

The EPA Administrator signed the following final rule on September 13, 2002. It is being submitted for publication in the *Federal Register*. While EPA has taken steps to ensure the accuracy of this Internet version, it is not the official version of the rule. Please refer to the official version in a forthcoming *Federal Register* publication and on GPO's Web Site. The rule will likely be published in the *Federal Register* by October 11, 2002. You can access the *Federal Register* at: http://www.access.gpo.gov/su_docs/aces/aces140.html. When using this site, note that "text" files may be incomplete because they don't include graphics. Instead, select "Adobe Portable Document File" (PDF) files.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is proposed to be amended as set forth below.

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

1. The authority for part 89 continues to read as follows:

Authority: 42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7545, 7547, 7549, 7550, and 7601(a).

Subpart A—[Amended]

2. Section 89.2 is amended by adding definitions for “Aircraft”, “Spark-ignition”, and “United States” in alphabetic order and revising the definition of “Compression-ignition” to read as follows:

§89.2 Definitions.

* * * * *

Aircraft means any vehicle capable of sustained air travel above treetop heights.

* * * * *

Compression-ignition means relating to a type of reciprocating, internal-combustion engine that is not a spark-ignition engine.

* * * * *

Spark-ignition means relating to a gasoline-fueled engine or other engines with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

* * * * *

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

* * * * *

Subpart B—[Amended]

3. Section 89.106 is amended by revising paragraph (b) read as follows:

§89.106 Prohibited controls.

* * * * *

(b) You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

PART 90—CONTROL OF EMISSIONS FROM NONROAD SPARK-IGNITION ENGINES AT OR BELOW 19 KILOWATTS

4. The heading to part 90 is revised to read as set forth above.

5. The authority for part 90 continues to read as follows:

Authority: 42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7547, 7549, 7550, and 7601(a).

Subpart A—[Amended]

6. Section 90.1 is revised to read as follows:

§90.1 Applicability.

(a) This part applies to new nonroad spark-ignition engines and vehicles with gross power output at or below 19 kilowatts (kW) used for any purpose, unless we exclude them under paragraph (d) of this section.

(b) This part also applies to engines with a gross power output above 19 kW if the manufacturer uses the provisions of 40 CFR 1048.615 or 1051.145(a)(3) to exempt them from the requirements of 40 CFR part 1048 or 1051, respectively. Compliance with the provisions of this part is a required condition of those exemptions.

(c) [Reserved]

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

(1) Engines certified to meet the requirements of 40 CFR part 1051 (e.g, engines used in snowmobiles). This part nevertheless applies to engines used in recreational vehicles if the manufacturer uses the provisions of 40 CFR 1051.145(a)(3) to exempt them from the requirements of 40 CFR part 1051. Compliance with the provisions of this part is a required condition of that exemption.

(2) Engines used in highway motorcycles. See 40 CFR part 86, subpart E.

(3) Propulsion marine engines. See 40 CFR part 91. This part applies with respect to auxiliary marine engines.

(4) Engines used in aircraft. See 40 CFR part 87.

(5) Engines certified to meet the requirements of 40 CFR part 1048.

(6) Hobby engines.

(7) Engines that are used exclusively in emergency and rescue equipment where no certified engines are available to power the equipment safely and practically, but not including generators, alternators, compressors or pumps used to provide remote power to a rescue tool. The equipment manufacturer bears the responsibility to ascertain on an annual basis and maintain documentation available to the Administrator that no appropriate certified engine is available from any source.

(e) Engines subject to the provisions of this subpart are also subject to the provisions found in subparts B through N of this part, except that subparts C, H, M and N of this part apply only to Phase 2 engines as defined in this subpart.

(f) Certain text in this part is identified as pertaining to Phase 1 or Phase 2 engines. Such text pertains only to engines of the specified Phase. If no indication of Phase is given, the text pertains to all engines, regardless of Phase.

7. Section 90.2 is amended by adding a new paragraph (c) to read as follows:

§90.2 Effective dates.

* * * * *

(c) Notwithstanding paragraphs (a) and (b) of this section, engines used in recreational vehicles with engine rated speed greater than or equal to 5,000 rpm and with no installed speed governor are not subject to the provisions of this part through the 2005 model year. Starting with the 2006 model year, all the requirements of this part apply to engines used in these vehicles if they are not included in the scope of 40 CFR part 1051.

8. Section 90.3 is amended by adding definitions for “Aircraft”, “Hobby engines”, “Marine engine”, “Marine vessel”, “Recreational”, and “United States” in alphabetical order, to read as follows:

§90.3 Definitions.

* * * * *

Aircraft means any vehicle capable of sustained air travel above treetop heights.

* * * * *

Hobby engines means engines used in reduced-scale models of vehicles that are not capable of transporting a person (for example, model airplanes).

Marine engine means an engine that someone installs or intends to install on a marine vessel. There are two kinds of marine engines:

(1) Propulsion marine engine means a marine engine that moves a vessel through the water or directs the vessel’s movement.

(2) Auxiliary marine engine means a marine engine not used for propulsion.

Marine vessel means a vehicle that is capable of operation in water but is not capable of operation out of water. Amphibious vehicles are not marine vessels.

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Recreational means, for purposes of this part, relating to a vehicle intended by the vehicle manufacturer to be operated primarily for pleasure.

* * * * *

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

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Subpart B—[Amended]

9. Section 90.103 is amended by redesignating paragraph (a)(2)(v) as paragraph (a)(2)(vi) and adding a new paragraph (a)(2)(v) to read as follows:

§90.103 Exhaust emission standards.

(a) * * *

(2) * * *

(v) The engine must be used in a recreational application, with a combined total vehicle dry weight under 20 kilograms;

* * * * *

10. Section 90.110 is amended by revising paragraph (b) read as follows:

§90.110 Requirement of certification—prohibited controls.

* * * * *

(b) You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

PART 91—CONTROL OF EMISSIONS FROM MARINE SPARK-IGNITION ENGINES

11. The authority for part 91 continues to read as follows:

Authority: 42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7547, 7549, 7550, and 7601(a).

Subpart A—[Amended]

12. Section 91.3 is amended by adding the definition for “United States” in alphabetical order to read as follows:

§91.3 Definitions.

* * * * *

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

* * * * *

Subpart B—[Amended]

13. Section 91.110 is amended by revising paragraph (b) read as follows:

§91.110 Requirement of certification—prohibited controls.

* * * * *

(b) You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

Subpart E—[Amended]

14. Section 91.419 is amended in paragraph (b) by revising the equations for $M_{HC_{exh}}$ and M_{exh} to read as follows:

§91.419 Raw emission sampling calculations.

* * * * *

(b) * * *

$$M_{HC_{exh}} = 12.01 + 1.008 \times \alpha$$

* * * * *

$$M_{exh} = \frac{M_{HC_{exh}} \times WHC}{10^6} + \frac{28.01 \times WCO}{10^2} + \frac{44.1 \times WCO_2}{10^2} +$$

$$\frac{46.01 \times WNO_x}{10^6} + \frac{2.016 \times WH_2}{10^2} + 18.01 \times (1 - K) +$$

$$28.01 \times \left[\frac{100 - \frac{WHC}{10^4} - WCO - WCO_2 - \frac{WNO_x}{10^4} - WH_2 - 100 \times (1 - K)}{10^2} \right]$$

* * * * *

Subpart G—[Amended]

15. Appendix A to Subpart G of part 91 is amended by revising Table 1 to read as follows:

Appendix A to Subpart G of Part 91—Sampling Plans for Selective Enforcement Auditing of Marine Engines

Table 1—

Sampling Plan Code Letter

Annual engine family sales	Code letter
20 - 50	AA ¹
20 - 99	A ¹
100 - 299	B
300 - 499	C
500 or greater	D

¹ A 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 manufacturers may switch between these plans during the audit.

* * * * *

Subpart I—[Amended]

16. Section 91.803 is amended by revising paragraph (a) to read as follows:

§91.803 Manufacturer in-use testing program.

(a) EPA shall annually identify engine families and those configurations within families which the manufacturers must then subject to in-use testing. For each model year, EPA may identify the following number of engine families for testing, based on the number of the manufacturer’s engine families to which this subpart is applicable produced in that model year:

- (1) For manufactures with three or fewer engine families, EPA may identify a single engine family.

(2) For manufacturers with four or more engine families, EPA may identify a number of engine families that is no greater than twenty-five percent of the number of engine families to which this subpart is applicable that are produced by the manufacturer in that model year.

* * * * *

PART 94—CONTROL OF EMISSIONS FROM MARINE COMPRESSION-IGNITION ENGINES

17. The heading to part 94 is revised to read as set forth above.

18. The authority citation for part 94 continues to read as follows:

Authority: 42 U.S.C. 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7545, 7547, 7549, 7550 and 7601(a).

Subpart A—[Amended]

19. Section 94.1 is revised to read as follows:

§94.1 Applicability.

(a) Except as noted in paragraphs (b) and (c) of this section, the provisions of this part apply to manufacturers (including post-manufacture marinizers and dressers), rebuilders, owners and operators of:

(1) Marine engines that are compression-ignition engines manufactured (or that otherwise become new) on or after January 1, 2004;

(2) Marine vessels manufactured (or that otherwise become new) on or after January 1, 2004 and which include a compression-ignition marine engine.

(b) Notwithstanding the provision of paragraph (c) of this section, the requirements and prohibitions of this part do not apply to three types of marine engines:

(1) Category 3 marine engines;

(2) Marine engines with rated power below 37 kW; or

(3) Marine engines on foreign vessels.

(c) The provisions of Subpart L of this part apply to everyone with respect to the engines identified in paragraph (a) of this section.

20. Section 94.2 is amended by revising paragraph (b) introductory text, removing the definition for “Commercial marine engine”, revising definitions for “Compression-ignition”, “Designated officer”, “Passenger”, “Recreational marine engine”, “Recreational vessel”, and “United States”, and adding new definitions for “Commercial”, “Small-volume boat builder”, “Small-volume manufacturer”, and “Spark-ignition” in alphabetical order to read as follows:

§94.2 Definitions.

* * * * *

(b) As used in this part, all terms not defined in this section shall have the meaning given them in the Act:

* * * * *

Commercial means relating to an engine or vessel that is not a recreational marine engine or a recreational vessel.

* * * * *

Compression-ignition means relating to an engine that is not a spark-ignition engine.

* * * * *

Designated Officer means the Manager, Engine Programs Group (6403-J), U.S. Environmental Protection

Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

* * * * *

Passenger has the meaning given by 46 U.S.C. 2101 (21) and (21a). In the context of commercial vessels, this generally means that a passenger is a person that pays to be on the vessel.

* * * * *

Recreational marine engine means a Category 1 propulsion marine engine that is intended by the manufacturer to be installed on a recreational vessel, and which is permanently labeled as follows: "THIS ENGINE IS CATEGORIZED AS A RECREATIONAL MARINE ENGINE UNDER 40 CFR PART 94. INSTALLATION OF THIS ENGINE IN ANY NONRECREATIONAL VESSEL IS A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.".

Recreational vessel has the meaning given in 46 U.S.C. 2101 (25), but excludes "passenger vessels" and "small passenger vessels" as defined by 46 U.S.C. 2101 (22) and (35) and excludes vessels used solely for competition. In general, for this part, "recreational vessel" means a vessel that is intended by the vessel manufacturer to be operated primarily for pleasure or leased, rented or chartered to another for the latter's pleasure, excluding the following vessels:

- (1) Vessels of less than 100 gross tons that carry more than 6 passengers (as defined in this section).
- (2) Vessels of 100 gross tons or more that carry one or more passengers (as defined in this section).
- (3) Vessels used solely for competition.

* * * * *

Small-volume boat builder means a boat manufacturer with fewer than 500 employees and with annual U.S.-directed production of fewer than 100 boats. For manufacturers owned by a parent company, these limits apply to the combined production and number of employees of the parent company and all its subsidiaries.

Small-volume manufacturer means a manufacturer with annual U.S.-directed production of fewer than 1,000 internal combustion engines (marine and nonmarine). For manufacturers owned by a parent company, the limit applies to the production of the parent company and all its subsidiaries.

Spark-ignition means relating to a gasoline-fueled engine or other engines with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

* * * * *

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

* * * * *

21. Section 94.7 is amended by revising paragraphs (c), (d), and (e) to read as follows:

§94.7 General standards and requirements.

* * * * *

(c) You may not design your engines with emission-control devices, systems, or elements of design that cause or

contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

(d) All engines subject to the emission standards of this part shall be equipped with a connection in the engine exhaust system that is located downstream of the engine and before any point at which the exhaust contacts water (or any other cooling/scrubbing medium) for the temporary attachment of gaseous and/or particulate emission sampling equipment. This connection shall be internally threaded with standard pipe threads of a size not larger than one-half inch, and shall be closed by a pipe-plug when not in use. Equivalent connections are allowed. Engine manufacturers may comply with this requirement by providing vessel manufacturers with clear instructions explaining how to meet this requirement, and noting in the instructions that failure to comply may invalidate a certificate and subject the vessel manufacturer to federal penalties.

(e) Electronically controlled engines subject to the emission standards of this part shall broadcast on engine's controller area networks engine torque (as percent of maximum torque at that speed) and engine speed.

22. Section 94.8 is amended by revising paragraphs (a), (e), (f) introductory text, and (f)(1) to read as follows:

§94.8 Exhaust emission standards.

(a) Exhaust emissions from marine compression-ignition engines shall not exceed the applicable exhaust emission standards contained in Table A-1 as follows:

Table A-1– Primary Tier 2 Exhaust Emission Standards (g/kW-hr)

Engine Size liters/cylinder, rated power	Category	Model Year ^a	THC+NOx g/kW-hr	CO g/kW-hr	PM g/kW-hr
disp. < 0.9 and power ≥ 37 kW	Category 1 Commercial	2005	7.5	5.0	0.40
	Category 1 Recreational	2007	7.5	5.0	0.40
0.9 ≤ disp. < 1.2 all power levels	Category 1 Commercial	2004	7.2	5.0	0.30
	Category 1 Recreational	2006	7.2	5.0	0.30
1.2 ≤ disp. < 2.5 all power levels	Category 1 Commercial	2004	7.2	5.0	0.20
	Category 1 Recreational	2006	7.2	5.0	0.20
2.5 ≤ disp. < 5.0 all power levels	Category 1 Commercial	2007	7.2	5.0	0.20
	Category 1 Recreational	2009	7.2	5.0	0.20
5.0 ≤ disp. < 15.0 all power levels	Category 2	2007	7.8	5.0	0.27
15.0 ≤ disp. < 20.0 power < 3300 kW	Category 2	2007	8.7	5.0	0.50
15.0 ≤ disp. < 20.0 power ≥ 3300 kW	Category 2	2007	9.8	5.0	0.50
20.0 ≤ disp. < 25.0 all power levels	Category 2	2009	9.8	5.0	0.50
25.0 ≤ disp. < 30.0 all power levels	Category 2	2007	11.0	5.0	0.50

^a The dates listed indicate the model years for which the specified standards start.

* * * * *

(e) Exhaust emissions from propulsion engines subject to the standards (or FELs) in paragraph (a), (c), or (f) of this section shall not exceed:

(1) Commercial marine engines. (i) 1.20 times the applicable standards (or FELs) when tested in accordance with the supplemental test procedures specified in §94.106 at loads greater than or equal to 45 percent of the maximum power at rated speed or 1.50 times the applicable standards (or FELs) at loads less than 45 percent of the maximum power at rated speed.

(ii) As an option, the manufacturer may choose to comply with limits of 1.25 times the applicable standards (or FELs) when tested over the whole power range in accordance with the supplemental test procedures

specified in §94.106, instead of the limits in paragraph (e)(1)(i) of this section.

(2) Recreational marine engines. (i) 1.20 times the applicable standards (or FELs) when tested in accordance with the supplemental test procedures specified in §94.106 at loads greater than or equal to 45 percent of the maximum power at rated speed and speeds less than 95 percent of maximum test speed, or 1.50 times the applicable standards (or FELs) at loads less than 45 percent of the maximum power at rated speed, or 1.50 times the applicable standards (or FELs) at any loads for speeds greater than or equal to 95 percent of the maximum test speed.

(ii) As an option, the manufacturer may choose to comply with limits of 1.25 times the applicable standards (or FELs) when tested over the whole power range in accordance with the supplemental test procedures specified in §94.106, instead of the limits in paragraph (e)(2)(i) of this section.

(f) The following defines the requirements for low-emitting Blue Sky Series engines:

(1) Voluntary standards. Engines may be designated “Blue Sky Series” engines through the 2012 model year by meeting the voluntary standards listed in Table A-2, which apply to all certification and in-use testing, as follows:

Table A-2.—Voluntary Emission Standards (g/kW-hr)

Rated Brake Power (kW)	THC+NOx	PM
power \geq 37 kW, and displ.<0.9	4.0	0.24
0.9 \leq displ.<1.2	4.0	0.18
1.2 \leq displ.<2.5	4.0	0.12
2.5 \leq displ.<5	5.0	0.12
5 \leq displ.<15	5.0	0.16
15 \leq disp. < 20, and power < 3300 kW	5.2	0.30
15 \leq disp. < 20, and power \geq 3300 kW	5.9	0.30
20 \leq disp. < 25	5.9	0.30
25 \leq disp. < 30	6.6	0.30

* * * * *

23. Section 94.9 is amended by revising paragraphs (a) introductory text and (a)(1) to read as follows:

§94.9 Compliance with emission standards.

(a) The general standards and requirements in §94.7 and the emission standards in §94.8 apply to each new engine throughout its useful life period. The useful life is specified both in years and in hours of operation, and ends when either of the values (hours of operation or years) is exceeded.

- (1) The minimum useful life is:
 - (i) 10 years or 1,000 hours of operation for recreational Category 1 engines;
 - (ii) 10 years or 10,000 hours of operation for commercial Category 1 engines;
 - (iii) 10 years or 20,000 hours of operation for Category 2 engines.

* * * * *

24. Section 94.12 is amended by revising the introductory text and paragraphs (a), (b)(1), and (e) and adding a new paragraphs (f) and (g) to read as follows:

§94.12 Interim provisions.

This section contains provisions that apply for a limited number of calendar years or model years. These provisions apply instead of the other provisions of this part.

(a) Compliance date of standards. Certain companies may delay compliance with emission standards. Companies wishing to take advantage of this provision must inform the Designated Officer of their intent to do so in writing before the date that compliance with the standards would otherwise be mandatory.

(1) Post-manufacture marinizers may elect to delay the model year of the Tier 2 standards for commercial engines as specified in §94.8 by one year for each engine family.

(2) Small-volume manufacturers may elect to delay the model year of the Tier 2 standards for recreational engines as specified in §94.8 by five years for each engine family.

(b) Early banking of emission credits. (1) A manufacturer may optionally certify engines manufactured before the date the Tier 2 standards take effect 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. Manufacturers may begin earning credits for recreational engines on **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**.

* * * * *

(e) Compliance date of NTE requirements (1) Notwithstanding the other provisions of this part, the requirements of §94.8(e) for commercial marine engines start with 2010 model year engines for post-manufacture marinizers and 2007 model year engines for all other engine manufacturers.

(2) Notwithstanding the other provisions of this part, the requirements of §94.8(e) for recreational marine engines start with 2012 model year engines for post-manufacture marinizers and 2009 model year engines for all other engine manufacturers.

(f) Flexibility for small-volume boat builders. Notwithstanding the other provisions of this part, manufacturers may sell uncertified recreational engines to small-volume boat builders during the first five years for which the emission standards in §94.8 apply, subject to the following provisions:

(1) The U.S.-directed production volume of boats from any small-volume boat builder using uncertified engines during the total five-year period may not exceed 80 percent of the manufacturer's average annual production for the three years prior to the general applicability of the recreational engine standards in §94.8, except as allowed in paragraph (f)(2) of this section.

(2) Small-volume boat builders may exceed the production limits in paragraph (f)(1) of this section, provided they do not exceed 20 boats during the five-year period or 10 boats in any single calendar year. This does not

apply to boats powered by engines with displacement greater than 2.5 liters per cylinder.

(3) Small-volume boat builders must keep records of all the boats and engines produced under this paragraph (f), including boat and engine model numbers, serial numbers, and dates of manufacture. Records must also include information verifying compliance with the limits in paragraph (f)(1) or (f)(2) of this section. Keep these records until at least two full years after you no longer use the provisions in this paragraph (f).

(4) Manufacturers must add a permanent, legible label, written in block letters in English, to a readily visible part of each engine exempted under this paragraph (f). This label must include at least the following items:

- (1) The label heading "EMISSION CONTROL INFORMATION".
- (2) Your corporate name and trademark.
- (3) Engine displacement (in liters), rated power, and model year of the engine or whom to contact for further information.
- (4) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 94.12(f) FROM EMISSION STANDARDS AND RELATED REQUIREMENTS."

(g) Flexibility for engines over 560kW. Notwithstanding the other provisions of this part, manufacturers may choose to delay certification of marine engines with less than 2.5 liters per cylinder and rated power above 560 kW, that are derived from a land-based nonroad engine with a rated power greater than 560 kW, if they do all of the following:

- (1) Certify all of their applicable marine engines with less than 2.5 liters per cylinder and rated power above 560 kW to a NO_x standard of 6.4 g/kW-hr for model years 2008 through 2012.
- (2) Notify EPA in writing before 2004 of their intent to use this provision. This notification must include a signed statement certifying that the manufacturer will comply with all the provisions of this paragraph (g).
- (3) Add a permanent, legible label, written in block letters in English, to a readily visible part of each engine exempted under this paragraph (f). This label must include at least the following items:
 - (i) The label heading "EMISSION CONTROL INFORMATION".
 - (ii) Your corporate name and trademark.
 - (iii) Engine displacement (in liters), rated power, and model year of the engine or whom to contact for further information.
 - (iv) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 94.12(g) FROM EMISSION STANDARDS AND RELATED REQUIREMENTS."

Subpart B—[Amended]

25. Section 94.104 is amended by redesignating paragraph (c) as paragraph (d) and adding a new paragraph (c) to read as follows:

§94.104 Test procedures for Category 2 marine engines.

* * * * *

(c) Conduct testing at ambient temperatures from 13° C to 30° C.

* * * * *

26. Section 94.105 is amended by revising paragraph (b) text preceding Table B-1, revising “#” to read “±” in footnotes 1 and 2 in the tables in paragraphs (b), (c)(1), (c)(2), and (d)(1), and adding a new paragraph (e) to read as follows:

§ 94.105 Duty cycles.

* * * * *

(b) General cycle. Propulsion engines that are used with (or intended to be used with) fixed-pitch propellers, and any other engines for which the other duty cycles of this section do not apply, shall be tested using the duty cycle described in the following Table B-1:

* * * * *

(e) Recreational. For the purpose of determining compliance with the emission standards of §94.8, recreational engines shall be tested using the duty cycle described in Table B-5, which follows:

Table B-5.—Recreational Marine Duty Cycle

Mode Number	Engine Speed ⁽¹⁾ (percent of maximum test speed)	Percent of Maximum Test Power ⁽²⁾	Minimum Time in mode (minutes)	Weighting Factors
1	100	100	5.0	0.08
2	91	75	5.0	0.13
3	80	50	5.0	0.17
4	63	25	5.0	0.32
5	idle	0	5.0	0.30

¹Engine speed: ± 2 percent of point.

²Power: ±2 percent of engine maximum value.

27. Section 94.106 is amended by revising paragraphs (b) introductory text, (b)(1) introductory text, (b)(2)

introductory text, (b)(3) introductory text, and (b)(4) and adding a new paragraph (b)(5) to read as follows:

§ 94.106 Supplemental test procedures.

* * * * *

(b) The specified Not to Exceed Zones for marine engines are defined as follows. These Not to Exceed Zones apply, unless a modified zone is established under paragraph (c) of this section.

(1) For commercial Category 1 engines certified using the duty cycle specified in §94.105(b), the Not to Exceed zones are defined as follows:

* * * * *

(2) For Category 2 engines certified using the duty cycle specified in §94.105(b), the Not to Exceed zones are defined as follows:

* * * * *

(3) For engines certified using the duty cycle specified in §94.105(c)(2), the Not to Exceed zones are defined as follows:

* * * * *

(4) For engines certified using the duty cycle specified in §94.105(c)(1), the Not to Exceed zone is defined as any load greater than or equal to 25 percent of maximum power at rated speed, and any speed at which the engine operates in use.

(5) For recreational marine engines certified using the duty cycle specified in §94.105(e), the Not to Exceed zones are defined as follows:

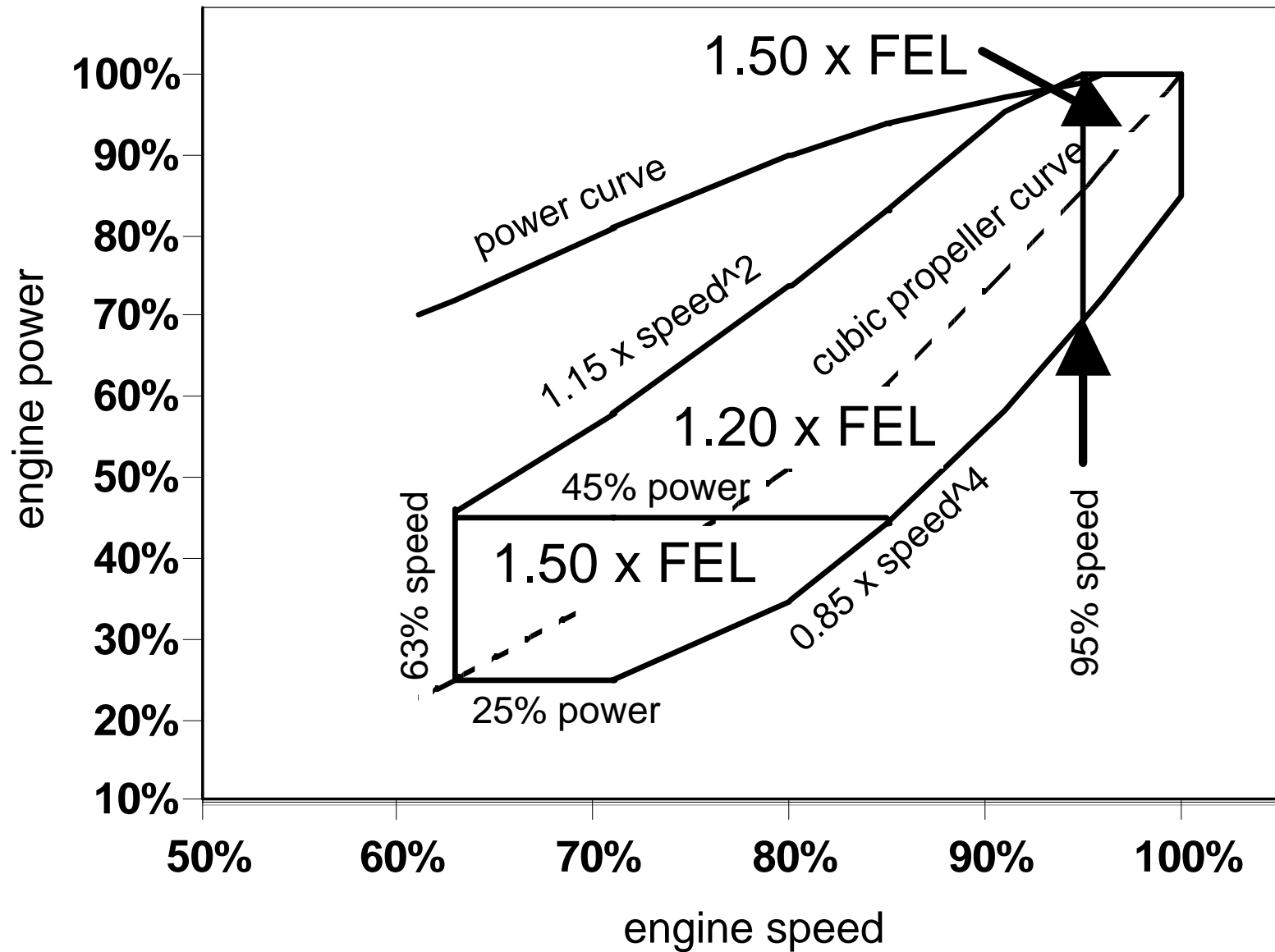
(i) The Not to Exceed zone is the region between the curves $\text{power} = 1.15 \times \text{SPD}^2$ and $\text{power} = 0.85 \times \text{SPD}^4$, excluding all operation below 25% of maximum power at rated speed and excluding all operation below 63% of maximum test speed.

