prior to January 1, 2000.

(2) Notwithstanding other requirements of this subpart, a nonroad engine not subject to an exclusion under § 89.611-96(f)(1) but greater than 20 original production (OP) years old is entitled to an exemption from the requirements of the Act, provided that it has not been modified in those 20 OP years and it is imported into the United States by an ICI. At the time of admission, the ICI must submit to the Administrator the written report required in § 89.604-96(a) (except for information required by § 89.604-96(a)(5)).

(g) An application for exemption and exclusion provided for in paragraphs (b), (c), and (e) of this section is to be mailed to: U.S. Environmental Protection Agency, Office of Mobile Sources, Manufacturers Operations Division (6405-J), 401 M Street, SW, Washington, DC 20460, Attention: Imports.

§ 89.612-96 Prohibited acts; penalties.

(a) The importation of a nonroad engine, including a nonroad engine incorporated into a nonroad vehicle or nonroad equipment, which is not covered by a certificate of conformity other than in accordance with this subpart and the entry regulations of the U.S. Customs Service is prohibited. Failure to comply with this section is a violation of section 213(d) and section 203 of the Act.

(b) Unless otherwise permitted by this subpart, during a period of conditional admission, the importer of a nonroad engine may not:

(1) Register, license, or operate the nonroad engine in the United States;

(2) Sell or offer the nonroad engine for sale;

(3) Store the nonroad engine on the premises of a dealer (unless approved by the Administrator), owner, or purchaser;

(4) Relinquish control of the nonroad engine to the owner or purchaser; or

(5) Cause a nonroad engine to be altered in any manner subsequent to modification and testing, if applicable, for which an application for final admission is based and submitted to the Administrator, unless approved in advance by the Administrator.

(c) A nonroad engine conditionally admitted pursuant to § 89.604-96 and not granted final admission within 120 days of such conditional admission, or within such additional time as the Administrator and the U.S. Customs Service may allow, is deemed to be unlawfully imported into the United States in violation of section 213(d) and section 203 of the Act, unless the nonroad engine has been delivered to the U.S. Customs Service for export or other disposition under applicable Customs laws and regulations. A nonroad engine not so delivered is subject to seizure by the U.S. Customs Service.

(d) An importer who violates section 213(d) and section 203 of the Act is subject to the provisions of section 209 of the Act and is also subject to a civil penalty under section 205 of the Act of not more than \$25,000 for each nonroad engine subject to the violation. In addition to the penalty provided in the Act, where applicable, a person or entity

who imports an engine under the exemption provisions of § 89.611-96(b) and, who fails to deliver the nonroad engine to the U.S. Customs Service is liable for liquidated damages in the amount of the bond required by applicable Customs laws and regulations.

(e)(1) An ICI whose nonroad engines imported under § 89.605-96 or § 89.609-96 fail to conform to federal emission requirements after modification and/or testing or who fails to comply with applicable provisions of this subpart, may, in addition to any other applicable sanctions and penalties, be subject to any, or all, of the following sanctions:

(i) The ICI's currently held certificates of conformity may be revoked or suspended;

(ii) The ICI may be deemed ineligible to apply for new certificates of conformity for up to three years; and

(iii) The ICI may be deemed ineligible to import nonroad engines under § 89.609-96 in the future and be placed on a list of ICIs ineligible to import nonroad engines under the provisions of § 89.609-96.

(2) Grounds for the actions described in paragraph (e)(1) of this section include, but are not limited to, the following:

(i) Action or inaction by the ICI or the laboratory performing the emission test on behalf of the ICI, which results in fraudulent, deceitful, or grossly inaccurate representation of any fact or condition which affects a nonroad engine's eligibility for admission to the United States under this subpart;

(ii) Failure of a significant number of imported nonroad engines to comply with federal emission requirements upon EPA inspection or retest; or

(iii) Failure by an ICI to comply with requirements of this subpart.

(3) The following procedures govern any decision to suspend, revoke, or refuse to issue certificates of conformity under this subpart:

(i) When grounds appear to exist for the actions described in paragraph (e)(1) of this section, the Administrator must notify the ICI in writing of any intended suspension or revocation of a certificate of conformity, proposed ineligibility to apply for new certificates of conformity, or intended suspension

of eligibility to conduct modification/testing under § 89.609-96, and the grounds for such action.

(ii) Except as provided by paragraph (e)(3)(iv), the ICI must take the following actions before the Administrator will consider withdrawing notice of intent to suspend or revoke the ICI's certificate of conformity or to deem the ICI ineligible to apply for new certification or to deem the ICI ineligible to perform modification/testing under § 89.609-96:

(A) Submit a written report to the Administrator which identifies the reason for the noncompliance of the nonroad engine, describes the proposed remedy, including a description of any proposed quality control and/or quality assurance measures to be taken by the ICI to prevent the future occurrence of the problem, and states the date on which the remedies are to be implemented or

(B) Demonstrate that the nonroad engine does in fact comply with applicable regulations in this chapter by retesting, if applicable, the nonroad engine in accordance with the applicable emission test specified in subpart E of this part.