(ii) This zone is divided into three subzones, one below 45% of maximum power at maximum test speed; one above 95% of maximum test speed; and a third area including all of the remaining area of the NTE zone.

(iii) SPD in paragraph (b)(5)(i) of this section refers to percent of maximum test speed.

(iv) See Figure B-4 for an illustration of this Not to Exceed zone as follows:

Figure B-4



28. Section 94.108 is amended in paragraph (a)(1) by revising footnote 1 in Table B-5 to read as follows:

§ 94.108 Test fuels.

(a) * * * (1) * * *

Table B-5—Federal Test Fuel Specifications

* * * * *

¹All ASTM procedures in this table have been incorporated by reference. See §94.5.

* * * * *

* * * * *

Subpart C—[Amended]

29. Section 94.203 is amended by revising paragraphs (d)(14) and (d)(16) to read as follows:

§94.203 Application for certification.

* * * * *

(d) * * *

(14) A statement that all the engines included in the engine family comply with the Not To Exceed standards specified in §94.8(e) when operated under all conditions which may reasonably be expected to be encountered in normal operation and use; the manufacturer also must provide a detailed description of all testing, engineering analyses, and other information which provides the basis for this statement.

* * * * *

(16) A statement indicating duty-cycle and application of the engine (e.g., used to propel planing vessels, use to propel vessels with variable-pitch propellers, constant-speed auxiliary, recreational, etc.).

* * * * *

30. Section 94.204 is amended by removing “and” at the end of paragraph (b)(9), adding “; and” at the end of paragraph (b)(10), adding a new paragraph (b)(11), and revising paragraph (e) to read as follows:

§94.204 Designation of engine families.

* * * * *

(b) * * *

(11) Class (commercial or recreational).

* * * * *

(e) Upon request by the manufacturer, the Administrator may allow engines that would be required to be grouped into separate engine families based on the criteria in paragraph (b) or (c) of this section to be grouped into a single engine family if the manufacturer demonstrates that the engines will have similar emission characteristics; however, recreational and commercial engines may not be grouped in the same engine family. This request must be accompanied by emission information supporting the appropriateness of such combined engine families.

31. Section 94.209 is revised to read as follows:

§94.209 Special provisions for post-manufacture marinizers and small-volume manufacturers.

(a) Broader engine families. Instead of the requirements of §94.204, an engine family may consist of any engines subject to the same emission standards. This does not change any of the requirements of this part for showing that an engine family meets emission standards. To be eligible to use the provisions of this paragraph (a), the manufacturer must demonstrate one of the following:

(1) It is a post-manufacture marinizer and that the base engines used for modification have a valid certificate of conformity issued under 40 CFR part 89 or 40 CFR part 92 or the heavy-duty engine provisions of 40 CFR part 86.

(2) It is a small-volume manufacturer.

(b) Hardship relief. Post-manufacture marinizers, small-volume manufacturers, and small-volume boat builders may take any of the otherwise prohibited actions identified in §94.1103(a)(1) if approved in advance by the Administrator, subject to the following requirements:

(1) Application for relief must be submitted to the Designated Officer in writing prior to the earliest date in which the applying manufacturer would be in violation of §94.1103. The manufacturer must submit evidence showing that the requirements for approval have been met.

(2) The conditions causing the impending violation must not be substantially the fault of the applying manufacturer.

(3) The conditions causing the impending violation must jeopardize the solvency of the applying manufacturer if relief is not granted.

(4) The applying manufacturer must demonstrate that no other allowances under this part will be available to avoid the impending violation.

(5) Any relief may not exceed one year beyond the date relief is granted.

(6) The Administrator may impose other conditions on the granting of relief including provisions to recover the lost environmental benefit.

(3) The manufacturer must add a permanent, legible label, written in block letters in English, to a readily visible part of each engine exempted under this paragraph (f). This label must include at least the following items:

(i) The label heading "EMISSION CONTROL INFORMATION".

(ii) Your corporate name and trademark.

(iii) Engine displacement (in liters), rated power, and model year of the engine or whom to contact for further information.

(iv) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 94.209(b) FROM EMISSION STANDARDS AND RELATED REQUIREMENTS."

(c) Extension of deadlines. Small-volume manufacturers may use the provisions of 40 CFR 1068.250 to ask for an extension of a deadline to meet emission standards. We may require that you use available base engines that have been certified to emission standards for land-based engines until you are able to produce engines certified to the requirements of this part.

32. Section 94.212 is amended by revising paragraph (b)(10) to read as follows:

§94.212 Labeling.

* * * * *

(b) Engine labels. * * *

(10) The application for which the engine family is certified. (For example: constant-speed auxiliary, variable-speed propulsion engines used with fixed-pitch propellers, recreational , etc.)

* * * * *

33. Section 94.218 is amended by adding a new paragraph (d)(2)(iv) to read as follows:

§94.218 Deterioration factor determination.

* * * * *

(d) * * *

(2) * * *

(iv) Assigned deterioration factors. Small-volume manufacturers may use deterioration factors established by EPA.

Subpart D—[Amended]

34. Section 94.304 is amended by revising paragraph (k) to read as follows:

§94.304 Compliance requirements.

* * * * *

(k) The following provisions limit credit exchanges between different types of engines:

(1) Credits generated by Category 1 engine families may be used for compliance by Category 1 or Category 2 engine families. Credits generated from Category 1 engine families for use by Category 2 engine families must be discounted by 25 percent.

(2) Credits generated by Category 2 engine families may be used for compliance only by Category 2 engine families.

(3) Credits may not be exchanged between recreational and commercial engines.

* * * * *

Subpart F—[Amended]

35. Section 94.501 is amended by revising paragraph (a) to read as follows:

§94.501 Applicability.

(a) The requirements of this subpart are applicable to manufacturers of engines subject to the provisions of Subpart A of this part, excluding small-volume manufacturers.

* * * * *

36. Section 94.503 is amended by adding a new paragraph (d) to read as follows:

§94.503 General requirements.

* * * * *

(d) If you certify an engine family with carryover emission data, as described in §94.206(c), and these equivalent engine families consistently pass the production-line testing requirements over the preceding two-year period, you may ask for a reduced testing rate for further production-line testing for that family. The minimum testing rate is one engine per engine family. If we reduce your testing rate, we may limit our approval to any number of model years. In determining whether to approve your request, we may consider the number of engines that have failed the emission tests.

Subpart J—[Amended]

37. Section 94.907 is amended by revising paragraphs (d) and (g) to read as follows:

§94.907 Engine dressing exemption.

* * * * *

(d) New marine engines that meet all the following criteria are exempt under this section:

(1) You must produce it by marinizing an engine covered by a valid certificate of conformity from one of the following programs:

- (i) Heavy-duty highway engines (40 CFR part 86).
- (ii) Land-based nonroad diesel engines (40 CFR part 89).
- (iii) Locomotive engines (40 CFR part 92).

(2) The engine must have the label required under 40 CFR part 86, 89, or 92.

(3) You must not make any changes to the certified engine that could reasonably be expected to increase its emissions. For example, if you make any of the following changes to one of these engines, you do not qualify for the engine dressing exemption:

- (i) Changing any fuel system parameters from the certified configuration.
- (ii) Replacing an original turbocharger, except that small-volume manufacturers of recreational engines may replace an original turbocharger with one that matches the performance of the original turbocharger.
- (iii) Modify or design the marine engine cooling or aftercooling system so that temperatures or heat

rejection rates are outside the original engine manufacturer's specified ranges.

(4) You must make sure that fewer than 50 percent of the engine model's total sales, from all companies, are used in marine applications.

* * * * *

(g) If your engines do not meet the criteria listed in paragraphs (d)(2) through (d)(4) of this section, they will be subject to the standards and prohibitions of this part. Marinization without a valid exemption or certificate of conformity would be a violation of §94.1103(a)(1) and/or the tampering prohibitions of the applicable land-based regulations (40 CFR part 86, 89, or 92).

* * * * *

Subpart K—[Amended]

38. Section 94.1103 is amended by revising paragraph (a)(5) to read as follows:

§94.1103 Prohibited acts.

(a) * * *

(5) For a manufacturer of marine vessels to distribute in commerce, sell, offer for sale, or deliver for introduction into commerce a new vessel containing an engine not covered by a certificate of conformity applicable for an engine model year the same as or later than the calendar year in which the manufacture of the new vessel is initiated. This prohibition covers improper installation in a manner such that the installed engine would not be covered by the engine manufacturer's certificate. Improper installation would include, but is not limited to, failure to follow the engine manufacturer's instructions related to engine cooling, exhaust aftertreatment, emission sampling ports, or any other emission-related component, parameter, or setting. In general, you may use up your normal inventory of engines not certified to new emission standards if they were built before the date of the new standards. However, we consider stockpiling of these engines to be a violation of paragraph (a)(1)(i)(A) of this section. (Note: For the purpose of this paragraph, the manufacture of a vessel is initiated when the keel is laid, or the vessel is at a similar stage of construction.)

* * * * *

39. A new subchapter U is added to read as follows:

SUBCHAPTER U—AIR POLLUTION CONTROLS

PART 1048—CONTROL OF EMISSIONS FROM NEW, LARGE NONROAD SPARK-IGNITION ENGINES

Subpart A—Determining How to Follow This Part

Sec.

1048.1 Does this part apply to me?

1048.5 Which engines are excluded or exempted from this part's requirements?

1048.10 What main steps must I take to comply with this part?

1048.15 Do any other regulation parts affect me?

1048.20 What requirements from this part apply to my excluded engines?

Subpart B—Emission Standards and Related Requirements

1048.101 What exhaust emission standards must my engines meet?

1048.105 What evaporative emissions standards and requirements apply?

1048.110 How must my engines diagnose malfunctions?

1048.115 What other requirements must my engines meet?

1048.120 What warranty requirements apply to me?

1048.125 What maintenance instructions must I give to buyers?

1048.130 What installation instructions must I give to equipment manufacturers?

1048.135 How must I label and identify the engines I produce?

1048.140 What are the provisions for certifying Blue Sky Series engines?

1048.145 What provisions apply only for a limited time?

Subpart C—Certifying Engine Families

1048.201 What are the general requirements for submitting a certification application?

1048.205 What must I include in my application?

1048.210 May I get preliminary approval before I complete my application?

1048.215 What happens after I complete my application?

1048.220 How do I amend the maintenance instructions in my application?

1048.225 How do I amend my application to include new or modified engines?

1048.230 How do I select engine families?

1048.235 What emission testing must I perform for my application for a certificate of conformity?

1048.240 How do I demonstrate that my engine family complies with exhaust emission standards?

1048.245 How do I demonstrate that my engine family complies with evaporative emission standards?

1048.250 What records must I keep and make available to EPA?

1048.255 When may EPA deny, revoke, or void my certificate of conformity?

Subpart D—Testing Production-line Engines

- 1048.301 When must I test my production-line engines?
- 1048.305 How must I prepare and test my production-line engines?
- 1048.310 How must I select engines for production-line testing?
- 1048.315 How do I know when my engine family fails the production-line testing requirements?
- 1048.320 What happens if one of my production-line engines fails to meet emission standards?
- 1048.325 What happens if an engine family fails the production-line requirements?
- 1048.330 May I sell engines from an engine family with a suspended certificate of conformity?
- 1048.335 How do I ask EPA to reinstate my suspended certificate?
- 1048.340 When may EPA revoke my certificate under this subpart and how may I sell these engines again?
- 1048.345 What production-line testing records must I send to EPA?
- 1048.350 What records must I keep?

Subpart E—Testing In-use Engines

- 1048.401 What testing requirements apply to my engines that have gone into service?
- 1048.405 How does this program work?
- 1048.410 How must I select, prepare, and test my in-use engines?
- 1048.415 What happens if in-use engines do not meet requirements?
- 1048.420 What in-use testing information must I report to EPA?
- 1048.425 What records must I keep?

Subpart F—Test Procedures

- 1048.501 What procedures must I use to test my engines?
- 1048.505 What steady-state duty cycles apply for laboratory testing?
- 1048.510 What transient duty cycles apply for laboratory testing?
- 1048.515 Field-testing procedures.

Subpart G—Compliance Provisions

- 1048.601 What compliance provisions apply to these engines?
- 1048.605 What are the provisions for exempting engines from the requirements of this part if they are already certified under the motor-vehicle program?
- 1048.610 What are the provisions for producing nonroad equipment with engines already certified under the motor-vehicle program?
- 1048.615 What are the provisions for exempting engines designed for lawn and garden applications?
- 1048.620 What are the provisions for exempting large engines fueled by natural gas?
- 1048.625 What special provisions apply to engines using noncommercial fuels?

Subpart H—[Reserved]

Subpart I—Definitions and Other Reference Information

- 1048.801 What definitions apply to this part?
- 1048.805 What symbols, acronyms, and abbreviations does this part use?

1048.810 What materials does this part reference?

1048.815 How should I request EPA to keep my information confidential?

1048.820 How do I request a hearing?

Appendix I to Part 1048—Large SI Transient Cycle for Constant-Speed Engines

Appendix II to Part 1048—Large SI Composite Transient Cycle

Authority: 42 U.S.C. 7401 - 7671(q).

Subpart A—Determining How to Follow This Part

§1048.1 Does this part apply to me?

- (a) This part applies to you if you manufacture or import new, spark-ignition, nonroad engines (defined in §1048.801) with maximum brake power above 19 kW, unless we exclude them under §1048.5. See §1048.20 for the requirements that apply to excluded engines.
- (b) If you manufacture or import engines with maximum brake power at or below 19 kW that would otherwise be covered by 40 CFR part 90, you may choose to meet the requirements of this part instead. In this case, all the provisions of this part apply for those engines.
- (c) As noted in subpart G of this part, 40 CFR part 1068 applies to everyone, including anyone who manufactures, installs, owns, operates, or rebuilds any of the engines this part covers or equipment containing these engines.
- (d) You need not follow this part for engines you produce before January 1, 2004, unless you certify voluntarily. See §§1048.101 through 1048.115 and §1048.145 and the definition of model year in §1048.801 for more information about the timing of new requirements.
- (e) See §§1048.801 and 1048.805 for definitions and acronyms that apply to this part. The definition section contains significant regulatory provisions and it is very important that you read them.

§1048.5 Which engines are excluded or exempted from this part's requirements?

- (a) This part does not apply to the following nonroad engines:
 - (1) Engines certified to meet the requirements of 40 CFR part 1051 (for example, engines used in snowmobiles and all-terrain vehicles).
 - (2) Propulsion marine engines. See 40 CFR part 91. This part applies with respect to auxiliary marine engines.
- (b) See subpart G of this part and 40 CFR part 1068, subpart C, for exemptions of specific engines.
- (c) Send the Designated Officer a written request if you want us to determine whether this part covers or excludes certain engines. Excluding engines from this part's requirements does not affect other requirements that may apply to them. Note: See 40 CFR part 87 for engines used in aircraft are excluded. See 40 CFR part 87.
- (c) As defined in §1048.801, stationary engines are not required to comply with this part (because they are not nonroad engines), except that you must meet the requirements in §1048.20. In addition, the prohibitions in 40 CFR 1068.101 restrict the use of stationary engines for non-stationary purposes.

§1048.10 What main steps must I take to comply with this part?

- (a) You must have a certificate of conformity from us for each engine family before you do any of the following with a new nonroad engine covered by this part: sell, offer for sale, introduce into commerce, distribute or deliver for introduction into commerce, or import it into the United States. "New" engines may include some already placed in service (see the definition of "new nonroad engine" and "new nonroad equipment" in §1048.801). You must get a new certificate of conformity for each new model year.
- (b) To get a certificate of conformity and comply with its terms, you must do six things:
 - (1) Meet the emission standards and other requirements in subpart B of this part.

- (2) Perform preproduction emission tests.
 - (3) Apply for certification (see subpart C of this part).
 - (4) Do routine emission testing on production engines as required by subpart D of this part.
 - (5) Do emission testing on in-use engines, as we direct under subpart E of this part.
 - (6) Follow our instructions throughout this part.
- (c) Subpart F of this part describes how to test your engines (including references to other parts).
- (d) Subpart G of this part and 40 CFR part 1068 describe requirements and prohibitions that apply to engine manufacturers, equipment manufacturers, owners, operators, rebuilders, and all others.

§1048.15 Do any other regulation parts affect me?

- (a) Part 1065 of this chapter describes procedures and equipment specifications for testing engines. Subpart F of this part describes how to apply the provisions of part 1065 of this chapter to show you meet the emission standards in this part.
- (b) Part 1068 of this chapter describes general provisions, including these seven areas:
- (1) Prohibited acts and penalties for engine manufacturers, equipment manufacturers, and others.
 - (2) Rebuilding and other aftermarket changes.
 - (3) Exclusions and exemption for certain engines.
 - (4) Importing engines.
 - (5) Selective enforcement audits of your production.
 - (6) Defect reporting and recall.
 - (7) Procedures for hearings.
- (c) Other parts of this chapter affect you if referenced in this part.

§1048.20 What requirements from this part apply to my excluded engines?

- (a) Engine manufacturers producing an engine that would be subject to all the requirements of this part, except for its use as a stationary engine (as identified under paragraph (2)(iii) in the definition of "nonroad engine" in 40 CFR §1068.30), must add a permanent label or tag identifying each engine. This applies equally to importers. To meet labeling requirements, you must do the following things:
- (1) Attach the label or tag in one piece so no one can remove it without destroying or defacing it.
 - (2) Make sure it is durable and readable for the engine's entire life.
 - (3) Secure it to a part of the engine needed for normal operation and not normally requiring replacement.
 - (4) Write it in block letters in English.
 - (5) Instruct equipment manufacturers that they must place a duplicate label as described in 40 CFR 1068.105 if they obscure the engine's label.
- (b) Engine labels or tags required under this section must have the following information:
- (1) Include the heading "Emission Control Information".
 - (2) Include your full corporate name and trademark.
 - (3) State the engine displacement (in liters) and maximum brake power.
 - (4) State: "THIS ENGINE IS EXCLUDED FROM THE REQUIREMENTS OF 40 CFR PART 1048 AS A "STATIONARY ENGINE." INSTALLING OR USING THIS ENGINE IN ANY OTHER APPLICATION MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.".

Subpart B—Emission Standards and Related Requirements

§1048.101 What exhaust emission standards must my engines meet?

Apply the exhaust emission standards in this section by model year. You may choose to certify engines earlier than we require. The Tier 1 standards apply only to steady-state testing, as described in paragraph (b) of this section. The Tier 2 standards apply to steady-state, transient, and field testing, as described in paragraphs (a), (b), and (c) of this section.

(a) Standards for transient testing. Starting in the 2007 model year, Tier 2 exhaust emission standards apply for transient measurement of emissions with the duty-cycle test procedures in subpart F of this part:

(1) The Tier 2 HC+NOx standard is 2.7 g/kW-hr and the Tier 2 CO standard is 4.4 g/kW-hr. For severe-duty engines, the Tier 2 HC+NOx standard is 2.7 g/kW-hr and the Tier 2 CO standard is 130.0 g/kW-hr. The standards in this paragraph (a) do not apply for transient testing of high-load engines.

(2) You may optionally certify your engines according to the following formula instead of the standards in paragraph (a)(1) of this section: $(\text{HC}+\text{NOx}) \times \text{CO}^{0.784} \leq 8.57$. The HC+NOx and CO emission levels you select to satisfy this formula, rounded to the nearest 0.1 g/kW-hr, become the emission standards that apply for those engines. You may not select an HC+NOx emission standard higher than 2.7 g/kW-hr or a CO emission standard higher than 20.6 g/kW-hr. The following table illustrates a range of possible values under this paragraph (a)(2):

Table 2 of §1048.101—
Examples of Possible Tier 2
Duty-cycle Emission Standards

HC+NOx (g/kW-hr)	CO (g/kW-hr)
2.7	4.4
2.2	5.6
1.7	7.9
1.3	11.1
1.0	15.5
0.8	20.6

(b) Standards for steady-state testing. Except as we allow in paragraph (d) of this section, the following exhaust emission standards apply for steady-state measurement of emissions with the duty-cycle test procedures in subpart F of this part:

(1) The following table shows the Tier 1 exhaust emission standards that apply to engines from 2004 through 2006 model years:

Table 1 of §1048.101—
Tier 1 Emission Standards (g/kW-hr)

Testing	General emission standards		Alternate emission standards for severe-duty engines	
	HC+NOx	CO	HC+NOx	CO
Certification and production-line testing	4.0	50.0	4.0	130.0
In-use testing	5.4	50.0	5.4	130.0

(2) Starting in the 2007 model year, engines must meet the Tier 2 exhaust emission standards in paragraph (a) of this section for both steady-state and transient testing. See paragraph (d) of this section for alternate standards that apply for certain engines.

(c) Standards for field testing. Starting in 2007, the following Tier 2 exhaust emission standards apply for emission measurements with the field-testing procedures in subpart F of this part:

(1) The HC+NOx standard is 3.8 g/kW-hr and the CO standard is 6.5 g/kW-hr. For severe-duty engines, the HC+NOx standard is 3.8 g/kW-hr and the CO standard is 200.0 g/kW-hr. For natural gas-fueled engines, you are not required to measure nonmethane hydrocarbon emissions or total hydrocarbon emissions for testing to show that the engine meets the emission standards of this paragraph (c); that is, you may assume HC emissions are equal to zero.

(2) You may apply the following formula to determine alternate emission standards that apply to your engines instead of the standards in paragraph (c)(1) of this section: $(\text{HC+NOx}) \times \text{CO}^{0.791} \leq 16.78$. HC+NOx emission levels may not exceed 3.8 g/kW-hr and CO emission levels may not exceed 31.0 g/kW-hr. The following table illustrates a range of possible values under this paragraph (c)(2):

Table 3 of §1048.101—
Examples of Possible Tier 2
Field-testing Emission Standards

HC+NOx (g/kW-hr)	CO (g/kW-hr)
3.8	6.5
3.1	8.5
2.4	11.7
1.8	16.8
1.4	23.1
1.1	31.0

(d) Engine protection. For engines that require enrichment at high loads to protect the engine, you may ask to meet

alternate Tier 2 standards of 2.7 g/kW-hr for HC+NO_x and 31.0 g/kW-hr for CO instead of the emission standards described in paragraph (b)(2) of this section for steady-state testing. If we approve your request, you must still meet the transient testing standards in paragraph (a) of this section and the field-testing standards in paragraph (c) of this section. To qualify for this allowance, you must do all the following things:

- (1) Show that enrichment is necessary to protect the engine from damage.
- (2) Show that you limit enrichment to operating modes that require additional cooling to protect the engine from damage.
- (3) Show in your application for certification that enrichment will rarely occur in use in the equipment in which your engines are installed. For example, an engine that is expected to operate 5 percent of the time in use with enrichment would clearly not qualify.
- (4) Include in your installation instructions any steps necessary for someone installing your engines to prevent enrichment during normal operation (see §1048.130).

(e) Fuel types. Apply the exhaust emission standards in this section for engines using each type of fuel specified in 40 CFR part 1065, subpart C, for which they are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

- (1) Gasoline- and LPG-fueled engines: THC emissions.
- (2) Natural gas-fueled engines: NMHC emissions.
- (3) Alcohol-fueled engines: THCE emissions.

(f) Small engines. Certain engines with total displacement at or below 1000 cc may comply with the requirements of 40 CFR part 90 instead of complying with the requirements of this part, as described in §1048.615.

(g) Useful life. Your engines must meet the exhaust emission standards in paragraphs (a) through (c) of this section over their full useful life (§1048.240 describes how to use deterioration factors to show this). The minimum useful life is 5,000 hours of operation or seven years, whichever comes first.

- (1) Specify a longer useful life in hours for an engine family under either of two conditions:
 - (i) If you design, advertise, or market your engine to operate longer than the minimum useful life (your recommended hours until rebuild may indicate a longer design life).
 - (ii) If your basic mechanical warranty is longer than the minimum useful life.
- (2) You may request a shorter useful life for an engine family if you have documentation from in-use engines showing that these engines will rarely operate longer than the alternate useful life. The useful life value may not be shorter than any of the following:
 - (i) 1,000 hours of operation.
 - (ii) Your recommended overhaul interval.
 - (iii) Your mechanical warranty for the engine.

(h) Applicability for testing. The standards in this subpart apply to all testing, including production-line and in-use testing, as described in subparts D and E of this part.

§1048.105 What evaporative emissions standards and requirements apply?

(a) Starting in the 2007 model year, engines that run on a volatile liquid fuel (such as gasoline), must meet the following evaporative emissions standards and requirements:

- (1) Evaporative hydrocarbon emissions may not exceed 0.2 grams per gallon of fuel tank capacity when measured with the test procedures for evaporative emissions in subpart F of this part.

(2) For nonmetallic fuel lines, you must specify and use products that meet the Category 1 specifications in SAE J2260 (incorporated by reference in §1048.810).

(3) Liquid fuel in the fuel tank may not reach boiling during continuous engine operation in the final installation at an ambient temperature of 30° C. Note that gasoline with a Reid vapor pressure of 62 kPa (9 psi) begins to boil at about 53° C.

(b) Note that §1048.245 allows you to use design-based certification instead of generating new emission data.

(c) If other companies install your engines in their equipment, give them any appropriate instructions, as described in §1048.130.

§1048.110 How must my engines diagnose malfunctions?

(a) Equip your engines with a diagnostic system. Starting in the 2007 model year, equip each engine with a diagnostic system that will detect significant malfunctions in its emission-control system using one of the following protocols:

(1) If your emission-control strategy depends on maintaining air-fuel ratios at stoichiometry, an acceptable diagnostic design would identify malfunction whenever the air-fuel ratio does not cross stoichiometry for one minute of intended closed-loop operation. You may use other diagnostic strategies if we approve them in advance.

(2) If the protocol described in paragraph (a)(1) of this section does not apply to your engine, you must use an alternative approach that we approve in advance. Your alternative approach must generally detect when the emission-control system is not functioning properly.

(b) Use a malfunction-indicator light (MIL). The MIL must be readily visible to the operator; it may be any color except red. When the MIL goes on, it must display “Check Engine,” “Service Engine Soon,” or a similar message that we approve. You may use sound in addition to the light signal. The MIL must go on under each of these circumstances:

(1) When a malfunction occurs, as described in paragraph (a) of this section.

(2) When the diagnostic system cannot send signals to meet the requirement of paragraph (b)(1) of this section.

(3) When the engine’s ignition is in the “key-on” position before starting or cranking. The MIL should go out after engine starting if the system detects no malfunction.

(c) Control when the MIL can go out. If the MIL goes on to show a malfunction, it must remain on during all later engine operation until servicing corrects the malfunction. If the engine is not serviced, but the malfunction does not recur for three consecutive engine starts during which the malfunctioning system is evaluated and found to be working properly, the MIL may stay off during later engine operation.

(d) Store trouble codes in computer memory. Record and store in computer memory any diagnostic trouble codes showing a malfunction that should illuminate the MIL. The stored codes must identify the malfunctioning system or component as uniquely as possible. Make these codes available through the data link connector as described in paragraph (g) of this section. You may store codes for conditions that do not turn on the MIL. The system must store a separate code to show when the diagnostic system is disabled (from malfunction or tampering).

(e) Make data, access codes, and devices accessible. Make all required data accessible to us without any access codes or devices that only you can supply. Ensure that anyone servicing your engine can read and understand the diagnostic trouble codes stored in the onboard computer with generic tools and information.

(f) Consider exceptions for certain conditions. Your diagnostic systems may disregard trouble codes for the first three minutes after engine starting. You may ask us to approve diagnostic-system designs that disregard trouble

codes under other conditions that would produce an unreliable reading, damage systems or components, or cause other safety risks. This might include operation at altitudes over 8,000 feet.

(g) Follow standard references for formats, codes, and connections. Follow conventions defined in the following documents (incorporated by reference in §1048.810) or ask us to approve using updated versions of (or variations from) these documents:

(1) ISO 9141-2 Road vehicles—Diagnostic systems— Part 2: CARB requirements for interchange of digital information, February 1994.

(2) ISO 14230-4 Road vehicles—Diagnostic systems—Keyword Protocol 2000— Part 4: Requirements for emission-related systems, June 2000.

§1048.115 What other requirements must my engines meet?

Your engines must meet the following requirements:

(a) Closed crankcase. Your engines may not vent crankcase emissions into the atmosphere throughout their useful life, with the following exception: your engines may vent crankcase emissions if you measure and include these crankcase emissions with all measured exhaust emissions.

(b) Torque broadcasting. Electronically controlled engines must broadcast their speed and output shaft torque (in newton-meters) on their controller area networks. Engines may alternatively broadcast a surrogate value for torque that can be read with a remote device. This information is necessary for testing engines in the field (see 40 CFR 1065.515). This requirement applies beginning in the 2007 model year. Small-volume engine manufacturers may omit this requirement.

(c) EPA access to broadcast information. If we request it, you must provide us any hardware or tools we would need to readily read, interpret, and record all information broadcast by an engine's on-board computers and electronic control modules. If you broadcast a surrogate parameter for torque values, you must provide us what we need to convert these into torque units. We will not ask for hardware or tools if they are readily available commercially.

(d) Emission sampling capability. Produce all your engines to allow sampling of exhaust emissions in the field without damaging the engine or equipment. Show in your application for certification how this can be done in a way that prevents diluting the exhaust sample with ambient air. To do this, you might simply allow for extending the exhaust pipe by 20 cm; you might also install exhaust ports downstream of any aftertreatment devices.

(e) Adjustable parameters. Engines that have adjustable parameters must meet all the requirements of this part for any adjustment in the physically adjustable range.

(1) We do not consider an operating parameter adjustable if you permanently seal it or if ordinary tools cannot readily access it.

(2) We may require that you set adjustable parameters to any specification within the adjustable range during certification testing, production-line testing, selective enforcement auditing, or any in-use testing.

(f) Prohibited controls. You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

(g) Defeat devices. You may not equip your engines with a defeat device. A defeat device is an auxiliary emission-control device that reduces the effectiveness of emission controls under conditions you may reasonably expect the engine to encounter during normal operation and use. This does not apply to auxiliary emission-control devices you

identify in your certification application if any of the following is true:

- (1) The conditions of concern were substantially included in your prescribed duty cycles.
- (2) You show your design is necessary to prevent catastrophic engine (or equipment) damage or accidents.
- (3) The reduced effectiveness applies only to starting the engine.

§1048.120 What warranty requirements apply to me?

(a) General requirements. You must warrant to the ultimate buyer that the new nonroad engine meets two conditions:

- (1) It is designed, built, and equipped it to conform at the time of sale with the requirements of this part.
- (2) It is free from defects in materials and workmanship that may keep it from meeting these requirements.

(b) Warranty period. Your emission-related warranty must be valid for at least 50 percent of the engine's useful life in hours of operation or at least three years, whichever comes first. In the case of a high-cost warranted part, the warranty must be valid for at least 70 percent of the engine's useful life in hours of operation or at least five years, whichever comes first. You may offer an emission-related warranty more generous than we require. This warranty may not be shorter than any published or negotiated warranty you offer for the engine or any of its components. If an engine has no hour meter, we base the warranty periods in this paragraph (b) only on the engine's age (in years).

(c) Components covered. The emission-related warranty must cover components whose failure would increase an engine's emissions, including electronic controls, fuel injection (for liquid or gaseous fuels), exhaust-gas recirculation, aftertreatment, or any other system you develop to control emissions. We generally consider replacing or repairing other components to be the owner's responsibility.

(d) Scheduled maintenance. You may schedule emission-related maintenance for a component named in paragraph (c) of this section, subject to the restrictions of §1048.125. You are not required to cover this scheduled maintenance under your warranty if the component meets either of the following criteria:

- (1) The component was in general use on similar engines, and was subject to scheduled maintenance, before January 1, 2000.
- (2) Failure of the component would clearly degrade the engine's performance enough that the operator would need to repair or replace it.

(e) Limited applicability. You may deny warranty claims under this section if the operator caused the problem, as described in 40 CFR 1068.115.

(f) Aftermarket parts. As noted 40 CFR 1068.101, it is a violation of the Act to manufacture an engine part if one of its main effects is to reduce the effectiveness of the engine's emission controls. If you make an aftermarket part, you may—but do not have to—certify that using the part will still allow engines to meet emission standards, as described in 40 CFR 85.2114.

§1048.125 What maintenance instructions must I give to buyers?

Give the ultimate buyer of each new nonroad engine written instructions for properly maintaining and using the engine, including the emission-control system. The maintenance instructions also apply to service accumulation on your test engines, as described in 40 CFR part 1065, subpart E.

(a) Critical emission-related maintenance. Critical emission-related maintenance includes any adjustment, cleaning, repair, or replacement of air-induction, fuel-system, or ignition components, aftertreatment devices, exhaust gas recirculation systems, crankcase ventilation valves, sensors, or electronic control units. This may also include any other component whose only purpose is to reduce emissions or whose failure will increase emissions without

significantly degrading engine performance. You may schedule critical emission-related maintenance on these components if you meet the following conditions:

(1) You may ask us to approve critical emission-related maintenance only if it meets two criteria:

- (i) Operators are reasonably likely to do the maintenance you call for.
- (ii) Engines need the maintenance to meet emission standards.

(2) We will accept scheduled maintenance as reasonably likely to occur in use if you satisfy any of four conditions:

- (i) You present data showing that, if a lack of maintenance increases emissions, it also unacceptably degrades the engine's performance.
- (ii) You present survey data showing that 80 percent of engines in the field get the maintenance you specify at the recommended intervals.
- (iii) You provide the maintenance free of charge and clearly say so in maintenance instructions for the customer.
- (iv) You otherwise show us that the maintenance is reasonably likely to be done at the recommended intervals.

(3) You may not schedule critical emission-related maintenance more frequently than the following intervals, except as specified in paragraph (a)(4) of this section:

- (i) For catalysts, fuel injectors, electronic control units, superchargers, and turbochargers: the useful life of the engine family.
- (ii) For gaseous fuel-system components (cleaning without disassembly only) and oxygen sensors: 2,500 hours.

(4) If your engine family has an alternate useful life shorter than the period specified in paragraph (a)(3)(ii) of this section, you may not schedule maintenance on those components more frequently than the alternate useful life (see §1048.101(g)).

(b) Recommended additional maintenance. You may recommend any additional amount of maintenance on the components listed in paragraph (a) of this section, as long as you make clear that these maintenance steps are not necessary to keep the emission-related warranty valid. If operators do the maintenance specified in paragraph (a) of this section, but not the recommended additional maintenance, this does not allow you to disqualify them from in-use testing or deny a warranty claim.

(c) Special maintenance. You may specify more frequent maintenance to address problems related to special situations such as substandard fuel or atypical engine operation. For example, you may specify more frequent cleaning of fuel system components for engines you have reason to believe will be using fuel that causes substantially more engine performance problems than commercial fuels of the same type that are generally available across the United States.

(d) Noncritical emission-related maintenance. For engine parts not listed in paragraph (a) of this section, you may schedule any amount of emission-related inspection or maintenance. But you must state clearly that these steps are not necessary to keep the emission-related warranty valid. Also, do not take these inspection or maintenance steps during service accumulation on your test engines.

(e) Maintenance that is not emission-related. For maintenance unrelated to emission controls, you may schedule any amount of inspection or maintenance. You may also take these inspection or maintenance steps during service accumulation on your test vehicles or engines. This might include adding engine oil or changing air, fuel, or oil filters.

(f) Source of parts and repairs. Print clearly on the first page of your written maintenance instructions that any repair shop or person may maintain, replace, or repair emission-control devices and systems. Your instructions may not require components or service identified by brand, trade, or corporate name. Also, do not directly or indirectly condition your warranty on a requirement that the vehicle be serviced by your franchised dealers or any other service establishments with which you have a commercial relationship.

You may disregard the requirements in this paragraph (f) if you do one of two things:

- (1) Provide a component or service without charge under the purchase agreement.
- (2) Get us to waive this prohibition in the public's interest by convincing us the engine will work properly only with the identified component or service.

§1048.130 What installation instructions must I give to equipment manufacturers?

(a) If you sell an engine for someone else to install in a piece of nonroad equipment, give the buyer of the engine written instructions for installing it consistent with the requirements of this part. Include all information necessary to ensure that engines installed this way will meet emission standards.

(b) Make sure these instructions have the following information:

- (1) Include the heading: "Emission-related installation instructions".
- (2) State: "Failing to follow these instructions when installing a certified engine in a piece of nonroad equipment violates federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act."
- (3) Describe any other instructions needed to install an exhaust aftertreatment device and to locate exhaust sampling ports consistent with your application for certification.
- (4) Describe the steps needed to control evaporative emissions, as described in §§1048.105 and 1048.245.
- (5) Describe any necessary steps for installing the diagnostic system described in §1048.110.
- (6) Describe any limits on the range of applications needed to ensure that the engine operates consistently with your application for certification. For example, if your engines are certified only for constant-speed operation, tell equipment manufacturers not to install the engines in variable-speed applications. Also, if you need to avoid sustained high-load operation to meet the field-testing emission standards we specify in §1048.101(c) or to comply with the provisions of §1048.101(d), describe how the equipment manufacturer must properly size the engines for a given application.
- (7) Describe any other instructions to make sure the installed engine will operate according to design specifications in your application for certification.
- (8) State: "If you install the engine in a way that makes the engine's emission control information label hard to read during normal engine maintenance, you must place a duplicate label on the vehicle, as described in 40 CFR 1068.105."

(c) You do not need installation instructions for engines you install in your own equipment.

§1048.135 How must I label and identify the engines I produce?

(a) Assign each production engine a unique identification number and permanently and legibly affix, engrave, or stamp it on the engine.

(b) At the time of manufacture, add a permanent emission control information label identifying each engine. To meet labeling requirements, do four things:

- (1) Attach the label in one piece so it is not removable without being destroyed or defaced.

- (2) Design and produce it to be durable and readable for the engine's entire life.
 - (3) Secure it to a part of the engine needed for normal operation and not normally requiring replacement.
 - (4) Write it in block letters in English.
- (c) On your engine's emission control information label, do 13 things:
- (1) Include the heading "EMISSION CONTROL INFORMATION".
 - (2) Include your full corporate name and trademark.
 - (3) State: "THIS ENGINE IS CERTIFIED TO OPERATE ON [specify operating fuel or fuels]."
 - (4) Identify the emission-control system; your identifiers must use names and abbreviations consistent with SAE J1930 (incorporated by reference in §1048.810).
 - (5) List all requirements for fuel and lubricants.
 - (6) State the date of manufacture [DAY (optional), MONTH, and YEAR]; if you stamp this information on the engine and print it in the owner's manual, you may omit it from the emission control information label.
 - (7) State: "THIS ENGINE MEETS U.S. ENVIRONMENTAL PROTECTION AGENCY REGULATIONS FOR [MODEL YEAR] LARGE NONROAD SI ENGINES."
 - (8) Include EPA's standardized designation for the engine family (and subfamily, where applicable).
 - (9) State the engine's displacement (in liters) and maximum brake power.
 - (10) State the engine's useful life (see §1048.101(g)).
 - (11) List specifications and adjustments for engine tuneups; show the proper position for the transmission during tuneup and state which accessories should be operating.
 - (12) Describe other information on proper maintenance and use.
 - (13) Identify the emission standards to which you have certified the engine.
- (d) Some of your engines may need more information on the emission control information label.
- (1) If you have an engine family that has been certified only for constant-speed engines, add to the engine label "CONSTANT-SPEED ONLY".
 - (2) If you have an engine family that has been certified only for variable-speed engines, add to the engine label "VARIABLE-SPEED ONLY".
 - (3) If you have an engine family that has been certified only for high-load engines, add to the engine label "THIS ENGINE IS NOT INTENDED FOR OPERATION AT LESS THAN 75 PERCENT OF FULL LOAD."
 - (4) If you certify an engine to the voluntary standards in §1048.140, add to the engine label "BLUE SKY SERIES".
 - (5) If you produce an engine we exempt from the requirements of this part, see subpart G of this part and 40 CFR part 1068, subparts C and D, for more label information.
 - (6) If you certify an engine family under §1048.101(d) (and show in your application for certification that in-use engines will experience infrequent high-load operation), add to the engine label "THIS ENGINE IS NOT INTENDED FOR OPERATION AT MORE THAN __ PERCENT OF FULL LOAD.". Specify the appropriate percentage of full load based on the nature of the engine protection. You may add other statements to discourage operation in engine-protection modes.
- (e) Some engines may not have enough space for an emission control information label with all the required information. In this case, you may omit the information required in paragraphs (c)(3), (c)(4), (c)(5), and (c)(12) of this section if you print it in the owner's manual instead.
- (f) If you are unable to meet these labeling requirements, you may ask us to modify them consistent with the intent of this section.

§1048.140 What are the provisions for certifying Blue Sky Series engines?

This section defines voluntary standards for a recognized level of superior emission control for engines designated as “Blue Sky Series” engines. Blue Sky Series engines must meet one of the following standards:

- (a) For the 2003 model year, to receive a certificate of conformity, a “Blue Sky Series” engine family must meet all the requirements in this part that apply to 2004 model year engines. This includes all testing and reporting requirements.
- (b) For the 2003 through 2006 model years, to receive a certificate of conformity, a “Blue Sky Series” engine family must meet all the requirements in this part that apply to 2007 model year engines. This includes all testing and reporting requirements.
- (c) For any model year, to receive a certificate of conformity as a “Blue Sky Series” engine family must meet all the requirements in this part, while certifying to the following exhaust emission standards:
 - (1) 0.8 g/kW-hr HC+NO_x and 4.4 g/kW-hr CO using steady-state and transient test procedures, as described in subpart F of this part.
 - (2) 1.1 g/kW-hr HC+NO_x and 6.6 g/kW-hr CO using field-testing procedures, as described in subpart F of this part.
- (d) If you certify an engine family under this section, it is subject to all the requirements of this part as if these voluntary standards were mandatory.

§1048.145 What provisions apply only for a limited time?

The provisions in this section apply instead of other provisions in this part. This section describes when these interim provisions expire.

- (a) Family banking. You may certify an engine family to comply with Tier 1 or Tier 2 standards earlier than necessary. For each model year of early compliance for an engine family, you may delay compliance with the same standards for an equal number of engines from another engine family (or families) for one model year. If you certify engines under the voluntary standards of §1048.140, you may not use them in your calculation under this paragraph (a). Base your calculation on actual power-weighted nationwide sales for each family. You may delay compliance for up to three model years. For example, if you sell 1,000 engines with an average power rating of 60 kW certified a year early, you may delay certification to that tier of standards for up to 60,000 kW-engine-years in any of the following ways:
 - (1) Delay certification of another engine family with an average power rating of 100 kW of up to 600 engines for one model year.
 - (2) Delay certification of another engine family with an average power rating of 100 kW of up to 200 engines for three model years.
 - (3) Delay certification of one engine family with an average power rating of 100 kW of up to 400 engines for one model year and a second engine family with an average power rating of 200 kW of up to 50 engines for two model years.
- (b) Hydrocarbon standards. For 2004 through 2006 model years, engine manufacturers may use nonmethane hydrocarbon measurements to demonstrate compliance with applicable emission standards.
- (c) Transient emission testing. Engines rated over 560 kW are exempt from the transient emission standards in §1048.101(a).
- (d) Tier 1 deterioration factors. For Tier 1 engines, base the deterioration factor from §1048.240 on 3500 hours of

operation. We may assign a deterioration factor for a Tier 1 engine family, but this would not affect your need to meet all emission standards that apply.

(e) [Reserved.]

(f) Optional early field testing. You may optionally use the field-testing procedures in subpart F of this part for any in-use testing required under subpart E of this part to show that you meet Tier 1 standards. In this case, the same Tier 1 in-use emission standards apply to both steady-state testing in the laboratory and field testing.

(g) Small-volume provisions. If you qualify for the hardship provisions in §1068.250 of this chapter, we may approve extensions of up to four years total.

(h) 2004 certification. For the 2004 model year, you may choose to have the emission standards and other requirements that apply to these engines in California serve as the emission standards and other requirements applicable under this part, instead of those in subpart A of this part. To ask for a certificate under this paragraph (h), send us the application for certification that you prepare for the California Air Resources Board instead of the information we otherwise require in §1048.205.

(i) Recreational vehicles. Engines or vehicles identified in the scope of 40 CFR part 1051 that are not yet regulated under that part are excluded from the requirements of this part. For example, snowmobiles produced in 2004 are not subject to the emission standards in this part. Once emission standards apply to these engines and vehicles, they are excluded from the requirements of this part under §1048.5(a)(1).

Subpart C—Certifying Engine Families

§1048.201 What are the general requirements for submitting a certification application?

- (a) Send us an application for a certificate of conformity for each engine family. Each application is valid for only one model year.
- (b) The application must not include false or incomplete statements or information (see §1048.255).
- (c) We may choose to ask you to send us less information than we specify in this subpart, but this would not change your recordkeeping requirements.
- (d) Use good engineering judgment for all decisions related to your application (see 40 CFR 1068.5).
- (e) An authorized representative of your company must approve and sign the application.

§1048.205 What must I include in my application?

In your application, do all the following things unless we ask you to send us less information:

- (a) Describe the engine family's specifications and other basic parameters of the engine's design. List the types of fuel you intend to use to certify the engine family (for example, gasoline, liquefied petroleum gas, methanol, or natural gas).
- (b) Explain how the emission-control systems operate.
 - (1) Describe in detail all the system components for controlling exhaust emissions, including auxiliary emission-control devices and all fuel-system components you will install on any production or test engine. Explain why any auxiliary emission-control devices are not defeat devices (see §1048.115(g)). Do not include detailed calibrations for components unless we ask for them.
 - (2) Describe the evaporative emission controls.
- (c) Explain how the engine diagnostic system works, describing especially the engine conditions (with the corresponding diagnostic trouble codes) that cause the malfunction-indicator light to go on. Propose what you consider to be extreme conditions under which the diagnostic system should disregard trouble codes, as described in §1048.110.
- (d) Describe the engines you selected for testing and the reasons for selecting them.
- (e) Describe any special or alternate test procedures you used (see §1048.501).
- (f) Describe how you operated the engine or vehicle prior to testing, including the duty cycle and the number of engine operating hours used to stabilize emission levels. Describe any scheduled maintenance you did.
- (g) List the specifications of the test fuel to show that it falls within the required ranges we specify in 40 CFR part 1065, subpart C.
- (h) Identify the engine family's useful life.
- (i) Propose maintenance and use instructions for the ultimate buyer of each new nonroad engine (see §1048.125).
- (j) Propose emission-related installation instructions if you sell engines for someone else to install in a piece of nonroad equipment (see §1048.130).
- (k) Identify each high-cost warranted part and show us how you calculated its replacement cost, including the estimated retail cost of the part, labor rates, and labor hours to diagnose and replace defective parts.
- (l) Propose an emission control information label.
- (m) Present emission data to show that you meet emission standards.
 - (1) Present exhaust emission data for HC, NO_x, and CO on a test engine to show your engines meet the duty-

cycle emission standards we specify in §1048.101(a) and (b). Show these figures before and after applying deterioration factors for each engine. Starting in the 2007 model year, identify the duty-cycle emission standards to which you are certifying engines in the engine family. Include test data for each type of fuel from 40 CFR part 1065, subpart C, on which you intend for engines in the engine family to operate (for example, gasoline, liquefied petroleum gas, methanol, or natural gas). If we specify more than one grade of any fuel type (for example, a summer grade and winter grade of gasoline), you only need to submit test data for one grade, unless the regulations of this part specify otherwise for your engine. Note that §1048.235 allows you to submit an application in certain cases without new emission data.

(2) If your engine family includes a volatile liquid fuel (and you do not use design-based certification under §1048.245) present evaporative test data to show your vehicles meet the evaporative emission standards we specify in subpart B of this part. Show these figures before and after applying deterioration factors, where applicable.

- (n) Report all test results, including those from invalid tests or from any nonstandard tests (such as measurements based on exhaust concentrations in parts per million).
- (o) Identify the engine family's deterioration factors and describe how you developed them. Present any emission test data you used for this.
- (p) Describe all adjustable operating parameters (see §1048.115(e)), including the following:
 - (1) The nominal or recommended setting.
 - (2) The intended physically adjustable range, including production tolerances if they affect the range.
 - (3) The limits or stops used to establish adjustable ranges.
- (q) Describe everything we need to read and interpret all the information broadcast by an engine's onboard computers and electronic control modules and state that you will give us any hardware or tools we would need to do this. You may reference any appropriate publicly released standards that define conventions for these messages and parameters. Format your information consistent with publicly released standards.
- (r) State whether your engine will operate in variable-speed applications, constant-speed applications, or both. If your certification covers only constant-speed or only variable-speed applications, describe how you will prevent use of these engines in the applications for which they are not certified.
- (s) Starting in the 2007 model year, state that all the engines in the engine family comply with the field-testing emission standards we specify in §1048.101(c) for all normal operation and use (see §1048.515). Describe in detail any testing, engineering analysis, or other information on which you base this statement.
- (t) State that you operated your test engines according to the specified procedures and test parameters using the fuels described in the application to show you meet the requirements of this part.
- (u) State unconditionally that all the engines in the engine family comply with the requirements of this part, other referenced parts, and the Clean Air Act.
- (v) Include estimates of U.S.-directed production volumes.
- (w) Show us how to modify your production engines to measure emissions in the field (see §1048.115(d)).
- (x) Add other information to help us evaluate your application if we ask for it.

§1048.210 May I get preliminary approval before I complete my application?

If you send us information before you finish the application, we will review it and make any appropriate determinations listed in §1048.215(b)(1) through (7). Decisions made under this section are considered to be preliminary approval. We will generally not disapprove applications under §1048.215(b)(1) through (5) where we

have given you preliminary approval, unless we find new and substantial information supporting a different decision.

(a) If you request preliminary approval related to the upcoming model year or the model year after that, we will make a "best-efforts" attempt to make the appropriate determinations as soon as possible. We will generally not provide preliminary approval related to a future model year more than two years ahead of time.

(b) You may consider full compliance with published guidance to be preliminary approval only if the guidance includes a statement that we intend you to consider it as such.

§1048.215 What happens after I complete my application?

(a) If any of the information in your application changes after you submit it, amend it as described in §1048.225.

(b) We may deny your application (that is, determine that we cannot approve it without revision) if the engine family does not meet the requirements of this part or the Act. For example:

(1) If you inappropriately use the provisions of §1048.230(c) or (d) to define a broader or narrower engine family, we will require you to redefine your engine family.

(2) If we determine you did not appropriately select the useful life under §1048.101(g), we will require you to lengthen it.

(3) If we determine you did not appropriately select deterioration factors under §1048.240(c), we will require you to revise them.

(4) If your diagnostic system is inadequate for detecting significant malfunctions in emission-control systems, as described in §1048.110(b), we will require you to make the system more effective.

(5) If your diagnostic system inappropriately disregards trouble codes under certain conditions, as described in §1048.110(f), we will require you to change the system to operate under broader conditions.

(6) If your proposed emission control information label is inconsistent with §1048.135, we will require you to change it (and tell you how, if possible).

(7) If you require or recommend maintenance and use instructions inconsistent with §1048.125, we will require you to change them.

(8) If we find any other problem with your application, we will tell you what the problem is and what needs to be corrected.

(c) If we determine your application is complete and shows that the engine family meets all the requirements of this part and the Act, we will issue a certificate of conformity for your engine family for that model year. If we deny the application, we will explain why in writing. You may then ask us to hold a hearing to reconsider our decision (see §1048.820).

§1048.220 How do I amend the maintenance instructions in my application?

Send the Designated Officer a request to amend your application for certification for an engine family if you want to change the emission-related maintenance instructions in a way that could affect emissions. In your request, describe the proposed changes to the maintenance instructions.

(a) If you are decreasing the specified level of maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. We may approve a shorter time or waive this requirement.

(b) If your requested change would not decrease the specified level of maintenance, you may distribute the new maintenance instructions anytime after you send your request.

(c) If you are correcting or clarifying your maintenance instructions or if you are changing instructions for maintenance unrelated to emission controls, the requirements of this section do not apply.

§1048.225 How do I amend my application to include new or modified engines?