(iii) An ICI may request, within 15 calendar days of the Administrator's notice of intent to suspend or revoke the ICI's certificate of conformity or to deem the ICI ineligible to apply for new certificates or to deem the ICI ineligible to perform modification/testing under § 89.609-96, that the Administrator grant such ICI a hearing:

(A) As to whether the tests, if applicable, have been properly conducted,

(B) As to any substantial factual issue raised by the Administrator's proposed action.

(iv) If, after the Administrator notifies an ICI of the intent to suspend or revoke the ICI's certificate of conformity or to deem the ICI ineligible to apply for new certificates or to deem the ICI ineligible to perform modification/testing under § 89.609-96 and prior to any final suspension or revocation, the ICI demonstrates to the Administrator's satisfaction that the decision to initiate suspension or revocation of the certificate of conformity or eligibility to perform modification/testing under § 89.609-96 was based on erroneous

information, the Administrator will withdraw the notice of intent.

(4) Hearings on suspensions and revocations of certificates of conformity or of eligibility to apply for new certificates or of eligibility to perform modification/testing under § 89.609–96 will be held in accordance with the following:

(i) The procedures prescribed by this section will apply whenever an ICI requests a hearing pursuant to paragraph (e)(3)(iii) of this section.

(ii) Hearings under paragraph (e)(3)(iii) will be held in accordance with the procedures outlined in § 86.614 of this chapter, where applicable, provided that where § 86.612 is referred to in § 86.614: § 86.612(a) is replaced by § 89.612–96(e)(2); and § 86.612(i) is replaced by § 89.612–96(e)(3)(iii).

(5) When a hearing is requested under this section and it clearly appears from the data or other information contained in the request for a hearing, or submitted at the hearing, that no genuine and substantial question of fact exists with respect to the issue of whether the ICI failed to comply with this subpart, the Administrator will enter an order denying the request for a hearing, or terminating the hearing, and suspending or revoking the certificate of conformity and/or deeming the ICI ineligible to apply for new certificates or to perform modification/testing under § 89.609–96.

(6) In lieu of requesting a hearing under paragraph (e)(3)(iii) of this section, an ICI may respond in writing to EPA's charges in the notice of intent to suspend or revoke. An ICI's written response must be received by EPA within 30 days of the date of EPA's notice of intent. No final decision to suspend or revoke will be made before that time.

§ 89.613–96 Treatment of confidential information.

The provisions for treatment of confidential information as described in § 89.7 apply.

Subpart H—Recall Regulations

§ 89.701 Applicability.

The requirements of subpart H are applicable to all nonroad engines sub-

ject to the provisions of subpart A of part 89.

§ 89.702 Definitions.

The definitions in subpart A of this part apply to this subpart.

§ 89.703 Applicability of part 85, subpart S.

(a) Nonroad engines subject to provisions of subpart B of this part are subject to recall regulations specified in part 85, subpart S of this title, except for the items set forth in this section.

(b) Reference to section 214 of the Clean Air Act in § 85.1801 is replaced by reference to section 216 of the Clean Air Act.

(c) Reference to section 202 of the Act in § 85.1802(a) is replaced by reference to section 213 of the Act.

(d) Reference to “family particulate emission limits as defined in Part 86 promulgated under section 202 of the Act” in § 85.1803(a) and § 85.1805(a)(1) is replaced by reference to family emission limits as defined in part 89 promulgated under section 213 of the Act.

(e) Reference to “vehicles or engines” throughout the subpart is replaced by reference to “engines.”

Subpart I—Emission Defect Reporting Requirements

§ 89.801 Applicability.

The requirements of subpart I are applicable to all nonroad engines subject to the provisions of subpart A of part 89. The requirement to report emission-related defects affecting a given class or category of engines remains applicable for five years from the end of the model year in which such engines were manufactured.

§ 89.802 Definitions.

The definitions in subpart A of this part apply to this subpart.

§ 89.803 Applicability of part 85, subpart T.

(a) Nonroad engines subject to provisions of subpart B of this part are subject to emission defect reporting requirements specified in part 85, subpart T of this chapter, except for the items set forth in this section.

(b) Section 85.1901 is replaced by § 89.801.

(c) Reference to the Clean Air Act, 42 U.S.C. 1857 in § 85.1902(a) is replaced by reference to the Clean Air Act, 42 U.S.C. 7401.

(d) Reference to the “approved Application for Certification required by 40 CFR 86.077–22 and like provisions of Part 85 and Part 86 of Title 40 of the Code of Federal Regulations” in § 85.1902(b) is replaced by reference to the approved application for certification required by § 89.115–96 and like provisions of part 89 of this chapter.

(e) Reference to section 202(d) of the Act in § 85.1902(c) is replaced by reference to section 202(d) and section 213 of the Act.

(f) Reference to section 214 of the Act in § 85.1902 (e) and (f) is replaced by reference to section 216 of the Act.

(g) Reference to “vehicles or engines” throughout the subpart is replaced by reference to “engines.”

Subpart J—Exemption Provisions

§ 89.901 Applicability.

The requirements of subpart J are applicable to all nonroad engines subject to the provisions of subpart A of part 89.

§ 89.902 Definitions.

The definitions in subpart A of this part apply to this subpart. The following definitions also apply to this subpart.

Exemption means exemption from the prohibitions of § 89.1006.

Export exemption means an exemption granted under § 89.1004(b) for the purpose of exporting new nonroad engines.