- (a) You must amend your application for certification before you take either of the following actions:
- (1) Add an engine to a certificate of conformity (this includes any changes you make in selecting emission standards under §1048.205(m)(1)).
 - (2) Make a design change for a certified engine family that may affect emissions or an emission-related part over the engine's lifetime.
- (b) Send the Designated Officer a request to amend the application for certification for an engine family. In your request, do all of the following:
- (1) Describe the engine model or configuration you are adding or changing.
 - (2) Include engineering evaluations or reasons why the original test engine is or is not still appropriate.
 - (3) If the original test engine for the engine family is not appropriate to show compliance for the new or modified nonroad engine, include new test data showing that the new or modified nonroad engine meets the requirements of this part.
- (c) You may start producing the new or modified nonroad engine anytime after you send us your request. If we determine that the affected engines do not meet applicable requirements, we will require you to cease production of the engines and to recall and correct the engines at no expense to the owner. If you choose to produce engines under this paragraph (c), we will consider that to be consent to recall all engines that we determine do not meet applicable standards or other requirements and to remedy the nonconformity at no expense to the owner.
- (d) You must give us test data within 30 days if we ask for more testing, or stop producing the engine if you cannot do this. You may give us an engineering evaluation instead of test data if we agree that you can address our questions without test data.
- (e) If we determine that the certificate of conformity would not cover your new or modified nonroad engine, we will send you a written explanation of our decision. In this case, you may no longer produce these engines, though you may ask for a hearing for us to reconsider our decision (see §1048.820).

§1048.230 How do I select engine families?

- (a) Divide your product line into families of engines that you expect to have similar emission characteristics. Your engine family is limited to a single model year.
- (b) Group engines in the same engine family if they are the same in all of the following aspects:
- (1) The combustion cycle.
 - (2) The cooling system (water-cooled vs. air-cooled).
 - (3) Configuration of the fuel system (for example, fuel injection vs. carburetion).
 - (4) Method of air aspiration.
 - (5) The number, location, volume, and composition of catalytic converters.
 - (6) The number, arrangement, and approximate bore diameter of cylinders.
 - (7) Evaporative emission controls.
- (c) In some cases you may subdivide a group of engines that is identical under paragraph (b) of this section into different engine families. To do so, you must show you expect emission characteristics to be different during the useful life or that any of the following engine characteristics are different:

- (1) Method of actuating intake and exhaust timing (poppet valve, reed valve, rotary valve, etc.).
 - (2) Location or size of intake and exhaust valves or ports.
 - (3) Configuration of the combustion chamber.
 - (4) Cylinder stroke.
 - (5) Exhaust system.
 - (6) Type of fuel.
- (d) If your engines are not identical with respect to the things listed in paragraph (b) of this section, but you show that their emission characteristics during the useful life will be similar, we may approve grouping them in the same engine family.
- (e) If you cannot appropriately define engine families by the method in this section, we will define them based on features related to emission characteristics.
- (f) You may ask us to create separate families for exhaust emissions and evaporative emissions. If we do this, list both families on the emission control information label.
- (g) Where necessary, you may divide an engine family into sub-families to meet different emission standards, as specified in §1048.101(a)(2). For issues related to compliance and prohibited actions, we will generally apply decisions to the whole engine family. For engine labels and other administrative provisions, we may approve your request for separate treatment of sub-families.

§1048.235 What emission testing must I perform for my application for a certificate of conformity?

This section describes the emission testing you must perform to show compliance with the emission standards in §§1048.101(a) and (b) and 1048.105 during certification. See §1048.205(s) regarding emission testing related to the field-testing emission standards.

- (a) Test your emission-data engines using the procedures and equipment specified in subpart F of this part. For any testing related to evaporative emissions, use good engineering judgment to include a complete fuel system with the engine.
- (b) Select engine families according to the following criteria:
- (1) For exhaust testing, select from each engine family a test engine for each fuel type with a configuration that is most likely to exceed the exhaust emission standards, using good engineering judgment. Consider the emission levels of all exhaust constituents over the full useful life of the engine when operated in a piece of equipment.
 - (2) For evaporative testing, select from each engine family a test fuel system for each fuel type with a configuration that is most likely to exceed the evaporative emission standards, using good engineering judgment.
- (c) You may use previously generated emission data in either of the following cases:
- (1) You may submit emission data for equivalent engine families from previous years instead of doing new tests, but only if the data show that the test engine would meet all the requirements for the latest engine models. We may require you to do new emission testing if we believe the latest engine models could be substantially different from the previously tested engine.
 - (2) You may submit emission data for equivalent engine families performed to show compliance with other standards (such as California standards) instead of doing new tests, but only if the data show that the test engine would meet all of this part's requirements.
- (d) We may choose to measure emissions from any of your test engines (or other engines from the engine family).
- (1) If we do this, you must provide the test engine at the location we select. We may decide to do the testing at

your plant or any other facility. If we choose to do the testing at your plant, you must schedule it as soon as possible and make available the instruments and equipment we need.

(2) If we measure emissions on one of your test engines, the results of that testing become the official data for the engine. Unless we later invalidate this data, we may decide not to consider your data in determining if your engine family meets the emission standards.

(3) Before we test one of your engines, we may set its adjustable parameters to any point within the physically adjustable ranges (see §1048.115(e)).

(4) Calibrate the test engine within normal production tolerances for anything we do not consider an adjustable parameter (see §1048.205(p)).

§1048.240 How do I demonstrate that my engine family complies with exhaust emission standards?

(a) For certification, your engine family is considered in compliance with the numerical emission standards in §1048.101 (a) and (b), if all emission-data engines representing that family have test results showing emission levels at or below these standards.

(b) Your engine family does not comply if any emission-data engine representing that family has test results showing emission levels above the standards from §1048.101 (a) and (b) for any pollutant.

(c) To compare emission levels from the test engine with the emission standards, apply deterioration factors to the measured emission levels. The deterioration factor is a number that shows the relationship between exhaust emissions at the end of useful life and at the low-hour test point. Specify the deterioration factors based on emission measurements using four significant figures, consistent with good engineering judgment. For example, deterioration factors must be consistent with emission increases observed from in-use testing with similar engines (see subpart E of this part). Small-volume engine manufacturers may use assigned deterioration factors that we establish. Apply the deterioration factors as follows:

(1) For engines that use aftertreatment technology, such as catalytic converters, the deterioration factor is the ratio of exhaust emissions at the end of useful life to exhaust emissions at the low-hour test point. Adjust the official emission results for each tested engine at the selected test point by multiplying the measured emissions by the deterioration factor. If the factor is less than one, use one.

(2) For engines that do not use aftertreatment technology, the deterioration factor is the difference between exhaust emissions at the end of useful life and exhaust emissions at the low-hour test point. Adjust the official emission results for each tested engine at the selected test point by adding the factor to the measured emissions. If the factor is less than zero, use zero.

(d) After adjusting the emission levels for deterioration, round them to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each test engine.

§1048.245 How do I demonstrate that my engine family complies with evaporative emission standards?

(a) For certification, your engine family is considered in compliance with the evaporative emission standards in subpart B of this part if you do either of the following:

(1) You have test results showing that evaporative emissions in the family are at or below the standards throughout the useful life.

(2) Where applicable, you comply with the design specifications in paragraph (e) of this section.

(b) Your engine family does not comply if any fuel system representing that family has test results showing emission levels above the standards.

- (c) Use good engineering judgment to develop a test plan to establish deterioration factors to show how much emissions increase at the end of useful life.
- (d) If you adjust the emission levels for deterioration, round them to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each test fuel system.
- (e) You may demonstrate that your engine family complies with the evaporative emission standards by demonstrating that you use the following control technologies:
 - (1) For certification to the standards specified in §1048.105(a)(1), with the following technologies:
 - (i) Use a tethered or self-closing gas cap on a fuel tank that stays sealed up to a positive pressure of 24.5 kPa (3.5 psig) or a vacuum pressure of 10.5 kPa (1.5 psig).
 - (ii) [Reserved].
 - (2) For certification to the standards specified in §1048.105(a)(3), demonstrating that you use design features to prevent fuel boiling under all normal operation. You may do this using fuel temperature data measured during normal operation.
 - (3) We may establish additional options for design-based certification where we find that new test data demonstrate that a technology will ensure compliance with the emission standards in this section

§1048.250 What records must I keep and make available to EPA?

- (a) Organize and maintain the following records to keep them readily available; we may review these records at any time:
 - (1) A copy of all applications and any summary information you sent us.
 - (2) Any of the information we specify in §1048.205 that you did not include in your application.
 - (3) A detailed history of each emission-data engine. In each history, describe all of the following:
 - (i) The test engine's construction, including its origin and buildup, steps you took to ensure that it represents production engines, any components you built specially for it, and all emission-related components.
 - (ii) How you accumulated engine operating hours, including the dates and the number of hours accumulated.
 - (iii) All maintenance (including modifications, parts changes, and other service) and the dates and reasons for the maintenance.
 - (iv) All your emission tests, including documentation on routine and standard tests, as specified in part 40 CFR part 1065, and the date and purpose of each test.
 - (v) All tests to diagnose engine or emission-control performance, giving the date and time of each and the reasons for the test.
 - (vi) Any other significant events.
- (b) Keep data from routine emission tests (such as test cell temperatures and relative humidity readings) for one year after we issue the associated certificate of conformity. Keep all other information specified in paragraph (a) of this section for eight years after we issue your certificate.
- (c) Store these records in any format and on any media, as long as you can promptly send us organized, written records in English if we ask for them.
- (d) Send us copies of any engine maintenance instructions or explanations if we ask for them.

§1048.255 When may EPA deny, revoke, or void my certificate of conformity?

- (a) We may deny your application for certification if your engine family fails to comply with emission standards or other requirements of this part or the Act. Our decision may be based on any information available to us showing you do not meet emission standards or other requirements, including any testing that we conduct under paragraph (f) of this section. If we deny your application, we will explain why in writing.
- (b) In addition, we may deny your application or revoke your certificate if you do any of the following:
 - (1) Refuse to comply with any testing or reporting requirements.
 - (2) Submit false or incomplete information (paragraph (d) of this section applies if this is fraudulent).
 - (3) Render inaccurate any test data.
 - (4) Deny us from completing authorized activities despite our presenting a warrant or court order (see 40 CFR 1068.20).
 - (5) Produce engines for importation into the United States at a location where local law prohibits us from carrying out authorized activities.
- (c) We may void your certificate if you do not keep the records we require or do not give us information when we ask for it.
- (d) We may void your certificate if we find that you intentionally submitted false or incomplete information.
- (e) If we deny your application or revoke or void your certificate, you may ask for a hearing (see §1048.820). Any such hearing will be limited to substantial and factual issues.
- (f) We may conduct confirmatory testing of your engines as part of certification. We may deny your application for certification or revoke your certificate if your engines fail to comply with emission standards or other requirements during confirmatory testing.

Subpart D—Testing Production-line Engines

§1048.301 When must I test my production-line engines?

- (a) If you produce engines that are subject the requirements of this part, you must test them as described in this subpart.
- (b) We may suspend or revoke your certificate of conformity for certain engine families if your production-line engines do not meet the requirements of this part or you do not fulfill your obligations under this subpart (see §§1048.325 and 1048.340).
- (c) Other requirements apply to engines that you produce. Other regulatory provisions authorize us to suspend, revoke, or void your certificate of conformity, or order recalls for engines families without regard to whether they have passed these production-line testing requirements. The requirements of this part do not affect our ability to do selective enforcement audits, as described in part 1068 of this chapter. Individual engines in families that pass these production-line testing requirements must also conform to all applicable regulations of this part and part 1068 of this chapter.
- (d) You may ask to use an alternate program for testing production-line engines. In your request, you must show us that the alternate program gives equal assurance that your production-line engines meet the requirements of this part. If we approve your alternate program, we may waive some or all of this subpart's requirements.
- (e) If you certify an engine family with carryover emission data, as described in §1048.235(c), and these equivalent engine families consistently pass the production-line testing requirements over the preceding two-year period, you may ask for a reduced testing rate for further production-line testing for that family. The minimum testing rate is one engine per engine family. If we reduce your testing rate, we may limit our approval to any number of model years. In determining whether to approve your request, we may consider the number of engines that have failed the emission tests.
- (f) We may ask you to make a reasonable number of production-line engines available for a reasonable time so we can test or inspect them for compliance with the requirements of this part.

§1048.305 How must I prepare and test my production-line engines?

- (a) Test procedures. Test your production-line engines using either the steady-state or transient testing procedures in subpart F of this part to show you meet the emission standards in §1048.101(a) or (b), respectively. We may require you to test engines using the transient testing procedures to show you meet the emission standards in §1048.101(a).
- (b) Modifying a test engine. Once an engine is selected for testing (see §1048.310), you may adjust, repair, prepare, or modify it or check its emissions only if one of the following is true:
 - (1) You document the need for doing so in your procedures for assembling and inspecting all your production engines and make the action routine for all the engines in the engine family.
 - (2) This subpart otherwise specifically allows your action.
 - (3) We approve your action in advance.
- (c) Engine malfunction. If an engine malfunction prevents further emission testing, ask us to approve your decision to either repair the engine or delete it from the test sequence.
- (d) Setting adjustable parameters. Before any test, we may adjust or require you to adjust any adjustable parameter to any setting within its physically adjustable range.

(1) We may adjust idle speed outside the physically adjustable range as needed only until the engine has stabilized emission levels (see paragraph (e) of this section). We may ask you for information needed to establish an alternate minimum idle speed.

(2) We may make or specify adjustments within the physically adjustable range by considering their effect on emission levels, as well as how likely it is someone will make such an adjustment with in-use engines.

(e) Stabilizing emission levels. Before you test production-line engines, you may operate the engine to stabilize the emission levels. Using good engineering judgment, operate your engines in a way that represents the way production engines will be used. You may operate each engine for no more than the greater of two periods:

(1) 50 hours.

(2) The number of hours you operated your emission-data engine for certifying the engine family (see 40 CFR part 1065, subpart E).

(f) Damage during shipment. If shipping an engine to a remote facility for production-line testing makes necessary an adjustment or repair, you must wait until after the after the initial emission test to do this work. We may waive this requirement if the test would be impossible or unsafe, or if it would permanently damage the engine. Report to us, in your written report under §1048.345, all adjustments or repairs you make on test engines before each test.

(g) Retesting after invalid tests. You may retest an engine if you determine an emission test is invalid. Explain in your written report reasons for invalidating any test and the emission results from all tests. If you retest an engine and, within ten days after testing, ask to substitute results of the new tests for the original ones, we will answer within ten days after we receive your information.

§1048.310 How must I select engines for production-line testing?

(a) Use test results from two engines for each engine family to calculate the required sample size for the model year. Update this calculation with each test.

(b) Early in each calendar quarter, randomly select and test two engines from the end of the assembly line for each engine family.

(c) Calculate the required sample size for each engine family. Separately calculate this figure for HC+NO_x and for CO. The required sample size is the greater of these two calculated values. Use the following equation:

$$N = \left[\frac{(t_{95} \times \sigma)}{(x - STD)} \right]^2 + 1$$

Where:

N = Required sample size for the model year.

t₉₅ = 95% confidence coefficient, which depends on the number of tests completed, n, as specified in the table in paragraph (c)(1) of this section. It defines 95% confidence intervals for a one-tail distribution.

x = Mean of emission test results of the sample.

STD = Emission standard.

σ = Test sample standard deviation (see paragraph (c)(2) of this section).

(1) Determine the 95% confidence coefficient, t_{95} , from the following table:

n	t_{95}	n	t_{95}	n	t_{95}
2	6.31	12	1.80	22	1.72
3	2.92	13	1.78	23	1.72
4	2.35	14	1.77	24	1.71
5	2.13	15	1.76	25	1.71
6	2.02	16	1.75	26	1.71
7	1.94	17	1.75	27	1.71
8	1.90	18	1.74	28	1.70
9	1.86	19	1.73	29	1.70
10	1.83	20	1.73	30+	1.70
11	1.81	21	1.72		

(2) Calculate the standard deviation, σ , for the test sample using the following formula:

$$\sigma = \sqrt{\frac{\sum(X_i - x)^2}{n - 1}}$$

Where:

- X_i = Emission test result for an individual engine.
- n = The number of tests completed in an engine family.

(d) Use final deteriorated test results to calculate the variables in the equations in paragraph (c) of this section (see §1048.315(a)).

(e) After each new test, recalculate the required sample size using the updated mean values, standard deviations, and the appropriate 95-percent confidence coefficient.

(f) Distribute the remaining engine tests evenly throughout the rest of the year. You may need to adjust your schedule for selecting engines if the required sample size changes. Continue to randomly select engines from each engine family; this may involve testing engines that operate on different fuels.

(g) Continue testing any engine family for which the sample mean, x , is greater than the emission standard. This applies if the sample mean for either HC+NO_x or for CO is greater than the emission standard. Continue testing until one of the following things happens:

- (1) The sample size, n , for an engine family is greater than the required sample size, N , and the sample mean, x , is less than or equal to the emission standard. For example, if $N = 3.1$ after the third test, the sample-size calculation does not allow you to stop testing.
- (2) The engine family does not comply according to §1048.325.
- (3) You test 30 engines from the engine family.
- (4) You test one percent of your projected annual U.S.-directed production volume for the engine family.

- (5) You choose to declare that the engine family does not comply with the requirements of this subpart.
- (h) If the sample-size calculation allows you to stop testing for a pollutant, you must continue measuring emission levels of that pollutant for any additional tests required under this section. However, you need not continue making the calculations specified in this section for that pollutant. This paragraph (h) does not affect the requirements in section §1048.320.
- (i) You may elect to test more randomly chosen engines than we require. Include these engines in the sample-size calculations.

§1048.315 How do I know when my engine family fails the production-line testing requirements?

This section describes the pass/fail criteria for the production-line testing requirements. We apply this criteria on an engine-family basis. See §1048.320 for the requirements that apply to individual engines that fail a production-line test.

- (a) Calculate your test results. Round them to the number of decimal places in the emission standard expressed to one more decimal place.
- (1) Initial and final test results. Calculate and round the test results for each engine. If you do several tests on an engine, calculate the initial test results, then add them together and divide by the number of tests and round for the final test results on that engine.
- (2) Final deteriorated test results. Apply the deterioration factor for the engine family to the final test results (see §1048.240(c)).
- (b) Construct the following CumSum Equation for each engine family (for HC+NOx and for CO emissions):

$$C_i = C_{i-1} + X_i - (STD + 0.25 \times \sigma)$$

Where:

- C_i = The current CumSum statistic.
- C_{i-1} = The previous CumSum statistic. For the first test, CumSum statistic is 0 (i.e. $C_1 = 0$).
- X_i = The current emission test result for an individual engine.
- STD = Emission standard.

- (c) Use final deteriorated test results to calculate the variables in the equation in paragraph (b) of this section (see §1048.315(a)).
- (d) After each new test, recalculate the CumSum statistic.
- (e) If you test more than the required number of engines, include the results from these additional tests in the CumSum Equation.
- (f) After each test, compare the current CumSum statistic, C_i , to the recalculated Action Limit, H, defined as $H = 5.0 \times \sigma$.
- (g) If the CumSum statistic exceeds the Action Limit in two consecutive tests, the engine family fails the production-line testing requirements of this subpart. Tell us within ten working days if this happens.
- (h) If you amend the application for certification for an engine family (see §1048.225), do not change any previous calculations of sample size or CumSum statistics for the model year.

§1048.320 What happens if one of my production-line engines fails to meet emission standards?

If you have a production-line engine with final deteriorated test results exceeding one or more emission standards (see §1048.315(a)), the certificate of conformity is automatically suspended for that failing engine. You must take the following actions before your certificate of conformity can cover that engine:

- (a) Correct the problem and retest the engine to show it complies with all emission standards.
- (b) Include in your written report a description of the test results and the remedy for each engine (see §1048.345).

§1048.325 What happens if an engine family fails the production-line requirements?

(a) We may suspend your certificate of conformity for an engine family if it fails under §1048.315. The suspension may apply to all facilities producing engines from an engine family, even if you find noncompliant engines only at one facility.

(b) We will tell you in writing if we suspend your certificate in whole or in part. We will not suspend a certificate until at least 15 days after the engine family fails. The suspension is effective when you receive our notice.

(c) Up to 15 days after we suspend the certificate for an engine family, you may ask for a hearing (see §1048.820). If we agree before a hearing that we used erroneous information in deciding to suspend the certificate, we will reinstate the certificate.

(d) Section §1048.335 specifies steps you must take to remedy the cause of the production-line failure. All the engines you have produced since the end of the last test period are presumed noncompliant and should be addressed in your proposed remedy. We may require you to apply the remedy to engines produced earlier if we determine that the cause of the failure is likely to have affected the earlier engines.

§1048.330 May I sell engines from an engine family with a suspended certificate of conformity?

You may sell engines that you produce after we suspend the engine family's certificate of conformity under §1048.315 only if one of the following occurs:

- (a) You test each engine you produce and show it complies with emission standards that apply.
- (b) We conditionally reinstate the certificate for the engine family. We may do so if you agree to recall all the affected engines and remedy any noncompliance at no expense to the owner if later testing shows that the engine family still does not comply.

§1048.335 How do I ask EPA to reinstate my suspended certificate?

(a) Send us a written report asking us to reinstate your suspended certificate. In your report, identify the reason for noncompliance, propose a remedy for the engine family, and commit to a date for carrying it out. In your proposed remedy include any quality control measures you propose to keep the problem from happening again.

(b) Give us data from production-line testing that shows the remedied engine family complies with all the emission standards that apply.

§1048.340 When may EPA revoke my certificate under this subpart and how may I sell these engines again?

(a) We may revoke your certificate for an engine family in the following cases:

- (1) You do not meet the reporting requirements.
- (2) Your engine family fails to comply with the requirements of this subpart and your proposed remedy to address a suspended certificate under §1048.325 is inadequate to solve the problem or requires you to change

the engine's design or emission-control system.

(b) To sell engines from an engine family with a revoked certificate of conformity, you must modify the engine family and then show it complies with the requirements of this part.

(1) If we determine your proposed design change may not control emissions for the engine's full useful life, we will tell you within five working days after receiving your report. In this case we will decide whether production-line testing will be enough for us to evaluate the change or whether you need to do more testing.

(2) Unless we require more testing, you may show compliance by testing production-line engines as described in this subpart.

(3) We will issue a new or updated certificate of conformity when you have met these requirements.

§1048.345 What production-line testing records must I send to EPA?

Do all the following things unless we ask you to send us less information:

(a) Within 30 calendar days of the end of each calendar quarter, send us a report with the following information:

(1) Describe any facility used to test production-line engines and state its location.

(2) State the total U.S.-directed production volume and number of tests for each engine family.

(3) Describe how you randomly selected engines.

(4) Describe your test engines, including the engine family's identification and the engine's model year, build date, model number, identification number, and number of hours of operation before testing for each test engine.

(5) Identify where you accumulated hours of operation on the engines and describe the procedure and schedule you used.

(6) Provide the test number; the date, time and duration of testing; test procedure; initial test results before and after rounding; final test results; and final deteriorated test results for all tests. Provide the emission results for all measured pollutants. Include information for both valid and invalid tests and the reason for any invalidation.

(7) Describe completely and justify any nonroutine adjustment, modification, repair, preparation, maintenance, or test for the test engine if you did not report it separately under this subpart. Include the results of any emission measurements, regardless of the procedure or type of equipment.

(8) Provide the CumSum analysis required in §1048.315 for each engine family.

(9) Report on each failed engine as described in §1048.320.

(10) State the date the calendar quarter ended for each engine family.

(b) We may ask you to add information to your written report, so we can determine whether your new nonroad engines conform with the requirements of this subpart.

(c) An authorized representative of your company must sign the following statement:

We submit this report under Sections 208 and 213 of the Clean Air Act. Our production-line testing conformed completely with the requirements of 40 CFR part 1048. We have not changed production processes or quality-control procedures for the engine family in a way that might affect the emission control from production engines. All the information in this report is true and accurate, to the best of my knowledge. I know of the penalties for violating the Clean Air Act and the regulations. (Authorized Company Representative)

(d) Send electronic reports of production-line testing to the Designated Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.

(e) We will send copies of your reports to anyone from the public who asks for them. See §1048.815 for information on how we treat information you consider confidential.

§1048.350 What records must I keep?

- (a) Organize and maintain your records as described in this section. We may review your records at any time, so it is important to keep required information readily available.
- (b) Keep paper records of your production-line testing for one full year after you complete all the testing required for an engine family in a model year. You may use any additional storage formats or media if you like.
- (c) Keep a copy of the written reports described in §1048.345.
- (d) Keep the following additional records:
 - (1) A description of all test equipment for each test cell that you can use to test production-line engines.
 - (2) The names of supervisors involved in each test.
 - (3) The name of anyone who authorizes adjusting, repairing, preparing, or modifying a test engine and the names of all supervisors who oversee this work.
 - (4) If you shipped the engine for testing, the date you shipped it, the associated storage or port facility, and the date the engine arrived at the testing facility.
 - (5) Any records related to your production-line tests that are not in the written report.
 - (6) A brief description of any significant events during testing not otherwise described in the written report or in this section.
 - (7) Any information specified in §1048.345 that you do not include in your written reports.
- (e) If we ask, you must give us projected or actual production figures for an engine family. We may ask you to divide your production figures by maximum brake power, displacement, fuel type, or assembly plant (if you produce engines at more than one plant).
- (f) Keep a list of engine identification numbers for all the engines you produce under each certificate of conformity. Give us this list within 30 days if we ask for it.
- (g) We may ask you to keep or send other information necessary to implement this subpart.

Subpart E—Testing In-use Engines

§1048.401 What testing requirements apply to my engines that have gone into service?

- (a) If you produce engines that are subject to the requirements of this part, you must test them as described in this subpart. This generally involves testing engines in the field or removing them for measurement in a laboratory.
- (b) We may approve an alternate plan for showing that in-use engines comply with the requirements of this part if one of the following is true:
 - (1) You produce 200 or fewer engines per year in the selected engine family.
 - (2) Removing the engine from most of the applications for that engine family causes significant, irreparable damage to the equipment.
 - (3) You identify a unique aspect of your engine applications that keeps you from doing the required in-use testing.
- (c) We may void your certificate of conformity for an engine family if you do not meet your obligations under this part.
- (d) Independent of your responsibility to test in-use engines, we may choose at any time to do our own testing of your in-use engines.
- (e) If in-use testing shows that engines fail to meet emission standards or other requirements of this part, we may pursue a recall or other remedy as allowed by the Act (see §1048.415).

§1048.405 How does this program work?

- (a) You must test in-use engines, for exhaust emissions, from the families we select. We may select up to 25 percent of your engine families in any model year—or one engine family if you have three or fewer families. We will select engine families for testing before the end of the model year. When we select an engine family for testing, we may specify that you preferentially test engines based on fuel type or equipment type. In addition, we may identify specific modes of operation or sampling times. You may choose to test additional engine families that we do not select.
- (b) Send us an in-use testing plan within 12 calendar months after we direct you to test a particular engine family. Complete the testing within 24 calendar months after we approve your plan.
- (c) You may need to test engines from more than one model year at a given time.