National security exemption means an exemption which may be granted under § 89.1004(b) for the purpose of national security.

Manufacturer-owned nonroad engine means an uncertified nonroad engine owned and controlled by a nonroad engine manufacturer and used in a manner not involving lease or sale by itself or in a vehicle or piece of equipment employed from year to year in the ordinary course of business for product development, production method assessment, and market promotion purposes.

Testing exemption means an exemption which may be granted under § 89.1004(b) for the purpose of research investigations, studies, demonstrations or training, but not including national security.

§ 89.903 Application of section 216(10) of the Act.

(a) For the purpose of determining the applicability of section 216(10) of the Act, an internal combustion engine (including the fuel system) that is not used in a motor vehicle is deemed a nonroad engine if it meets the definition in subpart A of this part.

(b) EPA will maintain a list of nonroad engines that have been determined to be excluded because they are used solely for competition. This list will be available to the public and may be obtained by writing to the following address: Chief, Selective Enforcement Auditing Section, Manufacturers Operations Division (6405–J), Environmental Protection Agency, 401 M Street SW, Washington, DC 20460.

(c) Upon written request, EPA will make written determinations as to whether certain engines are or are not nonroad engines. Engines that are determined not to be nonroad engines are excluded from regulations under this part.

§ 89.904 Who may request an exemption.

(a) Any person may request a testing exemption under § 89.905.

(b) Any nonroad engine manufacturer may request a national security exemption under § 89.908.

(c) For nonroad engine manufacturers, nonroad engines manufactured for export purposes are exempt without application, subject to the provisions of § 89.909.

(d) For eligible manufacturers, as determined by § 89.906, manufacturer-owned nonroad engines are exempt without application, subject to the provisions of § 89.906.

(e) For any person, display nonroad engines are exempt without application, subject to the provisions of § 89.907.

§ 89.905 Testing exemption.

(a) Any person requesting a testing exemption must demonstrate the following:

(1) That the proposed test program has a purpose which constitutes an appropriate basis for an exemption in accordance with this section;

(2) That the proposed test program necessitates the granting of an exemption;

(3) That the proposed test program exhibits reasonableness in scope; and

(4) That the proposed test program exhibits a degree of control consonant with the purpose of the test program and EPA's monitoring requirements.

(5) Paragraphs (b), (c), (d), and (e) of this section describe what constitutes a sufficient demonstration for each of the four identified elements.

(b) With respect to the purpose of the proposed test program, an appropriate purpose would be research, investigations, studies, demonstrations, or training, but not national security. A concise statement of purpose is a required item of information.

(c) With respect to the necessity that an exemption be granted, necessity arises from an inability to achieve the stated purpose in a practicable manner without performing or causing to be performed one or more of the prohibited acts under § 89.1003. In appropriate circumstances, time constraints may be a sufficient basis for necessity, but the cost of certification alone, in the absence of extraordinary circumstances, is not a basis for necessity.

(d) With respect to reasonableness, a test program must exhibit a duration of reasonable length and affect a reasonable number of engines. In this regard, required items of information include:

(1) An estimate of the program's duration, and

(2) The maximum number of nonroad engines involved.

(e) With respect to control, the test program must incorporate procedures consistent with the purpose of the test and be capable of affording EPA monitoring capability. As a minimum, required items of information include:

(1) The technical nature of the test;

(2) The site of the test;

(3) The time or mileage duration of the test;

(4) The ownership arrangement with regard to the engines involved in the test;

(5) The intended final disposition of the engines;

(6) The manner in which the engine identification numbers will be identified, recorded, and made available; and

(7) The means or procedure whereby test results will be recorded.

(f) A manufacturer of new nonroad engines may request a testing exemption to cover nonroad engines intended for use in test programs planned or anticipated over the course of a subsequent one-year period. Unless otherwise required by the Director, Manufacturers Operations Division, a manufacturer requesting such an exemption need only furnish the information required by paragraphs (a)(1) and (d)(2) of this section along with a description of the record-keeping and control procedures that will be employed to assure that the engines are used for purposes consistent with paragraph (a) of this section.

§ 89.906 Manufacturer-owned exemption and precertification exemption.

(a) Except as provided in paragraph (b) of this section, any manufacturer-owned nonroad engine, as defined by § 89.902, is exempt from § 89.1003, without application, if the manufacturer complies with the following terms and conditions:

(1) The manufacturer must establish, maintain, and retain the following adequately organized and indexed information on each exempted engine:

(i) Engine identification number,

(ii) Use of the engine on exempt status and

(iii) Final disposition of any engine removed from exempt status; and

(2) The manufacturer must provide right of entry and access to these records to EPA authorized representatives as outlined in § 89.506-96.

(3) Unless the requirement is waived or an alternate procedure is approved by the Director, Manufacturers Operations Division, the manufacturer must permanently affix a label to each

nonroad engine on exempt status. This label should

(i) Be affixed in a readily visible portion of the engine,

(ii) Be attached in such a manner that cannot be removed without destruction or defacement,

(iii) State in the English language and in block letters and numerals of a color that contrasts with the background of the label, the following information:

(A) The label heading “Emission Control Information;”

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement, engine family identification, and model year of engine; or person of office to be contacted for further information about the engine;

(D) The statement “This nonroad engine is exempt from the prohibitions of 40 CFR section 90.1003.”