§1048.410 How must I select, prepare, and test my in-use engines?

- (a) You may make arrangements to select representative test engines from your own fleet or from other independent sources.
- (b) For the selected engine families, select engines that you or your customers have—
 - (1) Operated for at least 50 percent of the engine family's useful life (see §1048.101(d));
 - (2) Not maintained or used in an abnormal way; and
 - (3) Documented in terms of total hours of operation, maintenance, operating conditions, and storage.
- (c) Use the following methods to determine the number of engines you must test in each engine family:
 - (1) Test at least two engines if you produce 2,000 or fewer engines in the model year from all engine families, or if you produce 500 or fewer engines from the selected engine family. Otherwise, test at least four engines.
 - (2) If you successfully complete an in-use test program on an engine family and later certify an equivalent

engine family with carryover emission data, as described in §1048.235(c), then test at least one engine instead of the testing rates in paragraph (c)(1) of this section.

(3) If you test the minimum required number of engines and all comply fully with emission standards, you may stop testing.

(4) For each engine that fails any applicable standard, test two more. Regardless of measured emission levels, you do not have to test more than ten engines in an engine family. You may do more tests than we require.

(5) You may concede that the engine family does not comply before testing a total of ten engines.

(d) You may do minimal maintenance to set components of a test engine to specifications for anything we do not consider an adjustable parameter (see §1048.205(p)). Limit maintenance to what is in the owner's instructions for engines with that amount of service and age. Document all maintenance and adjustments.

(e) Do at least one valid exhaust emission test for each test engine.

(f) For a test program on an engine family, choose one of the following methods to test your engines:

(1) Remove the selected engines for testing in a laboratory. Use the applicable steady-state and transient procedures in subpart F of this part to show compliance with the duty-cycle standards in §1048.101(a) and (b). We may direct you to measure emissions on the dynamometer using the supplemental test procedures in §1048.515 to show compliance with the field-testing standards in §1048.101(c).

(2) Test the selected engines while they remain installed in the equipment. Use the field testing procedures in subpart F of this part. Measure emissions during normal operation of the equipment to show compliance with the field-testing standards in §1048.101(c). We may direct you to include specific areas of normal operation.

(g) You may ask us to waive parts of the prescribed test procedures if they are not necessary to determine in-use compliance.

(h) Calculate the average emission levels for an engine family from the results for the set of tested engines. Round them to the number of decimal places in the emission standards expressed to one more decimal place.

§1048.415 What happens if in-use engines do not meet requirements?

(a) Determine the reason each in-use engine exceeds the emission standards.

(b) If the average emission levels calculated in §1048.410(h) exceed any of the emission standards that apply, notify us within fifteen days of completing testing on this family. Otherwise follow the reporting instructions in §1048.420.

(c) We will consider failure rates, average emission levels, and any defects— among other things— to decide on taking remedial action under this subpart (see §1068.505). We may consider the results from any voluntary additional testing you conduct. We may also consider information related to testing from other engine families showing that you designed them to exceed the minimum requirements for controlling emissions. We may order a recall before or after you complete testing of an engine family if we determine a substantial number of engines do not conform to section 213 of the Act or to this part.

(d) If in-use testing reveals a design or manufacturing defect that prevents engines from meeting the requirements of this part, you must correct the defect as soon as possible for any future production for engines in every family affected by the defect.

(e) You may voluntarily recall an engine family for emission failures, as described in 40 CFR 1068.535, unless we have ordered a recall for that family under 40 CFR 1068.505.

(f) You have the right to a hearing before we order you to recall your engines or implement an alternative remedy (see §1048.820).

§1048.420 What in-use testing information must I report to EPA?

- (a) In a report to us within three months after you finish testing an engine family, do all the following:
 - (1) Identify the engine family, model, serial number, and date of manufacture.
 - (2) For each engine inspected or considered for testing, identify whether the diagnostic system was functioning.
 - (3) Describe the specific reasons for disqualifying any engines for not being properly maintained or used.
 - (4) For each engine selected for testing, include the following information:
 - (i) Estimate the hours each engine was used before testing.
 - (ii) Describe all maintenance, adjustments, modifications, and repairs to each test engine.
 - (5) State the date and time of each test attempt.
 - (6) Include the results of all emission testing, including incomplete or invalidated tests, if any.
- (b) Send electronic reports of in-use testing to the Designated Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.
- (c) We will send copies of your reports to anyone from the public who asks for them. See §1048.815 for information on how we treat information you consider confidential.
- (d) We may ask for more information.

§1048.425 What records must I keep?

- (a) Organize and maintain your records as described in this section. We may review your records at any time, so it is important to keep required information readily available.
- (b) Keep paper records of your in-use testing for one full year after you complete all the testing required for an engine family in a model year. You may use any additional storage formats or media if you like.
- (c) Keep a copy of the written reports described in §1048.420.
- (d) Keep any additional records related to the procurement process.

Subpart F—Test Procedures

§1048.501 What procedures must I use to test my engines?

- (a) Use the equipment and procedures for spark-ignition engines in 40 CFR part 1065 to show your engines meet the duty-cycle emission standards in §1048.101(a) and (b). Measure HC, NO_x, CO, and CO₂ emissions using the full-flow dilute sampling procedures in 40 CFR part 1065. Use the applicable duty cycles in §§1048.505 and 1048.510.
- (b) We describe in §1048.515 the supplemental procedures for showing that your engines meet the field-testing emission standards in §1048.101(c).
- (c) Use the fuels specified in 40 CFR part 1065, subpart C, for all the testing we require in this part, except as noted in §1048.515. Use these test fuels or any commercially available fuel for service accumulation.
- (d) To test engines for evaporative emissions, use the equipment and procedures specified for testing diurnal emissions in 40 CFR 86.107-96 and 86.133-96 with fuel meeting the specifications in 40 CFR part 1065, subpart C. Measure emissions from a test engine with a complete fuel system. Reported emission levels must be based on the highest emissions from three successive 24-hour periods of cycling temperatures. Note that you may not be required to test for evaporative emissions during certification if you certify by design, as specified in §1048.245.
- (e) You may use special or alternate procedures, as described in 40 CFR 1065.10.
- (f) We may reject data you generate using alternate procedures if later testing with the procedures in 40 CFR part 1065 shows contradictory emission data.

§1048.505 What steady-state duty cycles apply for laboratory testing?

- (a) Measure emissions by testing the engine on a dynamometer with one or more of the following sets of steady-state duty cycles to show that the engine meets the steady-state standards in §1048.101(b):
 - (1) Use the 7-mode duty cycle described in the following table for engines from an engine family that will be used only in variable-speed applications:

Table 1 of §1048.505—
7-Mode Duty Cycle¹

Mode Number	Engine Speed	Observed Torque ²	Minimum Time in mode (minutes)	Weighting Factors
1	Maximum test speed	25	3.0	0.06
2	Intermediate test speed	100	3.0	0.02
3	Intermediate test speed	75	3.0	0.05
4	Intermediate test speed	50	3.0	0.32
5	Intermediate test speed	25	3.0	0.30
6	Intermediate test speed	10	3.0	0.10
7	Idle	0	3.0	0.15

¹This duty cycle is analogous to the C2 cycle specified in ISO 8178-4.
²The percent torque is relative to the maximum torque at the given engine speed.

(2) Use the 5-mode duty cycle described in the following table if you certify an engine family for operation only at a single, rated speed:

Table 2 of §1048.505—
5-Mode Duty Cycle for Constant-Speed Engines¹

Mode Number	Engine Speed	Torque ²	Minimum Time in mode (minutes)	Weighting Factors
1	Maximum test speed	100	3.0	0.05
2	Maximum test speed	75	3.0	0.25
3	Maximum test speed	50	3.0	0.30
4	Maximum test speed	25	3.0	0.30
5	Maximum test speed	10	3.0	0.10

¹This duty cycle is analogous to the D2 cycle specified in ISO 8178-4.

²The percent torque is relative to the maximum torque at maximum test speed.

(3) Use both of the duty cycles described in paragraphs (a)(1) and (a)(2) of this section if you will not restrict an engine family to constant-speed or variable-speed applications.

(4) Use only the duty cycle specified in paragraph (a)(2) of this section for all severe-duty engines.

(5) Use the 2-mode duty cycle described in the following table for high-load engines instead of the other duty cycles in this paragraph (a):

Table 3 of §1048.505—
2-Mode Duty Cycle for High-Load Engines¹

Mode Number	Engine Speed	Torque ²	Minimum Time in mode (minutes)	Weighting Factors
1	Maximum test speed	100	3.0	0.50
2	Maximum test speed	75	3.0	0.50

¹This duty cycle is derived from the D1 cycle specified in ISO 8178-4.

²The percent torque is relative to the maximum torque at maximum test speed.

(b) If we test an engine to confirm that it meets the duty-cycle emission standards, we will use the steady-state duty cycles that apply for that engine family.

(c) During idle mode, operate the engine with the following parameters:

- (1) Hold the speed within your specifications.
- (2) Keep the throttle at the idle-stop position.
- (3) Keep engine torque under 5 percent of the peak torque value at maximum test speed.

- (d) For the full-load operating mode, operate the engine at wide-open throttle.
- (e) See 40 CFR part 1065 for detailed specifications of tolerances and calculations.
- (f) In the normal test sequence described in 40 CFR part 1065, subpart F, steady-state testing generally follows the transient test. For those cases where we do not require transient testing, perform the steady-state test after an appropriate warm-up period, consistent with good engineering judgment.

§1048.510 What transient duty cycles apply for laboratory testing?

- (a) Starting with the 2007 model year, measure emissions by testing the engine on a dynamometer with one of the following transient duty cycles to show that the engine meets the transient emission standards in §1048.101(a):
 - (1) If you certify an engine family for constant-speed operation only, use the transient duty-cycle described in Appendix I of this part.
 - (2) For all other engines, use the transient duty-cycle described in Appendix II of this part.
- (b) If we test an engine to confirm that it meets the duty-cycle emission standards, we will use the transient duty cycle that applies for that engine family.
- (c) Warm up the test engine as follows:
 - (1) Operate the engine for the first 180 seconds of the appropriate duty cycle, then allow it to idle without load for 30 seconds. At the end of the 30-second idling period, start measuring emissions as the engine operates over the prescribed duty cycle. For severe-duty engines, this engine warm-up procedure may include up to 15 minutes of operation over the appropriate duty cycle.
 - (2) If the engine was already operating before a test, use good engineering judgment to let the engine cool down enough so measured emissions during the next test will accurately represent those from an engine starting at room temperature. For example, if an engine starting at room temperature warms up enough in three minutes to start closed-loop operation and achieve full catalyst activity, then minimal engine cooling is necessary before starting the next test.
 - (3) You are not required to measure emissions while the engine is warming up. However, you must design your emission-control system to start working as soon as possible after engine starting. In your application for certification, describe how your engine meets this objective (see §1048.205(b)).

§1048.515 Field-testing procedures.

- (a) This section describes the procedures to determine whether your engines meet the field-testing emission standards in §1048.101(c). These procedures may include any normal engine operation and ambient conditions that the engines may experience in use. Paragraph (b) of this section defines the limits of what we will consider normal engine operation and ambient conditions. Use the test procedures we specify in §1048.501, except for the provisions we specify in this section. Measure emissions with one of the following procedures:
 - (1) Remove the selected engines for testing in a laboratory. You can use an engine dynamometer to simulate normal operation, as described in this section.
 - (2) Test the selected engines while they remain installed in the equipment. In 40 CFR part 1065, subpart J, we describe the equipment and sampling methods for testing engines in the field. Use fuel meeting the specifications of 40 CFR 1065.210 or a fuel typical of what you would expect the engine to use in service.
- (b) An engine's emissions may not exceed the levels we specify in §1048.101(c) for any continuous sampling period of at least 120 seconds under the following ranges of operation and operating conditions:
 - (1) Engine operation during the emission sampling period may include any normal operation, subject to the

following restrictions:

- (i) Average power must be over 5 percent of maximum brake power.
- (ii) Continuous time at idle must not be greater than 120 seconds.
- (iii) The sampling period may not begin until the engine has reached stable operating temperatures. For example, this would exclude engine operation after starting until the thermostat starts modulating coolant temperature.
- (iv) The sampling period may not include engine starting.
- (v) For engines that qualify for the alternate Tier 2 emission standards in §1048.101(d), operation at 90 percent or more of maximum power must be less than 10 percent of the total sampling time. You may request our approval for a different power threshold.

(2) Engine testing may occur under any normal conditions without correcting measured emission levels, subject to the following restrictions:

- (i) Barometric pressure must be between 80.0 and 103.3 kPa (600 and 775 mm Hg).
- (ii) Ambient air temperature must be between 13° and 35° C.

Subpart G—Compliance Provisions

§1048.601 What compliance provisions apply to these engines?

Engine and equipment manufacturers, as well as owners, operators, and rebuilders of these engines, and all other persons, must observe the requirements and prohibitions in 40 CFR part 1068 and the requirements of the Act. The compliance provisions in this subpart apply only to the engines we regulate in this part.

§1048.605 What are the provisions for exempting engines from the requirements of this part if they are already certified under the motor-vehicle program?

- (a) This section applies to you if you are an engine manufacturer. See §1048.610 if you are not an engine manufacturer.
- (b) The only requirements or prohibitions from this part that apply to an engine that is exempt under this section are in this section.
- (c) If you meet all the following criteria and requirements regarding your new nonroad engine, it is exempt under this section:
 - (1) You must produce it by modifying an engine covered by a valid certificate of conformity under 40 CFR part 86.
 - (2) Do not make any changes to the certified engine that we could reasonably expect to increase its exhaust or evaporative emissions. For example, if you make any of the following changes to one of these engines, you do not qualify for this exemption:
 - (i) Change any fuel system or evaporative system parameters from the certified configuration (this does not apply to refueling emission controls).
 - (ii) Change any other emission-related components.
 - (iii) Modify or design the engine cooling system so that temperatures or heat rejection rates are outside the original engine manufacturer's specified ranges.
 - (3) Demonstrate that fewer than 50 percent of the engine model's total sales, from all companies, are used in nonroad applications.
 - (4) The engine must have the label we require under 40 CFR part 86.
 - (5) Add a permanent supplemental label to the engine in a position where it will remain clearly visible after installation in the equipment. In your engine's emission control information label, do the following:
 - (i) Include the heading: "Nonroad Engine Emission Control Information".
 - (ii) Include your full corporate name and trademark.
 - (iii) State: "THIS ENGINE WAS ADAPTED FOR NONROAD USE WITHOUT AFFECTING ITS EMISSION CONTROLS."
 - (iv) State the date you finished modifying the engine (month and year).
 - (6) The original and supplemental labels must be readily visible after the engine is installed in the equipment or, if the equipment obscures the engine's emission control information label, the equipment manufacturer must attach duplicate labels, as described in 40 CFR 1068.105.
 - (7) Send the Designated Officer a signed letter by the end of each calendar year (or less often if we tell you) with all the following information:
 - (i) Identify your full corporate name, address, and telephone number.

- (ii) List the engine models you expect to produce under this exemption in the coming year.
- (iii) State: "We produce each listed engine model for nonroad application without making any changes that could increase its certified emission levels, as described in 40 CFR 1048.605."
- (d) If your engines do not meet the criteria listed in paragraph (c) of this section, they will be subject to the standards and prohibitions of this part. Producing these engines without a valid exemption or certificate of conformity would violate the prohibitions in 40 CFR 1068.101.
- (e) If you are the original engine manufacturer of both the highway and nonroad versions of an exempted engine, you must send us emission test data on the applicable nonroad duty cycle(s). You may include the data in your application for certification or in your letter requesting the exemption.
- (f) If you are the original engine manufacturer of an exempted engine that is modified by another company under this exemption, we may require you to send us emission test data on the applicable nonroad duty cycle(s). If we ask for this data, we will allow a reasonable amount of time to collect it.
- (g) The engine exempted under this section must meet all applicable requirements from 40 CFR part 86. This applies to engine manufacturers, equipment manufacturers who use these engines, and all other persons as if these engines were used in a motor vehicle.

§1048.610 What are the provisions for producing nonroad equipment with engines already certified under the motor-vehicle program?

If you are not an engine manufacturer, you may produce nonroad equipment from complete or incomplete motor vehicles with the motor vehicle engine if you meet three criteria:

- (a) The engine or vehicle is certified to 40 CFR part 86.
- (b) The engine is not adjusted outside the engine manufacturer's specifications (see §1048.605(c)(2)).
- (c) The engine or vehicle is not modified in any way that may affect its emission control. This applies to exhaust and evaporative emission controls, but not refueling emission controls.

§1048.615 What are the provisions for exempting engines designed for lawn and garden applications?

This section is intended for engines designed for lawn and garden applications, but it applies to any engines meeting the size criteria in paragraph (a) of this section.

- (a) If an engine meets all the following criteria, it is exempt from the requirements of this part:
 - (1) The engine must have a total displacement of 1,000 cc or less.
 - (2) The engine must have a maximum brake power of 30 kW or less.
 - (3) The engine must be in an engine family that has a valid certificate of conformity showing that it meets emission standards for Class II engines under 40 CFR part 90.
- (b) The only requirements or prohibitions from this part that apply to an engine that meets the criteria in paragraph (a) of this section are in this section.
- (c) If your engines do not meet the criteria listed in paragraph (a) of this section, they will be subject to the provisions of this part. Producing these engines without a valid exemption or certificate of conformity would violate the prohibitions in 40 CFR 1068.101.
- (d) Engines exempted under this section are subject to all the requirements affecting engines under 40 CFR part 90. The requirements and restrictions of 40 CFR part 90 apply to anyone manufacturing these engines, anyone manufacturing equipment that uses these engines, and all other persons in the same manner as if these engines had a total maximum brake power at or below 19 kW.

§1048.620 What are the provisions for exempting large engines fueled by natural gas?

- (a) If an engine meets all the following criteria, it is exempt from the requirements of this part:
 - (1) The engine must operate solely on natural gas.
 - (2) The engine must have maximum brake power 250 kW or higher.
 - (3) The engine must be in an engine family that has a valid certificate of conformity showing that it meets emission standards for engines of that power rating under 40 CFR part 89.
- (b) The only requirements or prohibitions from this part that apply to an engine that is exempt under this section are in this section.
- (c) If your engines do not meet the criteria listed in paragraph (a) of this section, they will be subject to the provisions of this part. Producing these engines without a valid exemption or certificate of conformity would violate the prohibitions in 40 CFR 1068.101.
- (d) Engines exempted under this section are subject to all the requirements affecting engines under 40 CFR part 89. The requirements and restrictions of 40 CFR part 89 apply to anyone manufacturing these engines, anyone manufacturing equipment that uses these engines, and all other persons in the same manner as if these were nonroad diesel engines.
- (e) You may request an exemption under this section by submitting an application for certification for the engines under 40 CFR part 89.

§1048.625 What special provisions apply to engines using noncommercial fuels?

If you are unable to meet this part's requirements with engines using noncommercial fuels (such as unrefined natural gas released by oil wells), the following provisions apply for those engines:

- (a) Create a separate engine family.
- (b) Disregard the limits on adjustable parameters in §1048.115(e), but make sure the engines meet emission standards with normal settings when the engine is using fuel meeting the specifications of 40 CFR part 1065, subpart C.
- (c) Add the following information to the emission control information label specified in §1048.135:
 - (1) Include instructions describing how to adjust the engine to operate in a way that maintains the effectiveness of the emission-control system.
 - (2) State: "THIS ENGINE IS CERTIFIED TO OPERATE IN APPLICATIONS USING NONCOMMERCIAL FUEL. USING IT IN AN APPLICATION INVOLVING ONLY COMMERCIAL FUELS MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY."
- (d) Keep records to document the destinations and quantities of engines produced under this section.

Subpart H—[Reserved]

Subpart I—Definitions and Other Reference Information

§1048.801 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Act gives to them. The definitions follow:

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 that someone can adjust (including those which are difficult to access) and that, if adjusted, may affect emissions or engine performance during emission testing or normal in-use operation. You may ask us to exclude a parameter that is difficult to access if it cannot be adjusted to affect emissions without significantly degrading performance, or if you otherwise show us that it will not be adjusted in a way that affects emissions during in-use operation.

Aftertreatment means relating to any system, component, or technology mounted downstream of the exhaust valve or exhaust port whose design function is to reduce exhaust emissions.

Aircraft means any vehicle capable of sustained air travel above treetop heights.

All-terrain vehicle has the meaning we give in 40 CFR 1051.801.

Auxiliary emission-control device means any element of design that senses temperature, engine rpm, motive speed, transmission gear, atmospheric pressure, manifold pressure or vacuum, or any other parameter to activate, modulate, delay, or deactivate the operation of any part of the emission-control system. This also includes any other feature that causes in-use emissions to be higher than those measured under test conditions, except as we allow under this part.

Blue Sky Series engine means an engine meeting the requirements of §1048.140.

Brake power means the usable power output of the engine, not including power required to operate fuel pumps, oil pumps, or coolant pumps.

Broker means any entity that facilitates a trade of emission credits between a buyer and seller.

Calibration means the set of specifications and tolerances specific to a particular design, version, or application of a component or assembly capable of functionally describing its operation over its working range.

Certification means obtaining a certificate of conformity for an engine family that complies with the emission standards and requirements in this part.

Compression-ignition means relating to a type of reciprocating, internal-combustion engine that is not a spark-ignition engine.

Constant-speed engine means an engine governed to operate at a single speed.

Crankcase emissions means airborne substances emitted to the atmosphere from any part of the engine crankcase's ventilation or lubrication systems. The crankcase is the housing for the crankshaft and other related internal parts.

Designated Officer means the Manager, Engine Programs Group (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

Emission-control system means any device, system, or element of design that controls or reduces the regulated emissions from an engine.

Emission-data engine means an engine that is tested for certification.

Emission-related maintenance means maintenance that substantially affects emissions or is likely to substantially affect emissions deterioration.

Engine family means a group of engines with similar emission characteristics, as specified in §1048.230.

Engine manufacturer means the manufacturer of the engine. See the definition of "manufacturer" in this section.

Fuel system means all components involved in transporting, metering, and mixing the fuel from the fuel tank to the combustion chamber(s), including the fuel tank, fuel tank cap, fuel pump, fuel filters, fuel lines, carburetor or fuel-injection components, and all fuel-system vents.

Good engineering judgment has the meaning we give in 40 CFR 1068.5.

High-cost warranted part means a component covered by the emission-related warranty with a replacement cost (at the time of certification) exceeding \$400 (in 1998 dollars). Adjust this value using the most recent annual average consumer price index information published by the U.S. Bureau of Labor Statistics. For this definition, replacement cost includes the retail cost of the part plus labor and standard diagnosis.

High-load engine means an engine for which the engine manufacturer can provide clear evidence that operation below 75 percent of maximum load in its final application will be rare.

Hydrocarbon (HC) means the hydrocarbon group on which the emission standards are based for each fuel type. For gasoline- and LPG-fueled engines, HC means total hydrocarbon (THC). For natural gas-fueled engines, HC means nonmethane hydrocarbon (NMHC). For alcohol-fueled engines, HC means total hydrocarbon equivalent (THCE).

Identification number means a unique specification (for example, model number/serial number combination) that allows someone to distinguish a particular engine from other similar engines.

Intermediate test speed has the meaning we give in 40 CFR 1065.515.

Manufacturer has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures an engine, vehicle, or piece of equipment for sale in the United States or otherwise introduces a new nonroad engine into commerce in the United States. This includes importers who import engines, equipment, or vehicles for resale.

Marine engine means an engine that someone installs or intends to install on a marine vessel. There are two kinds of marine engines:

- (1) Propulsion marine engine means a marine engine that moves a vessel through the water or directs the vessel's movement.
- (2) Auxiliary marine engine means a marine engine not used for propulsion.

Marine vessel means a vehicle that is capable of operation in water but is not capable of operation out of water. Amphibious vehicles are not marine vessels.

Maximum brake power means the maximum brake power an engine produces at maximum test speed.

Maximum test speed has the meaning we give in 40 CFR 1065.515.

Maximum test torque has the meaning we give in 40 CFR 1065.1001.

Model year means one of the following things:

- (1) For freshly manufactured engines (see definition of "new nonroad engine," paragraph (1)), model year means one of the following:
 - (i) Calendar year.
 - (ii) Your annual new model production period if it is different than the calendar year. This must include January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year.
- (2) For an engine that is converted to a nonroad engine after being placed into service in a motor vehicle, model year means the calendar year in which the engine was originally produced (see definition of "new nonroad engine,"

paragraph (2)).

(3) For a nonroad engine excluded under §1048.5 that is later converted to operate in an application that is not excluded, model year means the calendar year in which the engine was originally produced (see definition of “new nonroad engine,” paragraph (3)).

(4) For engines that are not freshly manufactured but are installed in new nonroad equipment, model year means the calendar year in which the engine is installed in the new nonroad equipment. This installation date is based on the time that final assembly of the equipment is complete (see definition of “new nonroad engine,” paragraph (4)).

(5) For an engine modified by an importer (not the original engine manufacturer) who has a certificate of conformity for the imported engine (see definition of “new nonroad engine,” paragraph (5)), model year means one of the following:

(i) The calendar year in which the importer finishes modifying and labeling the engine.

(ii) Your annual production period for producing engines if it is different than the calendar year; follow the guidelines in paragraph (1)(ii) of this definition.

(6) For an engine you import that does not meet the criteria in paragraphs (1) through (5) of the definition of “new nonroad engine,” model year means the calendar year in which the engine manufacturer completed the original assembly of the engine. In general, this applies to used equipment that you import without conversion or major modification.

Motor vehicle has the meaning we give in 40 CFR 85.1703(a). In general, motor vehicle means a self-propelled vehicle that can transport one or more people or any material, but doesn't include any of the following:

(1) Vehicles having a maximum ground speed over level, paved surfaces no higher than 40 km per hour (25 miles per hour).

(2) Vehicles that lack features usually needed for safe, practical use on streets or highways— for example, safety features required by law, a reverse gear (except for motorcycles), or a differential.

(3) Vehicles whose operation on streets or highways would be unsafe, impractical, or highly unlikely. Examples are vehicles with tracks instead of wheels, very large size, or features associated with military vehicles, such as armor or weaponry.

New nonroad engine means any of the following things:

(1) A freshly manufactured nonroad engine for which the ultimate buyer has never received the equitable or legal title. This kind of vehicle might commonly be thought of as "brand new." In the case of this paragraph (1), the engine is no longer new when the ultimate buyer receives this title or the product is placed into service, whichever comes first.

(2) An engine originally manufactured as a motor vehicle engine that is later intended to be used in a piece of nonroad equipment. In this case, the engine is no longer a motor vehicle engine and becomes a "new nonroad engine". The engine is no longer new when it is placed into nonroad service.

(3) A nonroad engine that has been previously placed into service in an application we exclude under §1048.5, where that engine is installed in a piece of equipment for which these exclusions do not apply. The engine is no longer new when it is placed into nonroad service. For example, this would apply to a stationary engine that is no longer used in a stationary application.