(4) No provision of paragraph (a)(3) of this section prevents a manufacturer from including any other information it desires on the label.

(b) Any independent commercial importer that desires a precertification exemption pursuant to § 89.611(b)(3) and is in the business of importing, modifying, or testing uncertified nonroad engines for resale under the provisions of § 89.611 et seq., must apply to the Director, Manufacturers Operations Division. The Director may require such independent commercial importer to submit information regarding the general nature of the fleet activities, the number of nonroad engines involved, and a demonstration that adequate record-keeping procedures for control purposes will be employed.

§ 89.907 Display exemption.

Where an uncertified nonroad engine is a display engine to be used solely for display purposes, will only be operated incident and necessary to the display purpose, and will not be sold unless an applicable certificate of conformity has been received or the engine has been finally admitted pursuant to subpart G of this part, no request for exemption of the engine is necessary.

§ 89.908 National security exemption.

(a)(1) Any nonroad engine, otherwise subject to this part, which is used in a vehicle that exhibits substantial features ordinarily associated with military combat such as armor and/or permanently affixed weaponry and which will be owned and/or used by an agency of the federal government with responsibility for national defense, will be considered exempt from these regulations for purposes of national security. No request for exemption is necessary.

(2) Manufacturers may request a national security exemption for any nonroad engine, otherwise subject to this part, which does not meet the conditions described in paragraph (a)(1) of this section. A manufacturer requesting a national security exemption must state the purpose for which the exemption is required and the request must be endorsed by an agency of the federal government charged with responsibility for national defense.

(b) EPA will maintain a list of models of nonroad engines (and the vehicles which use them) that have been granted a national security exemption under paragraph (a)(2) of this section. This list will be available to the public and may be obtained by writing to the following address: Group Manager, Engine Compliance Programs Group, Engine Programs and Compliance Division (6403J) Environmental Protection Agency, 401 M Street SW., Washington, DC 20460.

[61 FR 52102, Oct. 4, 1996]

§ 89.909 Export exemptions.

(a) A new nonroad engine intended solely for export, and so labeled or tagged on the outside of the container and on the engine itself, is subject to the provisions of § 89.1003, unless the importing country has new nonroad engine emission standards which differ from EPA standards.

(b) For the purpose of paragraph (a) of this section, a country having no standards, whatsoever, is deemed to be a country having emission standards which differ from EPA standards.

(c) EPA will maintain a list of foreign countries that have in force nonroad emission standards identical to EPA standards and have so notified

EPA. This list may be obtained by writing to the following address: Chief, Selective Enforcement Auditing Section, Manufacturers Operations Division (6405-J), Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. New nonroad engines exported to such countries must comply with EPA certification regulations.

(d) It is a condition of any exemption for the purpose of export under paragraph (a) of this section, that such exemption is void ab initio with respect to a new nonroad engine intended solely for export, where such nonroad engine is sold, or offered for sale, to an ultimate purchaser or otherwise distributed or introduced into commerce in the United States for purposes other than export.

§ 89.910 Granting of exemptions.

(a) If upon completion of the review of an exemption request made pursuant to § 89.905 or § 89.908, EPA determines it is appropriate to grant such an exemption, a memorandum of exemption is to be prepared and submitted to the person requesting the exemption. The memorandum is to set forth the basis for the exemption, its scope, and such terms and conditions as are deemed necessary. Such terms and conditions generally include, but are not limited to, agreements by the applicant to conduct the exempt activity in the manner described to EPA, create and maintain adequate records accessible to EPA at reasonable times, employ labels for the exempt engines setting forth the nature of the exemption, take appropriate measures to assure that the terms of the exemption are met, and advise EPA of the termination of the activity and the ultimate disposition of the engines.

(b) Any exemption granted pursuant to paragraph (a) of this section is deemed to cover any subject engine only to the extent that the specified terms and conditions are complied with. A breach of any term or condition causes the exemption to be void ab initio with respect to any engine. Consequently, the causing or the performing of an act prohibited under § 89.1003(a)(1) or (a)(3), other than in strict conformity with all terms and conditions of this exemption, renders the person

to whom the exemption is granted, and any other person to whom the provisions of § 89.1003(a) are applicable, liable to suit under sections 204 and 205 of the Act.

§ 89.911 Submission of exemption requests.

Requests for exemption or further information concerning exemptions and/or the exemption request review procedure should be addressed to: Chief, Selective Enforcement Auditing Section, Manufacturers Operations Division (6405-J), Environmental Protection Agency, 401 M Street SW, Washington, DC 20460.

§ 89.912 Treatment of confidential information.

The provisions for treatment of confidential information as described in § 89.7 apply.

Subpart K—General Enforcement Provisions and Prohibited Acts

§ 89.1001 Applicability.

The requirements of subpart K are applicable to all nonroad engines subject to the provisions of subpart A of part 89, and to all nonroad vehicles and equipment that contain such nonroad engines.

§ 89.1002 Definitions.

The definitions in subpart A of this part apply to this subpart.

§ 89.1003 Prohibited acts.

(a) The following acts and the causing thereof are prohibited:

(1)(i) In the case of a manufacturer of new nonroad engines, vehicles, or equipment for distribution in commerce, the sale, or the offering for sale, or the introduction, or delivery for introduction, into commerce, of any new nonroad engine manufactured after the applicable effective date under this part, or any nonroad vehicle or equipment containing such engine, unless such engine is covered by a certificate of conformity issued (and in effect) under regulations found in this part.