(4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in new nonroad equipment. The engine is no longer new when the ultimate buyer receives a title for the equipment or the product is placed into service, whichever comes first. This generally includes installation of used engines in new equipment.

(5) An imported nonroad engine covered by a certificate of conformity issued under this part, where someone other than the original engine manufacturer modifies the engine after its initial assembly and holds the certificate. The engine is no longer new when it is placed into nonroad service.

(6) An imported nonroad engine that is not covered by a certificate of conformity issued under this part at the time of importation. This addresses uncertified engines and vehicles that have been placed into service in other countries and that someone seeks to import into the United States. Importation of this kind of new nonroad engine (or vehicle containing such an engine) is generally prohibited by 40 CFR part 1068.

New nonroad equipment means either of the following things:

(1) A nonroad vehicle or other piece of equipment for which the ultimate buyer has never received the equitable or legal title. The product is no longer new when the ultimate buyer receives this title or the product is placed into service, whichever comes first.

(2) An imported nonroad piece of equipment with an engine not covered by a certificate of conformity issued under this part at the time of importation and manufactured after the date for applying the requirements of this part.

Noncommercial fuel means a fuel that is not marketed or sold as a commercial product. For example, this includes methane produced and released from landfills or oil wells.

Noncompliant engine means an engine that was originally covered by a certificate of conformity, but is not in the certified configuration or otherwise does not comply with the conditions of the certificate.

Nonconforming engine means an engine not covered by a certificate of conformity that would otherwise be subject to emission standards.

Nonmethane hydrocarbon means the difference between the emitted mass of total hydrocarbons and the emitted mass of methane.

Nonroad means relating to nonroad engines or equipment that includes nonroad engines.

Nonroad engine has the meaning given in 40 CFR 1068.30. In general this means all internal- combustion engines except motor vehicle engines, stationary engines, or engines used solely for competition. This part does not apply to all nonroad engines (see §1048.5).

Off-highway motorcycle has the meaning we give in 40 CFR 1051.801. Note: highway motorcycles are regulated under 40 CFR part 86.

Oxides of nitrogen has the meaning given it in 40 CFR part 1065

Placed into service means used for its intended purpose.

Point of first retail sale means the location at which the retail sale occurs. This generally means a dealership.

Revoke means to discontinue the certificate for an engine family. If we revoke a certificate, you must apply for a new certificate before continuing to produce the affected vehicles or engines. This does not apply to vehicles or engines you no longer possess.

Round means to round numbers according to ASTM E29-02 (incorporated by reference in §1048.810), unless otherwise specified.

Scheduled maintenance means adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems that is periodically needed to keep a part from failing or malfunctioning. It also may mean actions you expect are necessary to correct an overt indication of failure or malfunction for which periodic maintenance is not appropriate.

Severe-duty application includes concrete saws, concrete pumps, and any other application where an engine manufacturer can provide clear evidence that the majority of installations need air-cooled engines as a result of operation in a severe-duty environment.

Severe-duty engine means an engine from an engine family in which the majority of engines are installed in severe-duty applications.

Small-volume engine manufacturer means a company with fewer than 200 employees. This includes any employees working for parent or subsidiary companies.

Snowmobile has the meaning we give in 40 CFR 1051.801.

Spark-ignition means relating to a gasoline-fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

Stationary engine means an internal combustion engine that is neither a nonroad engine, nor a motor-vehicle engine, nor an engine used solely for competition (see the definition of nonroad engine in 40 CFR 1068.30). In general this includes fixed engines and all portable or transportable engines that stay in a single site at a building, structure, facility, or installation for at least a full year; this does not include an engine installed in equipment that has the ability to propel itself. For year-round sources, a full year is 12 consecutive months. For seasonal sources, a full year is a full annual operating period of at least three months. A seasonal source is a site with engines operating only part of the year for at least two consecutive years. If you replace an engine with one that does the same or similar work in the same place, you may apply the previous engine's service to your calculation for residence time. If you move a stationary engine anytime in its life after it has been in place for at least a full year, it becomes a nonroad engine subject to emission standards unless it stays at the new location for a full year.

Stoichiometry means the proportion of a mixture of air and fuel such that the fuel is fully oxidized with no remaining oxygen. For example, stoichiometric combustion in gasoline engines typically occurs at an air-fuel mass ratio of about 14.7.

Suspend means to temporarily discontinue the certificate for an engine family. If we suspend a certificate, you may not sell vehicles or engines from that engine family unless we reinstate the certificate or approve a new one.

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.

Total hydrocarbon means the combined mass organic compounds measured by our total hydrocarbon test procedure, expressed as a hydrocarbon with a hydrogen-to-carbon mass ratio of 1.85:1.

Total hydrocarbon equivalent means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, alcohols and aldehydes, or other organic compounds that are measured separately as contained in a gas sample, expressed as petroleum-fueled engine hydrocarbons. The hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

Tier 1 means relating to the emission standards and other requirements that apply beginning with the 2004 model year.

Tier 2 means relating to the emission standards and other requirements that apply beginning with the 2007 model year.

Ultimate buyer means ultimate purchaser.

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

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

Upcoming model year means for an engine family the model year after the one currently in production.

U.S.-directed production volume means the number of engine units, subject to the requirements of this part, produced by a manufacturer for which the manufacturer has a reasonable assurance that sale was or will be made to ultimate buyers in the United States.

Useful life means the period during which the engine is designed to properly function in terms of reliability and fuel consumption, without being remanufactured, specified as a number of hours of operation or calendar years. It is the period during which a new nonroad engine is required to comply with all applicable emission standards. See §1048.101(g).

Variable-speed engine means an engine that is not a constant-speed engine.

Void means to invalidate a certificate or an exemption. If we void a certificate, all the vehicles produced under that engine family for that model year are considered noncompliant, and you are liable for each vehicle produced under the certificate and may face civil or criminal penalties or both. If we void an exemption, all the vehicles produced under that exemption are considered uncertified (or nonconforming), and you are liable for each vehicle produced under the exemption and may face civil or criminal penalties or both. You may not produce any additional vehicles using the voided exemption.

Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure.

Wide-open throttle means maximum throttle opening. Unless this is specified at a given speed, it refers to maximum throttle opening at maximum speed. For electronically controlled or other engines with multiple possible fueling rates, wide-open throttle also means the maximum fueling rate at maximum throttle opening under test conditions.

§1048.805 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part:

° C	degrees Celsius.
ASTM	American Society for Testing and Materials.
cc	cubic centimeters.
CFR	Code of Federal Regulations.
cm	centimeter.
CO	carbon monoxide.
CO ₂	carbon dioxide.
EPA	Environmental Protection Agency.
g/kW-hr	grams per kilowatt-hour.
HC	hydrocarbon.
ISO	International Organization for Standardization.
kPa	kilopascals.
kW	kilowatts.
LPG	liquefied petroleum gas.
m	meters.
MIL	malfunction-indicator light.
mm Hg	millimeters of mercury.
NMHC	nonmethane hydrocarbons.
NO _x	oxides of nitrogen (NO and NO ₂).
psi	pounds per square inch of absolute pressure.
psig	pounds per square inch of gauge pressure.
rpm	revolutions per minute.
SAE	Society of Automotive Engineers.
SI	spark-ignition.

THC total hydrocarbon.
 THCE total hydrocarbon equivalent.
 U.S.C. United States Code.

§1048.810 What materials does this part reference?

We have incorporated by reference the documents listed in this section. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, OAR, Air and Radiation Docket and Information Center, 401 M Street, SW, Washington, DC 20460 or the Office of the Federal Register, 800 N. Capitol St., NW, 7th Floor, Suite 700, Washington, DC.

(a) ASTM material. Table 1 of §1048.810 lists material from the American Society for Testing and Materials that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428. Table 1 follows:

Table 1 of §1048.810—
 ASTM Materials

Document number and name	Part 1048 reference
ASTM E29-02, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.	1048.801

(b) SAE material. Table 2 of §1048.810 lists material from the Society of Automotive Engineering that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096. Table 2 follows:

Table 2 of §1048.810—
 SAE Materials

Document number and name	Part 1048 reference
SAE J2260, Nonmetallic Fuel System Tubing with One or More Layers, November 1996.	1048.105
SAE J1930, Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms, May 1998.	1048.135

(c) ISO material. Table 3 of §1048.810 lists material from the International Organization for Standardization that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the section of this part where we reference it. Anyone may purchase copies of these materials from the International Organization for Standardization, Case Postale 56, CH-1211 Geneva 20, Switzerland. Table 3 follows:

Table 3 of §1048.810—
ISO Materials

Document number and name	Part 1048 reference
ISO 9141-2 Road vehicles—Diagnostic systems— Part 2: CARB requirements for interchange of digital information, February 1994.	1048.110
ISO 14230-4 Road vehicles—Diagnostic systems—Keyword Protocol 2000— Part 4: Requirements for emission-related systems, June 2000.	1048.110

§1048.815 How should I request EPA to keep my information confidential?

- (a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method. We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2.
- (b) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.
- (c) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in 40 CFR 2.204.

§1048.820 How do I request a hearing?

See 40 CFR part 1068, subpart G, for information related to hearings.

Appendix I to Part 1048—Large SI Transient Cycle for Constant-Speed Engines

The following table shows the transient duty-cycle for constant-speed engines, as described in §1048.510:

Time (s)	Normalized Speed	Normalized Torque	62	93%	21%	127	93%	31%
1	58%	5%	63	93%	22%	128	93%	26%
2	58%	5%	64	93%	30%	129	93%	27%
3	58%	5%	65	93%	33%	130	93%	22%
4	58%	5%	66	93%	25%	131	93%	22%
5	58%	5%	67	93%	29%	132	93%	18%
6	58%	5%	68	93%	27%	133	93%	18%
7	58%	5%	69	93%	23%	134	93%	19%
8	58%	5%	70	93%	21%	135	93%	19%
9	58%	5%	71	93%	21%	136	93%	23%
10	58%	5%	72	93%	19%	137	93%	22%
11	58%	5%	73	93%	20%	138	93%	20%
12	65%	8%	74	93%	24%	139	93%	23%
13	72%	9%	75	93%	23%	140	93%	20%
14	79%	12%	76	93%	21%	141	93%	18%
15	86%	14%	77	93%	44%	142	93%	18%
16	93%	16%	78	93%	34%	143	93%	16%
17	93%	16%	79	93%	28%	144	93%	19%
18	93%	16%	80	93%	37%	145	94%	25%
19	93%	16%	81	93%	29%	146	93%	30%
20	93%	16%	82	93%	27%	147	93%	29%
21	93%	16%	83	93%	33%	148	93%	23%
22	93%	16%	84	93%	28%	149	93%	24%
23	93%	16%	85	93%	22%	150	93%	22%
24	93%	31%	86	96%	30%	151	94%	20%
25	93%	30%	87	95%	25%	152	93%	17%
26	93%	27%	88	95%	17%	153	93%	16%
27	93%	23%	89	95%	13%	154	93%	16%
28	93%	24%	90	95%	10%	155	93%	15%
29	93%	21%	91	95%	9%	156	93%	17%
30	93%	20%	92	95%	8%	157	93%	18%
31	93%	18%	93	95%	7%	158	93%	20%
32	93%	16%	94	95%	7%	159	93%	21%
33	93%	18%	95	95%	6%	160	93%	18%
34	93%	16%	96	95%	6%	161	93%	17%
35	93%	17%	97	93%	37%	162	92%	54%
36	93%	20%	98	93%	35%	163	93%	38%
37	93%	20%	99	93%	29%	164	93%	29%
38	93%	22%	100	93%	23%	165	93%	24%
39	93%	20%	101	93%	23%	166	93%	24%
40	93%	17%	102	93%	21%	167	93%	24%
41	93%	17%	103	93%	20%	168	93%	23%
42	93%	17%	104	93%	29%	169	93%	20%
43	93%	16%	105	93%	27%	170	93%	20%
44	93%	18%	106	93%	26%	171	93%	18%
45	93%	18%	107	93%	35%	172	93%	19%
46	93%	21%	108	93%	43%	173	93%	19%
47	93%	21%	109	95%	35%	174	93%	16%
48	93%	18%	110	95%	24%	175	93%	16%
49	94%	24%	111	95%	17%	176	93%	16%
50	93%	28%	112	95%	13%	177	93%	18%
51	93%	23%	113	95%	10%	178	93%	21%
52	93%	19%	114	95%	9%	179	93%	20%
53	93%	20%	115	95%	8%	180	93%	20%
54	93%	20%	116	95%	7%	181	93%	17%
55	93%	29%	117	95%	7%	182	93%	19%
56	93%	23%	118	95%	6%	183	93%	17%
57	93%	25%	119	93%	36%	184	93%	18%
58	93%	23%	120	93%	30%	185	93%	16%
59	93%	23%	121	93%	25%	186	93%	16%
60	93%	23%	122	93%	21%	187	93%	16%
61	93%	22%	123	93%	22%	188	93%	17%
			124	93%	19%	189	93%	16%
			125	93%	34%	190	93%	17%
			126	93%	36%	191	93%	18%

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200	95%	16%
201	95%	12%
202	95%	10%
203	96%	8%
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205	95%	7%
206	96%	7%
207	95%	6%
208	96%	6%
209	96%	6%
210	88%	6%
211	89%	48%
212	93%	34%
213	93%	27%
214	93%	26%
215	93%	25%
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249	95%	10%
250	95%	9%
251	95%	8%
252	96%	7%
253	95%	7%
254	95%	6%
255	92%	42%
256	93%	36%
257	93%	33%
258	92%	60%
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619	98%	13%
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690	81%	5%
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710	95%	23%
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714	95%	18%
715	94%	22%
716	95%	19%
717	95%	23%
718	95%	27%
719	95%	26%
720	95%	23%
721	95%	20%
722	99%	23%
723	98%	20%
724	98%	14%
725	98%	11%
726	98%	9%
727	98%	8%
728	98%	7%
729	98%	6%
730	98%	6%
731	98%	6%
732	98%	5%
733	98%	5%
734	73%	6%
735	49%	5%

736	50%	77%
737	95%	39%
738	95%	30%
739	95%	28%
740	94%	31%
741	95%	36%
742	95%	36%
743	95%	30%
744	95%	26%
745	95%	27%
746	95%	22%
747	95%	18%
748	95%	19%
749	95%	25%
750	94%	25%
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779	94%	35%
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782	95%	24%
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803	95%	18%

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837	95%	17%
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839	94%	17%
840	95%	19%
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843	94%	18%
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847	94%	19%
848	95%	20%
849	95%	23%
850	98%	23%
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853	98%	12%
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856	98%	7%
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865	51%	5%
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869	51%	6%
870	51%	5%
871	51%	6%

872	51%	7%
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874	94%	44%
875	94%	34%
876	94%	41%
877	95%	44%
878	94%	32%
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880	94%	20%
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897	95%	30%
898	95%	24%
899	95%	19%
900	94%	17%
901	94%	16%
902	98%	19%
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904	98%	12%
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933	95%	34%
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936	95%	29%
937	94%	28%
938	95%	24%
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946	94%	19%
947	98%	21%
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978	51%	6%
979	72%	58%
980	94%	36%
981	95%	28%
982	95%	24%
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984	95%	26%
985	94%	30%
986	94%	26%
987	95%	34%
988	95%	57%
989	95%	45%
990	94%	37%
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993	95%	27%
994	95%	29%
995	98%	22%
996	94%	84%
997	94%	74%
998	95%	62%
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1000	95%	50%
1001	95%	81%
1002	94%	65%
1003	95%	49%
1004	94%	56%
1005	95%	65%
1006	94%	59%
1007	99%	58%

1008	98%	41%
1009	98%	27%
1010	98%	19%
1011	98%	13%
1012	98%	11%
1013	98%	9%
1014	98%	8%
1015	98%	7%
1016	98%	6%
1017	98%	6%
1018	98%	6%
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1069	98%	7%
1070	98%	6%
1071	98%	6%
1072	98%	6%
1073	98%	5%
1074	89%	6%
1075	49%	5%

1076	51%	6%
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1080	51%	6%
1081	51%	6%
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1115	98%	57%
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1118	93%	63%
1119	94%	59%
1120	98%	100%
1121	94%	73%
1122	98%	53%
1123	94%	76%
1124	95%	61%
1125	94%	49%
1126	94%	37%
1127	97%	50%
1128	98%	36%
1129	98%	25%
1130	98%	18%
1131	98%	12%
1132	98%	10%
1133	98%	8%
1134	98%	7%
1135	98%	7%
1136	98%	6%
1137	98%	6%
1138	98%	6%
1139	80%	6%
1140	49%	6%
1141	78%	61%
1142	95%	50%
1143	94%	43%

1144	94%	42%
1145	94%	31%
1146	95%	30%
1147	95%	34%
1148	95%	28%
1149	95%	27%
1150	94%	27%
1151	95%	31%
1152	95%	42%
1153	94%	41%
1154	95%	37%
1155	95%	43%
1156	95%	34%
1157	95%	31%
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1170	95%	51%
1171	94%	55%
1172	95%	48%
1173	95%	35%
1174	95%	39%
1175	95%	39%
1176	94%	41%
1177	95%	30%
1178	95%	23%
1179	94%	19%
1180	95%	25%
1181	94%	29%
1182	98%	27%
1183	95%	89%
1184	95%	74%
1185	94%	60%
1186	94%	48%
1187	94%	41%
1188	94%	29%
1189	94%	24%
1190	95%	19%
1191	94%	21%
1192	95%	29%
1193	95%	28%
1194	95%	27%
1195	94%	23%
1196	95%	25%
1197	95%	26%
1198	94%	22%
1199	95%	19%
1200	94%	17%

Appendix II to Part 1048—Large SI Composite Transient Cycle

The following table shows the transient duty-cycle for engines that are not constant-speed engines, as described in §1048.510:

Time (s)	Normalized Speed	Normalized Torque						
0	0%	0%	61	55%	43%	124	100%	27%
1	0%	0%	62	59%	38%	125	100%	79%
2	0%	0%	63	44%	28%	126	100%	79%
3	0%	0%	64	24%	37%	127	100%	81%
4	0%	0%	65	12%	44%	128	100%	57%
5	0%	0%	66	9%	47%	129	99%	52%
6	0%	0%	67	12%	52%	130	81%	35%
7	0%	0%	68	34%	21%	131	69%	29%
8	0%	0%	69	29%	44%	132	47%	22%
9	1%	8%	70	44%	54%	133	34%	28%
10	6%	54%	71	54%	62%	134	27%	37%
11	8%	61%	72	62%	57%	135	83%	60%
12	34%	59%	73	72%	56%	136	100%	74%
13	22%	46%	74	88%	71%	137	100%	7%
14	5%	51%	75	100%	69%	138	100%	2%
15	18%	51%	76	100%	34%	139	70%	18%
16	31%	50%	77	100%	42%	140	23%	39%
17	30%	56%	78	100%	54%	141	5%	54%
18	31%	49%	79	100%	58%	142	11%	40%
19	25%	66%	80	100%	38%	143	11%	34%
20	58%	55%	81	83%	17%	144	11%	41%
21	43%	31%	82	61%	15%	145	19%	25%
22	16%	45%	83	43%	22%	146	16%	32%
23	24%	38%	84	24%	35%	147	20%	31%
24	24%	27%	85	16%	39%	148	21%	38%
25	30%	33%	86	15%	45%	149	21%	42%
26	45%	65%	87	32%	34%	150	9%	51%
27	50%	49%	88	14%	42%	151	4%	49%
28	23%	42%	89	8%	48%	152	2%	51%
29	13%	42%	90	5%	51%	153	1%	58%
30	9%	45%	91	10%	41%	154	21%	57%
31	23%	30%	92	12%	37%	155	29%	47%
32	37%	45%	93	4%	47%	156	33%	45%
33	44%	50%	94	3%	49%	157	16%	49%
34	49%	52%	95	3%	50%	158	38%	45%
35	55%	49%	96	4%	49%	159	37%	43%
36	61%	46%	97	4%	48%	160	35%	42%
37	66%	38%	98	8%	43%	161	39%	43%
38	42%	33%	99	2%	51%	162	51%	49%
39	17%	41%	100	5%	46%	163	59%	55%
40	17%	37%	101	8%	41%	164	65%	54%
41	7%	50%	102	4%	47%	165	76%	62%
42	20%	32%	103	3%	49%	166	84%	59%
43	5%	55%	104	6%	45%	167	83%	29%
44	30%	42%	105	3%	48%	168	67%	35%
45	44%	53%	106	10%	42%	169	84%	54%
46	45%	56%	107	18%	27%	170	90%	58%
47	41%	52%	108	3%	50%	171	93%	43%
48	24%	41%	109	11%	41%	172	90%	29%
49	15%	40%	110	34%	29%	173	66%	19%
50	11%	44%	111	51%	57%	174	52%	16%
51	32%	31%	112	67%	63%	175	49%	17%
52	38%	54%	113	61%	32%	176	56%	38%
53	38%	47%	114	44%	31%	177	73%	71%
54	9%	55%	115	48%	54%	178	86%	80%
55	10%	50%	116	69%	65%	179	96%	75%
56	33%	55%	117	85%	65%	180	89%	27%
57	48%	56%	118	81%	29%	181	66%	17%
58	49%	47%	119	74%	21%	182	50%	18%
59	33%	44%	120	62%	23%	183	36%	25%
60	52%	43%	121	76%	58%	184	36%	24%
			122	96%	75%	185	38%	40%
			123	100%	77%	186	40%	50%

187	27%	48%	255	100%	66%	323	50%	50%
188	19%	48%	256	100%	85%	324	11%	53%
189	23%	50%	257	100%	72%	325	12%	45%
190	19%	45%	258	100%	45%	326	5%	50%
191	6%	51%	259	98%	58%	327	1%	55%
192	24%	48%	260	60%	30%	328	7%	55%
193	49%	67%	261	43%	32%	329	62%	60%
194	47%	49%	262	71%	36%	330	80%	28%
195	22%	44%	263	44%	32%	331	23%	37%
196	25%	40%	264	24%	38%	332	39%	58%
197	38%	54%	265	42%	17%	333	47%	24%
198	43%	55%	266	22%	51%	334	59%	51%
199	40%	52%	267	13%	53%	335	58%	68%
200	14%	49%	268	23%	45%	336	36%	52%
201	11%	45%	269	29%	50%	337	18%	42%
202	7%	48%	270	28%	42%	338	36%	52%
203	26%	41%	271	21%	55%	339	59%	73%
204	41%	59%	272	34%	57%	340	72%	85%
205	53%	60%	273	44%	47%	341	85%	92%
206	44%	54%	274	19%	46%	342	99%	90%
207	22%	40%	275	13%	44%	343	100%	72%
208	24%	41%	276	25%	36%	344	100%	18%
209	32%	53%	277	43%	51%	345	100%	76%
210	44%	74%	278	55%	73%	346	100%	64%
211	57%	25%	279	68%	72%	347	100%	87%
212	22%	49%	280	76%	63%	348	100%	97%
213	29%	45%	281	80%	45%	349	100%	84%
214	19%	37%	282	83%	40%	350	100%	100%
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1207	0%	0%
1208	0%	0%
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PART 1051—CONTROL OF EMISSIONS FROM RECREATIONAL ENGINES AND VEHICLES

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Authority: 42 U.S.C. 7401 - 7671(q).

Subpart A—Determining How to Follow This Part

§1051.1 Does this part apply to me?

- (a) This part applies to you if you manufacture or import any of the following recreational vehicles or engines used in them, unless we exclude them under §1051.5:
- (1) Snowmobiles.
 - (2) Off-highway motorcycles.
 - (3) All-terrain vehicles (ATVs).
 - (4) Offroad utility vehicles with engines with displacement less than or equal to 1000 cc, maximum brake power less than or equal to 30 kW, and maximum vehicle speed of 25 miles per hour or higher. Offroad utility vehicles that are subject to this part are subject to the same requirements as ATVs. This means that any requirement that applies to ATVs also applies to these offroad utility vehicles, without regard to whether the regulatory language mentions offroad utility vehicles.
- (b) [Reserved]
- (c) As noted in subpart G of this part, 40 CFR part 1068 applies to everyone, including anyone who manufactures, installs, owns, operates, or rebuilds any of the vehicles or engines this part covers.
- (d) You need not follow this part for vehicles you produce before the 2006 model year, unless you certify voluntarily. See §§1051.103 through 1051.110, §1051.145, and the definition of "model year" in §1051.801 for more information about the timing of the requirements.
- (e) The requirements of this part begin to apply when a vehicle is new. See the definition of "new" in §1051.801 for more information. In some cases, vehicles or engines that have been previously used may be considered "new" for the purposes of this part.
- (f) See §§1051.801 and 1051.805 for definitions and acronyms that apply to this part. The definition section contains significant regulatory provisions and it is very important that you read them.

§1051.5 Which engines are excluded or exempted from this part's requirements?

- (a) You may exclude vehicles with compression-ignition engines. See 40 CFR part 89 for regulations that cover these engines.
- (b) See subpart G of this part and 40 CFR part 1068, subpart C, for exemptions of specific engines.
- (c) We may require you to label an engine or vehicle (or both) if this section excludes it and other requirements in this chapter do not apply.
- (d) Send the Designated Officer a written request with supporting documentation if you want us to determine whether this part covers or excludes certain vehicles. Excluding engines from this part's requirements does not affect other requirements that may apply to them.

§1051.10 What main steps must I take to comply with this part?

- (a) You must get a certificate of conformity from us for each engine family before you do any of the following things with a new vehicle or new engine covered by this part: sell, offer for sale, introduce into commerce, distribute or deliver for introduction into commerce, or import it into the United States. "New" vehicles or engines may include

some already placed in service (see the definition of “new” in §1051.801). You must get a new certificate of conformity for each new model year.

- (b) To get a certificate of conformity and comply with its terms, you must do five things:
 - (1) Meet the emission standards and other requirements in subpart B of this part.
 - (2) Perform preproduction emission tests.
 - (3) Apply for certification (see subpart C of this part).
 - (4) Do routine emission testing on production vehicles or engines as required by subpart D of this part.
 - (5) Follow our instructions throughout this part.
- (c) Subpart F of this part describes how to test your engines or vehicles (including references to other parts) and when you may test the engine alone instead of the entire vehicle.
- (d) Subpart G of this part and 40 CFR part 1068 describe requirements and prohibitions that apply to manufacturers, owners, operators, rebuilders, and all others. They also describe exemptions available for special circumstances.

§1051.15 Do any other regulation parts affect me?

- (a) Parts 86 and 1065 of this chapter describe procedures and equipment specifications for testing vehicles and engines. Subpart F of this part describes how to apply part 86 or 1065 of this chapter to show you meet the emission standards in this part.
- (b) Part 1068 of this chapter describes general provisions, including these seven areas:
 - (1) Prohibited actions and penalties for manufacturers and others.
 - (2) Rebuilding and other aftermarket changes.
 - (3) Exemptions and exclusions for certain vehicles and engines.
 - (4) Importing vehicles and engines.
 - (5) Selective enforcement audits of your production.
 - (6) Defect reporting and recall.
 - (7) Procedures for hearings.
- (c) Other parts of this chapter affect you if referenced in this part.