(ii) In the case of any person, except as provided in subpart G of this part, the importation into the United States

of any new nonroad engine manufactured after the applicable effective date under this part, or any nonroad vehicle or equipment containing such engine, unless such engine is covered by a certificate of conformity issued (and in effect) under regulations found in this part.

(2)(i) For a person to fail or refuse to permit access to or copying of records or to fail to make reports or provide information required under § 89.1004.

(ii) For a person to fail or refuse to permit entry, testing, or inspection authorized under §§ 89.129–96, 89.506–96 or 89.1004.

(iii) For a person to fail or refuse to perform tests, or to have tests performed as required under §§ 89.119–96 or 89.1004.

(iv) For a person to fail to establish or maintain records as required under § 89.1004.

(3)(i) For a person to remove or render inoperative a device or element of design installed on or in a nonroad engine, vehicle or equipment in compliance with regulations under this part prior to its sale and delivery to the ultimate purchaser, or for a person knowingly to remove or render inoperative such a device or element of design after the sale and delivery to the ultimate purchaser; or

(ii) For a person to manufacture, sell or offer to sell, or install, a part or component intended for use with, or as part of, a nonroad engine, vehicle or equipment, where a principal effect of the part or component is to bypass, defeat, or render inoperative a device or element of design installed on or in a nonroad engine in compliance with regulations issued under this part, and where the person knows or should know that the part or component is being offered for sale or installed for this use or put to such use.

(4) For a manufacturer of a new nonroad engine subject to standards prescribed under this part:

(i) To sell, offer for sale, or introduce or deliver into commerce, a nonroad engine unless the manufacturer has complied with the requirements of § 89.1007.

(ii) To sell, offer for sale, or introduce or deliver into commerce, a nonroad engine unless a label or tag is

affixed to the engine in accordance with § 89.110–96.

(iii) To fail or refuse to comply with the requirements of § 89.1008.

(iv) Except as provided in § 89.109–96, to provide directly or indirectly in any communication to the ultimate purchaser or a subsequent purchaser that the coverage of a warranty under the Act is conditioned upon use of a part, component, or system manufactured by the manufacturer or a person acting for the manufacturer or under its control, or conditioned upon service performed by such persons.

(v) To fail or refuse to comply with the terms and conditions of the warranty under § 89.1007.

(5) For a person to circumvent or attempt to circumvent the residence time requirements of subsection (b)(2)(iii) of the nonroad engine definition in § 89.2.

(6) For a manufacturer of nonroad vehicles or equipment to distribute in commerce, sell, offer for sale, or introduce into commerce a nonroad vehicle or piece of equipment, manufactured on or after the implementation date applicable to engines in such vehicle or equipment under § 89.102–96(a), which contains an engine not covered by a certificate of conformity.

(b) For the purposes of enforcement of this part, the following apply:

(1) Nothing in paragraph (a)(3) of this section is to be construed to require the use of manufacturer parts in maintaining or repairing a nonroad engine.

(2) Actions for the purpose of repair or replacement of a device or element of design or any other item are not considered prohibited acts under § 89.1003(a) if the action is a necessary and temporary procedure, the device or element is replaced upon completion of the procedure, and the action results in the proper functioning of the device or element of design.

(3) Actions for the purpose of a conversion of a nonroad engine for use of a clean alternative fuel (as defined in Title II of the Act) are not considered prohibited acts under § 89.1003(a) if:

(i) the vehicle complies with the applicable standard when operating on the alternative fuel, and the device or element is replaced upon completion of the conversion procedure, and

(ii) in the case of engines converted to dual fuel or flexible use, the action results in proper functioning of the device or element when the nonroad engine operates on conventional fuel.

(4) Certified nonroad engines shall be used in all vehicles and equipment manufactured on or after the applicable dates in §89.102-96(a) that are self-propelled, portable, transportable, or are intended to be propelled while performing their function unless the manufacturer of the vehicle or equipment can prove that the vehicle or equipment will be used in a manner consistent with paragraph (2) of the definition of nonroad engine in §89.2. Nonroad vehicle and equipment manufacturers may continue to use noncertified nonroad engines built prior to the effective date until noncertified engine inventories are depleted; however, stockpiling of noncertified nonroad engines will be considered a violation of this section.

(5) A manufacturer of nonroad vehicles may install an engine certified to the motor vehicle requirements of 40 CFR part 86 in a nonroad vehicle or equipment where:

(i) The subject nonroad vehicle or equipment is designed for travel on public streets and highways to get from one job site to another; and

(ii) The engine serves to propel the vehicle or equipment when it is operated on public roads; and

(iii) There is no adjustment outside of the manufacturer's specifications or removal or rendering inoperative of devices or elements of design installed on or in the engine by the original engine manufacturer for purposes of emission control or any other action that may be considered tampering under section 203 of the Clean Air Act or paragraph (a)(3) of this section; and

(iv) A certified nonroad engine is not available with appropriate physical or performance characteristics; or

(v) A state requires the use of an on-highway engine pursuant to a waiver granted by EPA under section 209(e) of the Clean Air Act.

(6) A manufacturer that produces nonroad vehicles or equipment by performing modifications to complete or incomplete motor vehicles may retain

the motor vehicle engine in such vehicle or equipment provided that:

(i) The engine is certified to the motor vehicle requirements of 40 CFR part 86; and

(ii) The on-highway vehicle is not available from its manufacturer with a certified nonroad engine having appropriate performance characteristics; and

(iii) There is no adjustment outside of the manufacturer's specifications or removal or rendering inoperative of devices or elements of design installed on or in the engine or vehicle by the original engine or vehicle manufacturer for purposes of emission control, or any other action that may be considered tampering under section 203 of the Clean Air Act or paragraph (a)(3) of this section.

(7) A new nonroad engine, intended solely to replace an engine in a piece of nonroad equipment manufactured prior to the applicable implementation date in §89.102-96(a), shall not be subject to the prohibitions of paragraph (a)(1) of this section or the requirements of §89.105-96 and paragraph (b)(4) of this section provided that:

(i) The engine manufacturer has ascertained that no engine produced by itself or the manufacturer of the engine that is being replaced, if different, and certified to the requirements of this subpart, is available with the appropriate physical or performance characteristics to repower the equipment; and

(ii) The engine manufacturer or its agent takes ownership and possession of the old engine in partial exchange for the replacement engine; and

(iii) The replacement engine is clearly labeled with the following language, or similar alternate language approved by the Administrator: THIS ENGINE DOES NOT COMPLY WITH FEDERAL NONROAD OR ON-HIGHWAY EMISSION REQUIREMENTS. SALE OR INSTALLATION OF THIS ENGINE FOR ANY PURPOSE OTHER THAN AS A REPLACEMENT ENGINE IN A NONROAD VEHICLE OR PIECE OF NONROAD EQUIPMENT BUILT BEFORE JANUARY 1, [INSERT APPROPRIATE YEAR] IS A VIOLATION OF

FEDERAL LAW SUBJECT TO CIVIL PENALTY.

[59 FR 31335, June 17, 1994, as amended at 61 FR 58106, Nov. 12, 1996]

§ 89.1004 General enforcement provisions.

(a) *Information collection provisions.* (1) Every manufacturer of new nonroad engines and other persons subject to the requirements of this part must establish and maintain records, perform tests where such testing is not otherwise reasonably available under this part, make reports and provide information the Administrator may reasonably require to determine whether the manufacturer or other person has acted or is acting in compliance with this part or to otherwise carry out the provisions of this part, and must, upon request of an officer or employee duly designated by the Administrator, permit the officer or employee at reasonable times to have access to and copy such records. The manufacturer shall comply in all respects with the requirements of subpart I of this part.

(2) For purposes of enforcement of this part, an officer or employee duly designated by the Administrator, upon presenting appropriate credentials, is authorized:

(i) To enter, at reasonable times, any establishment of the manufacturer, or of any person whom the manufacturer engaged to perform any activity required under paragraph (a) (1) of this section, for the purposes of inspecting or observing any activity conducted pursuant to paragraph (a)(1) of this section, and

(ii) To inspect records, files, papers, processes, controls, and facilities used in performing an activity required by paragraph (a)(1) of this section, by the manufacturer or by a person whom the manufacturer engaged to perform the activity.

(b) *Exemption provision.* The Administrator may exempt a new nonroad engine from § 89.1003 upon such terms and conditions as the Administrator may find necessary for the purpose of export, research, investigations, studies, demonstrations, or training, or for reasons of national security.

(c) *Importation provision.* (1) A new nonroad engine, vehicle, or equipment

offered for importation or imported by a person in violation of § 89.1003 is to be refused admission into the United States, but the Secretary of the Treasury and the Administrator may, by joint regulation, provide for deferring a final determination as to admission and authorizing the delivery of such a nonroad engine offered for import to the owner or consignee thereof upon such terms and conditions (including the furnishing of a bond) as may appear to them appropriate to insure that the nonroad engine will be brought into conformity with the standards, requirements, and limitations applicable to it under this part.

(2) If a nonroad engine is finally refused admission under this paragraph, the Secretary of the Treasury shall cause disposition thereof in accordance with the customs laws unless it is exported, under regulations prescribed by the Secretary, within 90 days of the date of notice of the refusal or additional time as may be permitted pursuant to the regulations.

(3) Disposition in accordance with the customs laws may not be made in such manner as may result, directly or indirectly, in the sale, to the ultimate consumer, of a new nonroad engine that fails to comply with applicable standards of the Administrator under this part.

(d) *Export provision.* A new nonroad engine intended solely for export, and so labeled or tagged on the outside of the container and on the engine itself, shall be subject to the provisions of § 89.1003, except that if the country that is to receive the engine has emission standards that differ from the standards prescribed under subpart B of this part, then the engine must comply with the standards of the country that is to receive the engine.

§ 89.1005 Injunction proceedings for prohibited acts.

(a) The district courts of the United States have jurisdiction to restrain violations of § 89.1003(a).

(b) Actions to restrain violations of § 89.1003(a) must be brought by and in the name of the United States. In an action, subpoenas for witnesses who are required to attend a district court

in any district may run into any other district.

§ 89.1006 Penalties.