§1051.20 May I certify a recreational engine instead of the vehicle?

- (a) You may certify engines sold separately from vehicles in either of two cases:
 - (1) If you manufacture recreational engines but not recreational vehicles, you may ask to certify the engine alone. In your request, explain why you cannot certify the entire vehicle.
 - (2) If you manufacture complete recreational vehicles containing engines you also sell separately, you may ask to certify all these engines in a single engine family or in separate engine families.
- (b) If you certify an engine under this section, you must use the test procedures in subpart F of this part. If the test procedures require vehicle testing, use good engineering judgment to install the engine in an appropriate vehicle for measuring emissions.
- (c) If we allow you to certify recreational engines, the vehicles must meet the applicable emission standards (including evaporative emission standards) with the engines installed in the appropriate vehicles. You must prepare installation instructions as described in §1051.130 and use good engineering judgment so that the engines will meet emission standards after proper installation in the vehicle.
- (d) Identify and label engines you produce under this section consistent with the requirements of §1051.135. On the emission control information label, identify the manufacturing date of the engine rather than the vehicle.

(e) You may not use the provisions of this section to circumvent or reduce the stringency of this part's standards or other requirements.

(f) If you certify under paragraph (a)(1) of this section, you may ask us to allow you perform production-line testing on the engine. If you certify under paragraph (a)(2) of this section, use good engineering judgment to ensure that these engines are produced in the same manner as the engines you produce for your vehicles, so that your production-line testing results under subpart D of this part would apply to them.

§1051.25 What requirements apply when installing certified engines in recreational vehicles?

(a) If you manufacture recreational vehicles with engines certified under §1051.20, you need not also certify the vehicle under this part. The vehicle must nevertheless meet emission standards with the engine installed.

(b) You must follow the engine manufacturer's emission-related installation instructions, as described in §1051.135 and 40 CFR 1068.105. For example, you must use a fuel system that meets the permeation requirements of this part, consistent with the engine manufacturer's instructions.

(c) If you install the engine in a way that makes the engine's emission control information label hard to read during normal engine maintenance, you must place a duplicate label on the vehicle, as described in 40 CFR 1068.105.

Subpart B—Emission Standards and Related Requirements

§1051.101 What emission standards and other requirements must my vehicles meet?

- (a) You must show that your vehicles meet the following:
 - (1) The applicable exhaust emission standards in §1051.103, §1051.105, or §1051.107.
 - (i) For snowmobiles, see §1051.103.
 - (ii) For off-highway motorcycles, see §1051.105.
 - (iii) For all-terrain vehicles and offroad utility vehicles subject to this part, see §1051.107.
 - (2) The evaporative emission standards in §1051.110.
 - (3) All the requirements in §1051.115.
- (b) The certification regulations in subpart C of this part describe how you make this showing.
- (c) These standards and requirements apply to all testing, including production-line and in-use testing, as described in subparts D and E of this part.
- (d) Other sections in this subpart describe other requirements for manufacturers such as labeling or warranty requirements.
- (e) It is important that you read §1051.145 to determine if there are other interim requirements or interim compliance options that apply for a limited time.
- (f) As is described in §1051.1(a)(4), offroad utility vehicles that are subject to this part are subject to the same requirements as ATVs.

§1051.103 What are the exhaust emission standards for snowmobiles?

- (a) Apply the exhaust emission standards in this section by model year. Measure emissions with the snowmobile test procedures in subpart F of this part.
 - (1) Follow Table 1 of this section for exhaust emission standards. You may use the averaging, banking, and trading provisions of subpart H of this part to show compliance with these standards (an engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meet the applicable emission standards using emission credits, and the vehicles within the family meet the family emission limit). Table 1 also shows the maximum value you may specify for a family emission limit, as follows:

Table 1 of §1051.103—
Exhaust Emission Standards for Snowmobiles (g/kW-hr)

Phase	Model Year	Phase-in	Emission standards			Maximum allowable Family Emission Limits		
			HC	HC+NOx	CO	HC	HC+NOx	CO
Phase 1	2006	50%	100	--	275	--	--	--
Phase 1	2007 - 2009	100%	100	--	275	--	--	--
Phase 2	2010 & 2011	100%	75	--	275	--	--	--
Phase 3	2012 and later	100%	75	See §1051.103(a)(2)		150	165	400

- (2) For Phase 3, the HC+NOx and CO standards defined by a functional relationship. Choose your corporate

average HC+NO_x and CO standards for each model year according to the following criteria:

- (i) Prior to production, select the HC+NO_x standard and CO standard (specified as g/kW-hr) so that the combined percent reduction from baseline emission levels is greater than or equal to 100 percent; that is, that the standards comply with the following equation:

$$\left(1 - \frac{(HC + NO_x)_{STD} - 15}{150}\right) \times 100 + \left(1 - \frac{CO_{STD}}{400}\right) \times 100 \geq 100$$

- (ii) Your corporate average HC+NO_x standard may not be higher than 90 g/kW-hr.
- (iii) Your corporate average CO standard may not be higher than 275 g/kW-hr.
- (iv) You may use the averaging and banking provisions of subpart H of this part to show compliance with these HC+NO_x and CO standards in this paragraph (a)(2). You may modify your selection of the HC+NO_x and CO standards at the end of the model year under paragraph (a)(2)(i) of this section. You must comply with these final corporate average emission standards.

(b) Apply the exhaust emission standards in this section for snowmobiles using each type of fuel specified in 40 CFR 1065, subpart C for which they are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for snowmobiles powered by the following fuels:

- (1) Gasoline- and LPG-fueled snowmobiles: THC emissions.
- (2) Natural gas-fueled snowmobiles: NMHC emissions.
- (3) Alcohol-fueled snowmobiles: THCE emissions.

(c) Your snowmobiles must meet emission standards over their full useful life (§1051.240 describes how to use deterioration factors to show this). The minimum useful life is 8,000 kilometers, 400 hours of engine operation, or five calendar years, whichever comes first. You must specify a longer useful life in terms of kilometers and hours for the engine family if the average service life of your vehicles is longer than the minimum value, as follows:

- (1) Except as allowed by paragraph (c)(2) of this section, your useful life (in kilometers and hours) may not be less than either of the following:

- (i) Your projected operating life from advertisements or other marketing materials for any vehicles in the engine family.

- (ii) Your basic mechanical warranty for any engines in the engine family.

- (2) Your useful life may be based on the average service life of vehicles in the engine family if you show that the average service life is less than the useful life required by paragraph (c)(1) of this section, but more than the minimum useful life (8,000 kilometers or 400 hours of engine operation). In determining the actual average service life of vehicles in an engine family, we will consider all available information and analyses. Survey data is allowed but not required to make this showing.

§1051.105 What are the exhaust emission standards for off-highway motorcycles?

(a) Apply the exhaust emission standards in this section by model year. Measure emissions with the off-highway motorcycle test procedures in subpart F of this part.

(1) Follow Table 1 of this section for exhaust emission standards. You may use the averaging, banking, and trading provisions of subpart H of this part to show compliance with the HC+NO_x and/or CO standards (an engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meet the applicable emission standards using emission credits, and the vehicles within the family meet the family emission limit). The phase-in values specify the percentage of your U.S.-directed production that must comply with the emission standards for those model years. Calculate this compliance percentage based on a simple count of production units within the engine family. Table 1 follows:

Table 1 of §1051.105—
Exhaust Emission Standards
for Off-Highway Motorcycles (g/km)

Phase	Model Year	Phase-in	Emission standards		Maximum allowable Family Emission Limits	
			HC+NO _x	CO	HC+NO _x	CO
Phase 1	2006	50%	2.0	25	20.0	50
	2007 and later	100%	2.0	25	20.0	50

(2) For model years 2007 and later you may choose to certify all of your off-highway motorcycles to an HC+NO_x standard of 4.0 g/km and a CO standard of 35 g/km, instead of the standards listed in paragraph (a)(1) of this section. To certify to the standards in this paragraph (a)(2) of this section, you must comply with the following provisions:

- (i) You may not request an exemption for any off-highway motorcycles under §1051.620
- (ii) At least ten percent of your off-highway motorcycles for the model year must have four of the following features:
 - (A) The absence of a headlight or other lights.
 - (B) The absence of a spark arrestor.
 - (C) The absence of manufacturer warranty.
 - (D) Suspension travel greater than 10 inches.
 - (E) Engine displacement greater than 50 cc.
 - (F) The absence of a functional seat.
- (iii) You may use the averaging and banking provisions of subpart H of this part to show compliance with this HC+NO_x standard, but not this CO standard. If you use the averaging or banking provisions to show compliance, your FEL for HC+NO_x may not exceed 8.0 g/km for any engine family. You may not use the trading provisions of subpart H of this part.

(3) You may certify off-highway motorcycles with engines that have total displacement of 70 cc or less to the exhaust emission exhaust standards in §1051.615 instead of certifying them to the exhaust emission standards of this section.

(b) Apply the exhaust emission standards in this section for off-highway motorcycles using each type of fuel specified in 40 CFR 1068, subpart C for which they are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for off-highway

motorcycles powered by the following fuels:

- (1) Gasoline- and LPG-fueled off-highway motorcycles: THC emissions.
- (2) Natural gas-fueled off-highway motorcycles: NMHC emissions.
- (3) Alcohol-fueled off-highway motorcycles: THCE emissions.

(c) Your off-highway motorcycles must meet emission standards over their full useful life (§1051.240 describes how to use deterioration factors to show this). The minimum useful life is 10,000 kilometers or five years, whichever comes first. You must specify a longer useful life for the engine family in terms of kilometers if the average service life of your vehicles is longer than the minimum value, as follows:

(1) Except as allowed by paragraph (c)(2) of this section, your useful life (in kilometers) may not be less than either of the following:

(i) Your projected operating life from advertisements or other marketing materials for any vehicles in the engine family.

(ii) Your basic mechanical warranty for any engines in the engine family.

(2) Your useful life may be based on the average service life of vehicles in the engine family if you show that the average service life is less than the useful life required by paragraph (c)(1) of this section, but more than the minimum useful life (10,000 kilometers). In determining the actual average service life of vehicles in an engine family, we will consider all available information and analyses. Survey data is allowed but not required to make this showing.

§1051.107 What are the exhaust emission standards for all-terrain vehicles (ATVs) and offroad utility vehicles?

This section specifies the exhaust emission standards that apply to ATVs. As is described in §1051.1(a)(4), offroad utility vehicles that are subject to this part are subject to these same standards.

(a) Apply the exhaust emission standards in this section by model year. Measure emissions with the ATV test procedures in subpart F of this part.

(1) Follow Table 1 of this section for exhaust emission standards. You may use the averaging, banking, and trading provisions of subpart H of this part to show compliance with these HC+NO_x standards (an engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meet the applicable emission standards using emission credits, and the vehicles within the family meet the family emission limit). Table 1 also shows the maximum value you may specify for a family emission limit. The phase-in values in the table specify the percentage of your total U.S.-directed production that must comply with the emission standards for those model years.

Calculate this compliance percentage based on a simple count of production units within the engine family. This applies to your total production of ATVs and offroad utility vehicles that are subject to the standards of this part; including both ATVs and offroad utility vehicles subject to the standards of this section and ATVs and offroad utility vehicles certified to the standards of other sections in this part 1051 (such as §1051.615, but not including vehicles certified under other parts in this chapter (such as 40 CFR part 90). Table 1 follows:

Table 1 of §1051.107—
Exhaust Emission Standards for ATVs (g/km)

Phase	Model Year	Phase-in	Emission standards		Maximum allowable Family Emission Limits	
			HC+NO _x	CO	HC+NO _x	CO
Phase 1	2006	50%	1.5	35	20.0	50
	2007 and later	100%	1.5	35	20.0	50

(2) You may certify ATVs with engines that have total displacement of less than 100 cc to the exhaust emission standards in §1051.615 instead of certifying them to the exhaust emission standards of this section.

(b) Apply the exhaust emission standards in this section for ATVs using each type of fuel specified in 40 CFR 1065, subpart C for which they are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for ATVs powered by the following fuels:

- (1) Gasoline- and LPG-fueled ATVs: THC emissions.
- (2) Natural gas-fueled ATVs: NMHC emissions.
- (3) Alcohol-fueled ATVs: THCE emissions.

(c) Your ATVs must meet emission standards over their full useful life (§1051.240 describes how to use deterioration factors to show this). The minimum useful life is 10,000 kilometers, 1000 hours of engine operation, or five years, whichever comes first. You must specify a longer useful life for the engine family in terms of kilometers and hours if the average service life of your vehicles is longer than the minimum value, as follows:

(1) Except as allowed by paragraph (c)(2) of this section, your useful life (in kilometers) may not be less than either of the following:

- (i) Your projected operating life from advertisements or other marketing materials for any vehicles in the engine family.
- (ii) Your basic mechanical warranty for any engines in the engine family.

(2) Your useful life may be based on the average service life of vehicles in the engine family if you show that the average service life is less than the useful life required by paragraph (c)(1) of this section, but more than the minimum useful life (10,000 kilometers or 1,000 hours of engine operation). In determining the actual average service life of vehicles in an engine family, we will consider all available information and analyses. Survey data is allowed but not required to make this showing.

§1051.110 What evaporative emission standards must my vehicles meet?

All of your new vehicles must meet the emission standards of this section over their full useful life, as specified in this section. Note that §1051.245 allows you to use design-based certification instead of generating new emission data.

(a) Beginning with the 2008 model year, permeation emissions from your vehicle's fuel tank(s) may not exceed 1.5 grams per square-meter per day when measured with the test procedures for tank permeation in subpart F of this part. You may use the averaging, banking, and trading provisions of subpart H of this part to show compliance.

(b) Beginning with the 2008 model year, permeation emissions from your vehicle's fuel lines may not exceed 15 grams per square-meter per day when measured with the test procedures for fuel-line permeation in subpart F of this part. Use the inside diameter of the hose to determine the surface area of the hose.

§1051.115 What other requirements must my vehicles meet?

Your vehicles must meet the following requirements:

(a) Closed crankcase. Design and produce your vehicles so they release no crankcase emissions into the atmosphere throughout their useful life.

(b) Emission sampling capability. Produce all your vehicles to allow sampling of exhaust emissions in the field without damaging the vehicle. Show in your application for certification how this can be done in a way that prevents diluting the exhaust sample with ambient air. To do this, you might simply allow for extending the exhaust pipe by 20 cm; you might also install sample ports in the exhaust (downstream of any aftertreatment devices).

(c) Adjustable parameters. If your vehicles have adjustable parameters, they must meet all the requirements of this part for any adjustment in the physically adjustable range. Note that parameters that control the air-fuel ratio may be treated separately under paragraph (d) of this section.

(1) We do not consider an operating parameter adjustable if you permanently seal it or if ordinary tools cannot readily access it.

(2) We may require you to adjust the engine to any specification within the adjustable range during certification testing, production-line testing, selective enforcement auditing, or in-use testing.

(d) Other adjustments. This provision applies if an experienced mechanic can change your engine's air-fuel ratio in less than one hour with a few parts whose total cost is under \$50 (in 2001 dollars). Examples include carburetor jets and needles. In the case of carburetor jets and needles, your vehicle must meet all the requirements of this part for any air-fuel ratio within the adjustable range described in paragraph (d)(1) of this section.

(1) In your application for certification, specify the adjustable range of air-fuel ratios you expect to occur in use. You may specify it in terms of engine parts (such as the carburetor jet size and needle configuration as a function of atmospheric conditions).

(2) This adjustable range (specified in paragraph (d)(1) of this section) must include all air-fuel ratios between the lean limit and the rich limit, unless you can show that some air-fuel ratios will not occur in use.

(i) The lean limit is the air-fuel ratio that produces the highest engine power output (averaged over the test cycle).

(ii) The rich limit is the richest of the following air-fuel ratios:

(A) The air-fuel ratio that would result from operating the vehicle as you produce it at the specified test conditions. This paragraph (d)(2)(ii)(A) does not apply if you produce the vehicle with an unjetted carburetor so that the vehicle must be jetted by the dealer or operator.

(B) The air-fuel ratio of the engine when you do durability testing.

(C) The richest air-fuel ratio that you recommend to your customers for the applicable ambient conditions.

(3) If the air-fuel ratio of your vehicle is adjusted primarily by changing the carburetor jet size and/or needle configuration, you may submit your recommended jetting chart instead of the range of air-fuel ratios required by paragraph (d)(1) of this section if the following criteria are met:

(i) Good engineering judgment indicates that vehicle operators would not have an incentive to operate the vehicle with richer air-fuel ratios than recommended.

(ii) The chart is based on use of a fuel that is equivalent to the specified test fuel(s). As an alternative you may submit a chart based on a representative in-use fuel if you also provide instructions for converting the chart to be applicable to the test fuel(s).

(iii) The chart is specified in units that are adequate to make it practical for an operator to keep the vehicle properly jetted during typical use. For example, charts that specify jet sizes based on increments of temperature smaller than 20°F (11.1°C) or increments of altitude less than 2000 feet would not meet this criteria. Temperature ranges must overlap by at least 5°F (2.8°C).

(iv) You follow the jetting chart for durability testing.

(v) You do not produce your vehicles with jetting richer than the jetting chart recommendation for the intended vehicle use.

(4) We may require you to adjust the engine to any specification within the adjustable range during certification testing, production-line testing, selective enforcement auditing, or in-use testing. If we allow you to submit your recommended jetting chart instead of the range of air-fuel ratios required by paragraph (d)(1) of this section, adjust the engine to the richest specification within the jetting chart for the test conditions, unless we specify a leaner setting. We may not specify a setting leaner than that described in paragraph (d)(2)(i) of this section.

(e) Prohibited controls. You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

(f) Defeat devices. You may not equip your vehicles with a defeat device. A defeat device is an auxiliary emission-control device or other control feature that reduces the effectiveness of emission controls under conditions you may reasonably expect the vehicle to encounter during normal operation and use. This does not apply to auxiliary emission-control devices you identify in your certification application if any of the following is true:

(1) The conditions of concern were substantially included in your prescribed duty cycles.

(2) You show your design is necessary to prevent catastrophic vehicle damage or accidents.

(3) The reduced effectiveness applies only to starting the engine.

(g) Noise standards. There are no noise standards specified in this part 1051. See 40 CFR Chapter I, Subchapter G, to determine if your vehicle must meet noise emission standards under another part our regulations.

§1051.120 What warranty requirements apply to me?

(a) General requirements. You must warrant to the ultimate buyer that the new engine meets two conditions:

(1) It is designed, built, and equipped to conform at the time of sale with the requirements of this part.

(2) It is free from defects in materials and workmanship that may keep it from meeting these requirements.

(b) Warranty period. Your emission-related warranty must be valid for at least 50 percent of the vehicle's minimum useful life in kilometers or at least 30 months, whichever comes first. You may offer an emission-related warranty more generous than we require. This warranty may not be shorter than any published or negotiated warranty you offer for the engine or any of its components. If a vehicle has no odometer, base warranty periods in this paragraph

(b) only on the vehicle's age (in years).

(c) Components covered. The emission-related warranty must cover components whose failure would increase an engine's emissions, including electronic controls, fuel injection (for liquid or gaseous fuels), exhaust-gas recirculation, aftertreatment, or any other system you develop to control emissions. We generally consider replacing or repairing other components to be the owner's responsibility.

(d) Scheduled maintenance. You may schedule emission-related maintenance for a component named in paragraph (c) of this section, subject to the restrictions of §1051.125. You are not required to cover this scheduled maintenance under your warranty if the component meets either of the following criteria:

(1) The component was in general use on similar engines, and was subject to scheduled maintenance, before January 1, 2000.

(2) Failure of the component would clearly degrade the engine's performance enough that the operator would need to repair or replace it.

(e) Limited applicability. You may deny warranty claims under this section if the operator caused the problem, as described in 1068.115 of this chapter. You may ask us to allow you to exclude from your emission-related warranty certified vehicles that have been used significantly for competition, especially certified motorcycles that meet at least four of the criteria in §1051.620(b)(1).

(f) Aftermarket parts. As noted in §1068.101 of this chapter, it is a violation of the Act to manufacture a vehicle part if one of its main effects is to reduce the effectiveness of the vehicle's emission controls. If you make an aftermarket part, you may—but do not have to—certify that using the part will still allow engines to meet emission standards, as described in §85.2114 of this chapter.

§1051.125 What maintenance instructions must I give to buyers?

Give the ultimate buyer of each new vehicle written instructions for properly maintaining and using the vehicle, including the emission-control system. The maintenance instructions also apply to service accumulation on your test vehicles or engines, as described in 40 CFR part 1065, subpart E.

(a) Critical emission-related maintenance. Critical emission-related maintenance includes any adjustment, cleaning, repair, or replacement of air-induction, fuel-system, or ignition components, aftertreatment devices, pulse-air valves, exhaust gas recirculation systems, crankcase ventilation valves, sensors, or electronic control units. This may also include any other component whose only purpose is to reduce emissions or whose failure will increase emissions without significantly degrading engine performance. You may schedule critical emission-related maintenance on these components if you meet the following conditions:

(1) You may ask us to approve critical emission-related maintenance only if it meets two criteria:

- (i) Operators are reasonably likely to do the maintenance you call for.
- (ii) Vehicles need the maintenance to meet emission standards.

(2) We will accept scheduled maintenance as reasonably likely to occur in use if you satisfy any of four conditions:

- (i) You present data showing that, if a lack of maintenance increases emissions, it also unacceptably degrades the vehicle's performance.
- (ii) You present survey data showing that 80 percent of vehicles in the field get the maintenance you specify at the recommended intervals.
- (iii) You provide the maintenance free of charge and clearly say so in maintenance instructions for the customer.
- (iv) You otherwise show us that the maintenance is reasonably likely to be done at the recommended intervals.

(3) You may not schedule critical emission-related maintenance within the minimum useful life period for aftertreatment devices, pulse-air valves, fuel injectors, oxygen sensors, electronic control units, superchargers, or turbochargers.

(b) Recommended additional maintenance. You may recommend, but not require, any additional amount of maintenance on the components listed in paragraph (a) of this section. However, you must make it clear that these maintenance steps are not necessary to keep the emission-related warranty valid. If operators do the maintenance

specified in paragraph (a) of this section, but not the recommended additional maintenance, this does not allow you to disqualify them from in-use testing or deny a warranty claim.

(c) Special maintenance. You may specify more frequent maintenance to address problems related to special situations such as substandard fuel or atypical engine operation. You may not perform this special maintenance during service accumulation or durability testing.

(d) Noncritical emission-related maintenance. For engine parts not listed in paragraph (a) of this section, you may schedule any amount of emission-related inspection or maintenance. But you must state clearly that these steps are not necessary to keep the emission-related warranty valid. Also, do not take these inspection or maintenance steps during service accumulation on your test vehicles or engines.

(e) Maintenance that is not emission-related. For maintenance unrelated to emission controls, you may schedule any amount of inspection or maintenance. You may also take these inspection or maintenance steps during service accumulation on your test vehicles or engines. This might include adding engine oil or adjusting chain tension, clutch position, or tire pressure.

(f) Source of parts and repairs. Print clearly on the first page of your written maintenance instructions that any repair shop or person may maintain, replace, or repair emission-control devices and systems. Your instructions may not require no component or service identified by brand, trade, or corporate name. Also, do not directly or indirectly condition your warranty on a requirement that the vehicle be serviced by your franchised dealers or any other service establishments with which you have a commercial relationship. You may disregard the requirements in this paragraph (d) if you do one of two things:

- (1) Provide a component or service without charge under the purchase agreement.
- (2) Get us to waive this prohibition in the public's interest by convincing us the vehicle will work properly only with the identified component or service.

§1051.130 What installation instructions must I give to vehicle manufacturers?

(a) If you sell an engine for someone else to install in a recreational vehicle, give the engine buyer written instructions for installing it consistent with the requirements of this part. Include all information necessary to ensure that engines installed this way will meet emission standards.

(b) These instructions must have the following information:

- (1) Include the heading: "Emission-related installation instructions".
- (2) State: "Failing to follow these instructions when installing a certified engine in a recreational vehicle may violate federal law (40 CFR 1068.105(b)), and subject you to fines or other penalties as described in the Clean Air Act."
- (3) Describe any other instructions needed to install an exhaust aftertreatment device consistent with your application for certification.
- (4) Describe the steps needed to comply with the evaporative emission standards in §1051.110.
- (5) Describe any limits on the range of applications needed to ensure that the engine operates consistently with your application for certification. For example, if your engines are certified only to the snowmobile standards, tell vehicle manufacturers not to install the engines in other vehicles.
- (6) Describe any other instructions to make sure the installed engine will operate according to any design specifications you describe in your application for certification.
- (7) State: "If you install the engine in a way that makes the engine's emission control information label hard to read during normal engine maintenance, you must place a duplicate label on the vehicle, as described in 40 CFR

1068.105.”.

(c) You do not need installation instructions for engines you install in your own vehicles.

§1051.135 How must I label and identify the vehicles I produce?

Each of your vehicles must have three labels: a vehicle identification number as described in paragraph (a) of this section, an emission control information label as described in paragraphs (b) through (e) of this section, and a consumer information label as described in paragraph (g) of this section.

(a) Assign each production vehicle a unique identification number and permanently and legibly affix, stamp, or engrave it on the vehicle.

(b) At the time of manufacture, add a permanent label identifying the emission controls for each vehicle. This is the vehicle's "emission control information label." To meet labeling requirements, do the following things:

- (1) Attach the label in one piece so it is not removable without being destroyed or defaced.
- (2) Design and produce it to be durable and readable for the vehicle's entire life.
- (3) Secure it to a part of the vehicle (or engine) needed for normal operation and not normally requiring replacement.
- (4) Write it in block letters in English.
- (5) Attach the label in a location where it can be easily read.

(c) On your label, do these things:

- (1) Include the heading "EMISSION CONTROL INFORMATION".
- (2) Include your full corporate name and trademark.
- (3) State: "THIS VEHICLE IS CERTIFIED TO OPERATE ON [specify operating fuel or fuels]."
- (4) Identify the emission-control system; your identifiers must use names and abbreviations consistent with SAE J1930 (incorporated by reference in §1051.810).
- (5) List all requirements for fuel and lubricants.
- (6) State the date of manufacture [DAY (optional), MONTH, and YEAR]; if you stamp it on the engine and print it in the owner's manual, you may omit this information from the emission control information label.
- (7) State: "THIS VEHICLE MEETS U.S. ENVIRONMENTAL PROTECTION AGENCY REGULATIONS FOR [MODEL YEAR] [SNOWMOBILES or OFF-ROAD MOTORCYCLES or ATVs]."
- (8) Include EPA's standardized designation for the engine family.
- (9) State the engine's displacement (in liters) and maximum brake power. You do not need to include the engine's displacement and power on the emission control information label if the vehicle is permanently labeled with a unique model name that corresponds to a specific displacement/power configuration.
- (10) State the engine's useful life if it is different than the minimum value.
- (11) List specifications and adjustments for engine tuneups; show the proper position for the transmission during tuneup and state which accessories should be operating.
- (12) Identify the emission standards or family emission limits to which you have certified the engine.