(a) *Violations.* A violation of the requirements of this subpart is a violation of the applicable provisions of the Act, including sections 213(d) and 203, and is subject to the penalty provisions thereunder.

(1) A person who violates § 89.1003(a)(1), (a)(4), or (a)(6), or a manufacturer or dealer who violates § 89.1003(a)(3)(i), is subject to a civil penalty of not more than \$25,000 for each violation.

(2) A person other than a manufacturer or dealer who violates § 89.1003(a)(3)(i) or any person who violates § 89.1003(a)(3)(ii) is subject to a civil penalty of not more than \$2,500 for each violation.

(3) A violation with respect to § 89.1003 (a)(1), (a)(3)(i), (a)(4), or (a)(6) constitutes a separate offense with respect to each nonroad engine.

(4) A violation with respect to § 89.1003(a)(3)(ii) constitutes a separate offense with respect to each part or component. Each day of a violation with respect to § 89.1003(a)(5) constitutes a separate offense.

(5) A person who violates § 89.1003(a)(2) or (a)(5) is subject to a civil penalty of not more than \$25,000 per day of violation.

(b) *Civil actions.* The Administrator may commence a civil action to assess and recover any civil penalty under paragraph (a) of this section.

(1) An action under this paragraph may be brought in the district court of the United States for the district in which the defendant resides or has the Administrator's principal place of business, and the court has jurisdiction to assess a civil penalty.

(2) In determining the amount of a civil penalty to be assessed under this paragraph, the court is to take into account the gravity of the violation, the economic benefit or savings (if any) resulting from the violation, the size of the violator's business, the violator's history of compliance with Title II of the Act, action taken to remedy the violation, the effect of the penalty on the violator's ability to continue in

business, and such other matters as justice may require.

(3) In any such action, subpoenas for witnesses who are required to attend a district court in any district may run into any other district.

(c) *Administrative assessment of certain penalties—*(1) *Administrative penalty authority.* In lieu of commencing a civil action under paragraph (b) of this section, the Administrator may assess any civil penalty prescribed in paragraph (a) of this section, except that the maximum amount of penalty sought against each violator in a penalty assessment proceeding shall not exceed \$200,000, unless the Administrator and the Attorney General jointly determine that a matter involving a larger penalty amount is appropriate for administrative penalty assessment. Any such determination by the Administrator and the Attorney General is not subject to judicial review. Assessment of a civil penalty shall be by an order made on the record after opportunity for a hearing held in accordance with the procedures found at part 22 of this chapter. The Administrator may compromise, or remit, with or without conditions, any administrative penalty which may be imposed under this section.

(2) *Determining amount.* In determining the amount of any civil penalty assessed under this paragraph, the Administrator shall take into account the gravity of the violation, the economic benefit or savings (if any) resulting from the violation, the size of the violator's business, the violator's history of compliance with Title II of the Act, action taken to remedy the violation, the effect of the penalty on the violator's ability to continue in business, and such other matters as justice may require.

(3) *Effect of administrator's action.*

(i) Action by the Administrator under this paragraph does not affect or limit the Administrator's authority to enforce any provisions of the Act; except that any violation with respect to which the Administrator has commenced and is diligently prosecuting an action under this paragraph, or for which the Administrator has issued a final order not subject to further judicial review and for which the violator

has paid a penalty assessment under this paragraph shall not be the subject of a civil penalty action under paragraph (b) of this section.

(ii) No action by the Administrator under this paragraph shall affect a person's obligation to comply with a section of this part.

(4) *Finality of order.* An order issued under this subsection is to become final 30 days after its issuance unless a petition for judicial review is filed under paragraph (c)(5) of this section.

(5) *Judicial review.* A person against whom a civil penalty is assessed in accordance with this subsection may seek review of the assessment in the United States District Court for the District of Columbia or for the district in which the violation is alleged to have occurred, in which such person resides, or where the person's principal place of business is located, within the 30-day period beginning on the date a civil penalty order is issued. The person shall simultaneously send a copy of the filing by certified mail to the Administrator and the Attorney General. The Administrator shall file in the court within 30 days a certified copy, or certified index, as appropriate, of the record on which the order was issued. The court is not to set aside or remand any order issued in accordance with the requirements of this paragraph unless substantial evidence does not exist in the record, taken as a whole, to support the finding of a violation or unless the Administrator's assessment of the penalty constitutes an abuse of discretion, and the court is not to impose additional civil penalties unless the Administrator's assessment of the penalty constitutes an abuse of discretion. In any proceedings, the United States may seek to recover civil penalties assessed under this section.

(6) *Collection.* (i) If any person fails to pay an assessment of a civil penalty imposed by the Administrator as provided in this part after the order making the assessment has become final or after a court in an action brought under paragraph (c)(5) of this section has entered a final judgment in favor of the Administrator, the Administrator shall request that the Attorney General bring a civil action in an appropriate district court to recover the

amount assessed (plus interest at rates established pursuant to section 6621(a)(2) of the Internal Revenue Code of 1986 from the date of the final order or the date of final judgment, as the case may be). In such an action, the validity, amount, and appropriateness of the penalty is not subject to review.

(ii) A person who fails to pay on a timely basis the amount of an assessment of a civil penalty as described in paragraph (c)(6)(i) of this section shall be required to pay, in addition to that amount and interest, the United States' enforcement expenses, including attorney's fees and costs for collection proceedings, and a quarterly nonpayment penalty for each quarter during which the failure to pay persists. The nonpayment penalty is an amount equal to ten percent of the aggregate amount of that person's penalties and nonpayment penalties which are unpaid as of the beginning of such quarter.

§ 89.1007 Warranty provisions.

(a) The manufacturer of each nonroad engine must warrant to the ultimate purchaser and each subsequent purchaser that the engine is designed, built, and equipped so as to conform at the time of sale with applicable regulations under section 213 of the Act, and is free from defects in materials and workmanship which cause such engine to fail to conform with applicable regulations for its warranty period (as determined under § 89.104–96).

(b) In the case of a nonroad engine part, the manufacturer or rebuilder of the part may certify according to § 85.2112 that use of the part will not result in a failure of the engine to comply with emission standards promulgated in this part.

(c) For the purposes of this section, the owner of any nonroad engine warranted under this part is responsible for the proper maintenance of the engine. Proper maintenance includes replacement and service, at the owner's expense at a service establishment or facility of the owner's choosing, such items as spark plugs, points, condensers, and any other part, item, or device related to emission control (but not designed for emission control) under the terms of the last sentence of section

207(a)(3) of the Act, unless such part, item, or device is covered by any warranty not mandated by this Act.

§ 89.1008 In-use compliance provisions.

(a) Effective with respect to nonroad vehicles, equipment, and engines manufactured during model years 1996 and after:

(1) If the Administrator determines that a substantial number of any class or category of engines, although properly maintained and used, do not conform to the regulations prescribed under section 213 of the Act when in actual use throughout their recall period (as defined under § 89.104-96(b)), the Administrator shall immediately notify the manufacturer of such nonconformity and require the manufacturer to submit a plan for remedying the nonconformity of the engines with respect to which such notification is given.

(i) The manufacturer's plan shall provide that the nonconformity of any such engines which are properly used and maintained will be remedied at the expense of the manufacturer.

(ii) If the manufacturer disagrees with such determination of nonconformity and so advises the Administrator, the Administrator shall afford the manufacturer and other interested persons an opportunity to present their views and evidence in support thereof at a public hearing. Unless, as a result of such hearing, the Administrator withdraws such determination of nonconformity, the Administrator shall, within 60 days after the completion of such hearing, order the manufacturer to provide prompt notification of such nonconformity in accordance with paragraph (a)(2) of this section. The manufacturer shall comply in all respects with the requirements of subpart G of this part.

(2) Any notification required to be given by the manufacturer under paragraph (a)(1) of this section with respect to any class or category of engines shall be given to dealers, ultimate purchasers, and subsequent purchasers (if known) in such manner and containing such information as required in subparts H and I of this part.

(3)(i) The manufacturer shall furnish with each new nonroad engine written instructions for the proper maintenance

and use of the engine by the ultimate purchaser as required under § 89.109-96. The manufacturer shall provide in boldface type on the first page of the written maintenance instructions notice that maintenance, replacement, or repair of the emission control devices and systems may be performed by any nonroad engine repair establishment or individual using any nonroad engine part which has been certified as provided in § 89.1007(a).

(ii) The instruction under paragraph (3)(i) of this section must not include any condition on the ultimate purchaser's using, in connection with such engine, any component or service (other than a component or service provided without charge under the terms of the purchase agreement) which is identified by brand, trade, or corporate name. Subject instructions also must not directly or indirectly distinguish between service performed by the franchised dealers of such manufacturer, or any other service establishments with which such manufacturer has a commercial relationship, and service performed by independent nonroad engine repair facilities with which such manufacturer has no commercial relationship.

(iii) The prohibition of paragraph (a)(3)(ii) of this section may be waived by the Administrator if:

(A) The manufacturer satisfies the Administrator that the engine will function properly only if the component or service so identified is used in connection with such engine, and

(B) The Administrator finds that such a waiver is in the public interest.

(iv) In addition, the manufacturer shall indicate by means of a label or tag permanently affixed to the engine that the engine is covered by a certificate of conformity issued for the purpose of assuring achievement of emission standards prescribed under section 213 of the Act. This label or tag shall also contain information relating to control of emissions as prescribed under § 89.110-96.

(b) The manufacturer bears all cost obligation a dealer incurs as a result of a requirement imposed by paragraph (a) of this section. The transfer of any

such cost obligation from a manufacturer to a dealer through franchise or other agreement is prohibited.

(c) If a manufacturer includes in an advertisement a statement respecting the cost or value of emission control devices or systems, the manufacturer shall set forth in the statement the cost or value attributed to these devices or systems by the Secretary of Labor (through the Bureau of Labor Statistics). The Secretary of Labor, and his or her representatives, has the same access for this purpose to the books, documents, papers, and records of a manufacturer as the Comptroller General has to those of a recipient of assistance for purposes of section 311 of the Act.

(d) Any inspection of a nonroad engine for purposes of paragraph (a)(1) of this section, after its sale to the ultimate purchaser, is to be made only if the owner of such vehicle or engine voluntarily permits such inspection to be made, except as may be provided by any state or local inspection program.

PART 90—CONTROL OF EMISSIONS FROM NONROAD SPARK-IGNITION ENGINES

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