(d) Some of your engines may need more information on the emission control information label. If you produce an engine or vehicle that we exempt from the requirements of this part, see subpart G of this part and 40 CFR part 1068, subparts C and D, for more label information.

(e) Some engines may not have enough space for an emission control information label with all the required information. In this case, you may omit the information required in paragraphs (c)(3), (c)(4), and (c)(5) of this section if you print it in the owner's manual instead.

(f) If you are unable to meet these labeling requirements, you may ask us to modify them consistent with the intent of this section.

(g) Label every vehicle certified under this part with a removable hang-tag showing its emission characteristics relative to other models. The label should be attached securely to the vehicle before it is offered for sale in such a manner that it would not be accidentally removed prior to sale. Use the applicable equations of this paragraph (g) to determine the normalized emission rate (NER) from the FEL for your vehicle. If the vehicle is certified without using the averaging provisions of subpart H, use the final deteriorated emission level. Round the resulting normalized emission rate for your vehicle to the nearest whole number. We may specify a standardized format for labels. At a minimum, the tag should include: the manufacturer's name, vehicle model name, engine description (500 cc two-stroke with DFI), the NER, and a brief explanation of the scale (for example, note that 0 is the cleanest and 10 is the least clean).

(1) For snowmobiles, use the following equation:

$$\text{NER} = 16.61 \times \log(2.667 \times \text{HC} + \text{CO}) - 38.22$$

Where HC and CO are the cycle-weighted FELs (or emission rates) for hydrocarbons and carbon monoxide in g/kW-hr.

(2)(i) For off-highway motorcycles with HC+NO_x emissions less than or equal to 2.0 g/km, use the following equation:

$$\text{NER} = 2.500(\text{HC} + \text{NO}_x)$$

Where HC +NO_x is the FEL (or the sum of the cycle-weighted emission rates) for hydrocarbons and oxides of nitrogen in g/km.

(ii) For off-highway motorcycles with HC+NO_x emissions greater than 2.0 g/km, use the following equation:

$$\text{NER} = 5.000 \times \log(\text{HC} + \text{NO}_x) + 3.495$$

Where HC +NO_x is the FEL (or the sum of the cycle-weighted emission rates) for hydrocarbons and oxides of nitrogen in g/km.

(3)(i) For ATVs with HC+NO_x emissions less than or equal to 1.5 g/km, use the following equation:

$$\text{NER} = 3.333(\text{HC} + \text{NO}_x)$$

Where HC +NO_x is the FEL (or the sum of the cycle-weighted emission rates) for hydrocarbons and oxides of nitrogen in g/km.

(ii) For ATVs with HC+NO_x emissions greater than 1.5 g/km, use the following equation:

$$\text{NER} = 4.444 \times \log(\text{HC} + \text{NO}_x) + 4.217$$

Where HC +NO_x is the FEL (or the sum of the cycle-weighted emission rates) for hydrocarbons and oxides of nitrogen in g/km.

§1051.145 What provisions apply only for a limited time?

Apply the following provisions instead of others in this part for the periods and circumstances specified in this section.

(a) Provisions for small-volume manufacturers. Special provisions apply to you if you are a small-volume manufacturer subject to the requirements of this part. Contact us before 2006 if you intend to use these provisions.

- (1) You may delay complying with otherwise applicable emission standards (and other requirements) for two model years.
- (2) If you are a small-volume manufacturer of snowmobiles, only 50 percent of the models you produce (instead of all of the models you produce) must meet emission standards in the first two years they apply to you as a small-volume manufacturer, as described in paragraph (a)(1) of this section. For example, this alternate phase-in allowance would allow small-volume snowmobile manufacturers to comply with the Phase 1 exhaust standards by certifying 50 percent of their snowmobiles in 2008, 50 percent of their snowmobiles in 2009, and 100 percent in 2010.
- (3) Your vehicles for model years before 2011 may be exempt from the exhaust standards of this part if you meet the following criteria:
 - (i) Produce your vehicles by installing engines covered by a valid certificate of conformity under 40 CFR part 90 that shows the engines meet standards for Class II engines for each engine's model year.
 - (ii) Do not change the engine in a way that we could reasonably expect to increase its exhaust emissions.
 - (iii) The engine meets all applicable requirements from 40 CFR part 90. This applies to engine manufacturers, vehicle manufacturers who use these engines, and all other persons as if these engines were not used in recreational vehicles.
 - (iv) Demonstrate that fewer than 50 percent of the engine model's total sales, from all companies, are used in recreational vehicles regulated under this part.

(4) All vehicles certified or exempted under this paragraph (a) must be labeled according to our specifications.

The label must include the following:

- (i) The heading "EMISSION CONTROL INFORMATION".
- (ii) Your full corporate name and trademark.
- (iii) A description of the provisions under which the vehicle is either exempted or certified.
- (iv) Other information that we specify to you in writing.

(b) Optional emission standards for ATVs. To meet ATV standards for model years before 2009, you may apply the exhaust emission standards by model year in paragraph (b)(1) of this section while measuring emissions using the engine-based test procedures in 40 CFR part 1065 instead of the chassis-based test procedures in 40 CFR part 86.

- (1) Follow Table 1 of this section for exhaust emission standards, while meeting all the other requirements of §1051.107. You may use emission credits to show compliance with these standards (see subpart H of this part). You may not exchange emission credits with engine families meeting the standards in §1051.107(a). You may also not exchange credits between engine families certified to the standards for engines above 225 cc and engine families certified to the standards for engines below 225 cc. The phase-in percentages in the table specify the percentage of your U.S.-directed production that must comply with the emission standards for those model

years. Table 1 follows:

Table 1 of §1051.145—
Optional Exhaust Emission Standards for ATVs (g/kW-hr)

Engine Displacement	Model Year	Phase-in	Emission standards		Maximum allowable Family Emission Limits
			HC+NOx	CO	HC+NOx
<225 cc	2006	50%	16.1	400	32.2
	2007 and 2008	100%	16.1	400	32.2
≥225 cc	2006	50%	13.4	400	26.8
	2007 and 2008	100%	13.4	400	26.8

(2) Measure emissions by testing the engine on a dynamometer with the steady-state duty cycle described in Table 2 of this section.

- (i) During idle mode, hold the speed within your specifications, keep the throttle fully closed, and keep engine torque under 5 percent of the peak torque value at maximum test speed.
- (ii) For the full-load operating mode, operate the engine at its maximum fueling rate.
- (iii) See part 1065 of this chapter for detailed specifications of tolerances and calculations.
- (iv) Table 2 follows:

Table 2 of §1051.145—
6-Mode Duty Cycle for Recreational Engines

Mode Number	Engine Speed (percent of maximum test speed)	Torque (percent of maximum test torque at test speed)	Minimum Time in mode (minutes)	Weighting Factors
1	85	100	5.0	0.09
2	85	75	5.0	0.20
3	85	50	5.0	0.29
4	85	25	5.0	0.30
5	85	10	5.0	0.07
6	Idle	0	5.0	0.05

(3) For ATVs certified to the standards in this paragraph (b) use the following equation to determine the normalized emission rate required by §1051.140(g):

$$\text{NER} = 9.898 \times \log(\text{HC} + \text{NO}_x) - 4.898$$

where HC +NOx is the sum of the cycle-weighted emission rates for hydrocarbons and oxides of nitrogen in

g/kW-hr.

(c) Production-line testing. Vehicles certified to the Phase 1 or Phase 2 standards in §1051.103, or the Phase 1 standards in §§1051.105 or 1051.107 are exempt from the production-line testing requirements of subpart D of this part if they are certified without participating in the emission averaging, banking and trading program described in Subpart H of this part .

(d) Phase-in flexibility. For model years before 2014, if you make a good faith effort to comply, but fail to meet the sales requirements of this part during a phase-in period for new standards, or fail to meet the average emission standards, we may approve an alternative remedy to offset the emission reduction deficit using future emission credits under this part. To apply for this, you must:

- (1) Submit a plan during the certification process for the first model year of the phase-in showing how you project to meet the sales requirement of the phase-in.
- (2) Notify us less than 30 days after you determine that you are likely to fail to comply with the sales requirement of the phase-in.
- (3) Propose a remedy that will achieve equivalent or greater emission reductions compared to the specified phase-in requirements, and that will offset the deficit within one model year.

(e) Snowmobile testing. You may use the raw sampling procedures described in 40 CFR part 91 (subparts D and E) for emission testing of snowmobiles for model years prior to 2010. For later model years, you may use these procedures if you show that they produce emission measurements equivalent to the otherwise specified test procedures.

(f) Early credits. Snowmobile manufacturers may generate early emission credits in one of the following ways, by certifying some or all of their snowmobiles prior to 2006. Credit generating snowmobiles must meet all other applicable requirements of this part. No early credits may be generated by off-highway motorcycles or ATVs.

- (1) You may certify one or more snowmobile engine families to FELs (HC and CO) below the numerical level of the Phase 2 standards prior to the date when compliance with the Phase 1 standard is otherwise required. Credits are calculated relative to the Phase 2 standards. Credits generated under this paragraph (1) may be used at any time before 2012.
- (2) You may certify a snowmobile engine family to FELs (HC and CO) below the numerical level of the Phase 1 standards prior to the date when compliance with the Phase 1 standard is otherwise required. Credits are calculated relative to the Phase 1 standards. Credits generated under this paragraph (3) may only be used for compliance with the Phase 1 standards. You may generate credits under this paragraph (3) without regard to whether the FELs are above or below the numerical level of the Phase 2 standards.

(g) Pull-ahead option for permeation emissions. Manufacturers choosing to comply with an early tank permeation standard of 3.0 g/m²/day prior to model year 2008 may be allowed to delay compliance with the 1.5 g/m²/day standard, for an equivalent number of tanks, subject to the following provisions:

- (1) Pull-ahead tanks meeting the 3.0 g/m²/day standard must be certified and must meet all applicable requirements other than those limited to compliance with the exhaust standards.
- (2) Tanks for which compliance with the 1.5 g/m²/day standard is delayed must meet the 3.0 g/m²/day standard.
- (3) You may delay compliance with the 3.0 g/m²/day standard for one tank for one year for each tank-year of credit generated early.
- (4) You may not use credits for a tank that is larger than the tank from which you generated the credits.

Subpart C—Certifying Engine Families

§1051.201 What are the general requirements for submitting a certification application?

- (a) Send us an application for a certificate of conformity for each engine family. Each application is valid for only one model year.
- (b) The application must not include false or incomplete statements or information (see §1051.255).
- (c) We may choose to ask you to send us less information than we specify in this subpart, but this would not change your recordkeeping requirements.
- (d) Use good engineering judgment for all decisions related to your application (see §1068.5 of this chapter).
- (e) An authorized representative of your company must approve and sign the application.

§1051.205 What must I include in my application?

In your application, do all the following things unless we ask you to send us less information:

- (a) Describe the engine family's specifications and other basic parameters of the vehicle design. List the types of fuel you intend to use to certify the engine family (for example, gasoline, liquefied petroleum gas, methanol, or natural gas). List vehicle configurations and model names that are included in the engine family.
- (b) Explain how the emission-control systems operate.
 - (1) Describe in detail all the system components for controlling exhaust emissions, including auxiliary emission-control devices and all fuel-system components you will install on any production or test vehicle or engine. Explain why any auxiliary emission-control devices are not defeat devices (see §1051.115(f)). Do not include detailed calibrations for components unless we ask for them.
 - (2) Describe the evaporative emission controls.
- (c) Describe the vehicles or engines you selected for testing and the reasons for selecting them.
- (d) Describe any special or alternate test procedures you used (see §1051.501).
- (e) Describe how you operated the engine or vehicle prior to testing, including the duty cycle and the number of engine operating hours used to stabilize emission levels, and any scheduled maintenance you performed.
- (f) List the specifications of the test fuels to show that they fall within the required ranges.
- (g) Identify the engine family's useful life.
- (h) Propose maintenance and use instructions for the ultimate buyer of each new vehicle (see §1051.125).
- (i) Propose emission-related installation instructions if you sell engines for someone else to install in a vehicle (see §1051.130).
- (j) Propose an emission control information label.
- (k) Present emission data to show that you meet emission standards.
 - (1) Present exhaust emission data for HC, NO_x (as applicable), and CO on a test vehicle or engine to show your vehicles meet the emission standards we specify in subpart B of this part. Show these figures before and after applying deterioration factors for each vehicle or engine. Include test data for each type of fuel from part 1065, subpart C of this chapter on which you intend for vehicles in the engine family to operate (for example, gasoline, liquefied petroleum gas, methanol, or natural gas). If we specify more than one grade of any fuel type (for example, a summer grade and winter grade of gasoline), you only need to submit test data for one grade, unless the regulations of this part explicitly specify otherwise for your vehicle.
 - (2) Present evaporative test data for HC to show your vehicles meet the evaporative emission standards we

specify in subpart B of this part. Show these figures before and after applying deterioration factors for each vehicle or engine, where applicable. If you did not perform the testing, identify the source of the test data.

(3) Note that §1051.235 and 1051.245 allows you to submit an application in certain cases without new emission data.

- (l) Report all test results, including those from invalid tests or from any nonstandard tests (such as measurements based on exhaust concentrations in parts per million).
- (m) Identify the engine family's deterioration factors and describe how you developed them. Present any emission test data you used for this.
- (n) Describe all adjustable operating parameters and other adjustments (see §1051.115 (c) and (d)), including the following:
 - (1) The nominal or recommended setting.
 - (2) The intended physically adjustable range, including production tolerances if they affect the range.
 - (3) The limits or stops used to establish adjustable ranges.
 - (4) The air-fuel ratios or jet chart specified in §1051.115(d).
- (o) State that you operated your test vehicles or engines according to the specified procedures and test parameters using the fuels described in the application to show you meet the requirements of this part.
- (p) State unconditionally that all the vehicles (and/or engines) in the engine family comply with the requirements of this part, other referenced parts, and the Clean Air Act.
- (q) Include estimates of U.S.-directed production volumes.
- (r) Show us how to modify your production vehicles to measure emissions in the field (see §1051.115).
- (s) Add other information to help us evaluate your application if we ask for it.

§1051.210 May I get preliminary approval before I complete my application?

If you send us information before you finish the application, we will review it and make any appropriate determinations listed in §1051.215(b)(1) through (5). Decisions made under this section are considered to be preliminary approval. We will generally not disapprove applications under §1051.215(b)(1) through (5) where we have given you preliminary approval, unless we find new and substantial information supporting a different decision.

- (a) If you request preliminary approval related to the upcoming model year or the model year after that, we will make a "best-efforts" attempt to make the appropriate determinations as soon as possible. We will generally not provide preliminary approval related to a future model year more than two years ahead of time.
- (b) If we have published general guidance that serves as our determination for your situation, you may consider that to be preliminary approval.

§1051.215 What happens after I complete my application?

- (a) If any of the information in your application changes after you submit it, amend it as described in §1051.225.
- (b) We may deny your application (that is, determine that we cannot approve it without revision) if the engine family does not meet the requirements of this part or the Act. For example:
 - (1) If you inappropriately use the provisions of §1051.230(c) or (d) to define a broader or narrower engine family, we will require you to redefine your engine family.
 - (2) If we determine you did not appropriately select the useful life as specified in §1051.103(c), §1051.105(c), or §1051.107(c), we will require you to lengthen it.
 - (3) If we determine you did not appropriately select deterioration factors under §1051.240(c), we will require

you to revise them.

(4) If your proposed emission control information label is inconsistent with §1051.135, we will require you to change it (and tell you how, if possible).

(5) If you require or recommend maintenance and use instructions inconsistent with §1051.125, we will require you to change them.

(6) If we find any other problem with your application, we will tell you what the problem is, and what needs to be corrected.

(c) If we determine your application is complete and shows that the engine family meets all the requirements of this part and the Act, we will issue a certificate of conformity for your engine family for that model year. If we deny the application, we will explain why in writing. You may then ask us to hold a hearing to reconsider our decision (see §1051.820).

§1051.220 How do I amend the maintenance instructions in my application?

Send the Designated Officer a request to amend your application for certification for an engine family if you want to change the emission-related maintenance instructions in a way that could affect emissions. In your request, describe the proposed changes to the maintenance instructions.

(a) If you are decreasing the specified level of maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. We may approve a shorter time or waive this requirement.

(b) If your requested change would not decrease the specified level of maintenance, you may distribute the new maintenance instructions anytime after you send your request.

(c) If you are correcting or clarifying your maintenance instructions or if you are changing instructions for maintenance unrelated to emission controls, the requirements of this section do not apply.

§1051.225 How do I amend my application to include new or modified vehicles or to change an FEL?

(a) You must amend your application for certification before you take either of the following actions:

(1) Add a vehicle to a certificate of conformity.

(2) Make a design change for a certified engine family that may affect emissions or an emission-related part over the vehicle's lifetime.

(3) Modify an FEL for an engine family, as described in paragraph (f) of this section.

(b) Send the Designated Officer a request to amend the application for certification for an engine family. In your request, do all of the following:

(1) Describe the vehicle model or configuration you are adding or changing.

(2) Include engineering evaluations or reasons why the original test vehicle or engine is or is not still appropriate.

(3) If the original test vehicle or engine for the engine family is not appropriate to show compliance for the new or modified vehicle, include new test data showing that the new or modified vehicle meets the requirements of this part.

(c) You may start producing the new or modified vehicle anytime after the time at which you send us your request (for example, the day you mail your request). If we determine that the affected vehicles do not meet applicable requirements, we will require you to cease production of the vehicles and to recall and correct the vehicles at no expense to the owner. If you choose to produce vehicles under this paragraph, we will consider that to be consent to

recall all vehicles that we determine do not meet applicable standards and other requirements and to remedy the nonconformity at no expense to the owner.

(d) You must give us test data within 30 days if we ask for more testing, or stop producing the vehicle if you are not able to do this. You may give us an engineering evaluation instead of test data if we agree that you can address our questions without test data.

(e) If we determine that the certificate of conformity would not cover your new or modified vehicle, we will send you a written explanation of our decision. In this case, you may no longer produce these vehicles, though you may ask for a hearing for us to reconsider our decision (see §1051.820).

(f) You may ask to change your FEL in the following cases:

(1) You may ask to raise your FEL for your engine family after the start of production. You must use the higher FEL for the entire family to calculate your average emission level under subpart H of this part. In your request, you must demonstrate that you will still be able to comply with the applicable average emission standards as specified in subparts B and H of this part.

(2) You may ask to lower the FEL for your engine family after the start of production only when you have test data from production vehicles indicating that your vehicles comply with the lower FEL. You may create a separate subfamily with the lower FEL. Otherwise, you must use the higher FEL for the family to calculate your average emission level under subpart H of this part.

(3) If you change the FEL during production, you must include the new FEL on the emission control information label for all vehicles produced after the change.

§1051.230 How do I select engine families?

(a) Divide your product line into families of vehicles that you expect to have similar emission characteristics. Your engine family is limited to a single model year.

(b) Group vehicles in the same engine family if they are the same in all of the following aspects:

(1) The combustion cycle.

(2) The cooling system (water-cooled vs. air-cooled).

(3) Configuration of the fuel system (for example, port fuel injection vs. carburetion).

(4) Method of air aspiration.

(4) The number, location, volume, and composition of catalytic converters.

(5) Type of fuel.

(6) The number, arrangement, and approximate bore diameter of cylinders.

(7) Evaporative emission controls.

(c) In some cases you may subdivide a group of vehicles that is identical under paragraph (b) of this section into different engine families. To do this under normal circumstances, you must show you expect emission characteristics to be different during the useful life or that any of the following engine characteristics are different:

(1) Method of actuating intake and exhaust timing (poppet valve, reed valve, rotary valve, etc.).

(2) Location or size of intake and exhaust valves or ports.

(3) Configuration of the combustion chamber.

(4) Cylinder stroke or actual bore diameter.

(5) Exhaust system.

(d) In some cases, you may include different engines in the same engine family, even though they are not identical with respect to the things listed in paragraph (b) of this section.

- (1) If different engines have similar emission characteristics during the useful life, we may approve grouping them in the same engine family.
 - (2) If you are a small-volume manufacturer, you may group engines from any vehicles subject to the same emission standards into a single engine family. This does not change any of the requirements of this part for showing that an engine family meets emission standards.
- (e) If you cannot appropriately define engine families by the method in this section, we will define them based on features related to emission characteristics.
- (f) You may ask us to create separate families for exhaust emissions and evaporative emissions. If we do this, list both families on the emission control information label.

§1051.235 What emission testing must I perform for my application for a certificate of conformity?

This section describes the emission testing you must perform to show compliance with the emission standards in subpart B of this part during certification.

- (a) Test your emission-data vehicles using the procedures and equipment specified in subpart F of this part. Where specifically required or allowed, test the engine instead of the vehicle. For evaporative emissions, test the fuel system components separate from the vehicle.
- (b) Select from each engine family a test vehicle or engine, and a fuel system for each fuel type with a configuration that is most likely to exceed the emission standards, using good engineering judgment, consider the emission levels of all exhaust constituents over the full useful life of the vehicle.
- (c) You may use previously generated emission data in the following cases:
 - (1) You may submit emission data for equivalent engine families from previous years instead of doing new tests, but only if the data show that the test vehicle or engine would meet all the requirements for the latest vehicle or engine models. We may require you to do new emission testing if we believe the latest vehicle or engine models could be substantially different from the previously tested vehicle or engine.
 - (2) You may submit emission data for equivalent engine families performed to show compliance with other standards (such as California standards) instead of doing new tests, but only if the data show that the test vehicle or engine would meet all of this part's requirements.
 - (3) You may submit evaporative emission data measured by a fuel system supplier. We may require you to verify that the testing was conducted in accordance with the applicable regulations.
- (d) We may choose to measure emissions from any of your test vehicles or engines (or other vehicles or engines in the engine family).
 - (1) If we do this, you must provide the test vehicle or engine at the location we select. We may decide to do the testing at your plant or any other facility. If we choose to do the testing at your plant, you must schedule it as soon as possible and make available the instruments and equipment we need.
 - (2) If we measure emissions on one of your test vehicles or engines, the results of that testing become the official data for the vehicle or engine. Unless we later invalidate this data, we may decide not to consider your data in determining if your engine family meets the emission standards.
 - (3) Before we test one of your vehicles or engines, we may set its adjustable parameters to any point within the physically adjustable ranges (see §1051.115(c)). We may also adjust the air-fuel ratio within the adjustable range specified in §1051.115(d).
 - (4) Calibrate the test vehicle or engine within normal production tolerances for anything not covered by §1051.115(c) and (d) of this section.

(e) If you are a small-volume manufacturer, you may certify by design on the basis of preexisting exhaust emission data for similar technologies and other relevant information, and in accordance with good engineering judgment. In those cases, you are not required to test your vehicles. This is called "design-certification" or "certifying by design." To certify by design, you must show that the technology used on your engines is sufficiently similar to the previously tested technology that a person reasonably familiar with emission-control technology would believe that your engines will comply with the emission standards.

(f) For fuel tanks that are certified based on permeability treatments for plastic fuel tanks, you do not need to test each engine family. However, you must use good engineering judgment to determine permeation rates for the tanks. This requires that more than one fuel tank be tested for each set of treatment conditions. You may not use test data from a given tank for any other tanks that have thinner walls. You may, however, use test data from a given tank for other tanks that have thicker walls. This applies to both low-hour (i.e., baseline testing) and durability testing. Note that §1051.245 allows you to use design-based certification instead of generating new emission data.

§1051.240 How do I demonstrate that my engine family complies with exhaust emission standards?

(a) For certification, your engine family is considered to be in compliance with the numerical exhaust emission standards in subpart B of this part if all emission-data vehicles representing that family have test results showing emission levels at or below the standards.

(b) Your engine family does not comply if any emission-data vehicle representing that family has test results showing emission levels above the standards for any pollutant.

(c) To compare emission levels from the emission-data vehicle with the emission standards, apply deterioration factors (to three significant figures) to the measured emission levels. The deterioration factor is a number that shows the relationship between exhaust emissions at the end of useful life and at the low-hour test point. Section 1051.520 specifies how to test your vehicle to develop deterioration factors that estimate the change in emissions over your vehicle's full useful life. Small-volume manufacturers may use assigned deterioration factors that we establish. Apply the deterioration factors as follows:

(1) For vehicles that use aftertreatment technology, such as catalytic converters, the exhaust deterioration factor is the ratio of exhaust emissions at the end of useful life to exhaust emissions at the low-hour test point. Adjust the official emission results for each tested vehicle at the selected test point by multiplying the measured emissions by the deterioration factor. If the factor is less than one, use one.

(2) For vehicles that do not use aftertreatment technology, the exhaust deterioration factor is the difference between exhaust emissions at the end of useful life and exhaust emissions at the low-hour test point. Adjust the official emission results for each tested vehicle at the selected test point by adding the factor to the measured emissions. If the factor is less than zero, use zero.

(d) After adjusting the emission levels for deterioration, round them to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each test vehicle.

§1051.245 How do I demonstrate that my engine family complies with evaporative emission standards?

(a) For certification, your engine family is considered in compliance with the evaporative emission standards in subpart B of this part if you do either of the following:

(1) You have test results showing permeation emission levels from the fuel tanks and fuel lines in the family are at or below the standards in §1051.110 throughout the useful life.

(2) You comply with the design specifications in paragraph (e) of this section.

(b) Your engine family does not comply if any fuel tank or fuel line representing that family has test results showing emission levels above the standards.

(c) To compare emission levels with the emission standards, apply deterioration factors (to three significant figures) to the measured emission levels. The deterioration factor is a number that shows the relationship between emissions at the end of useful life and at the low-hour test point. For permeation emissions, the deterioration factor is the difference between evaporative emissions at the end of useful life and evaporative emissions at the low-hour test point. Adjust the official emission results for each tested vehicle at the selected test point by adding the factor to the measured emissions. If the factor is less than zero, use zero.

(1) Section 1051.515 specifies how to test your fuel tanks to develop deterioration factors that estimate the change in emissions over your vehicle’s full useful life. Small-volume manufacturers may use assigned deterioration factors that we establish. Apply the deterioration factors as follows:

(i) Calculate the deterioration factor from emission tests performed before and after the durability tests described in §1051.515(c) and using good engineering judgment. The durability tests described in §1051.515(c) represent the minimum requirements for determining a deterioration factor. You may not use a deterioration factor that is less than the difference between evaporative emissions before and after the durability tests described in §1051.515(c).

(ii) Do not apply the deterioration factor to test results for tanks that have already undergone these durability tests.

(2) Determine the deterioration factor for fuel lines using good engineering judgment.

(d) After adjusting the emission levels for deterioration, round them to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each test vehicle.

(e) You may demonstrate for certification that your engine family complies with the evaporative emission standards by demonstrating that you use the following control technologies:

(1) For certification to the standards specified in §1051.110(a) with the following control technologies shown in the Tables 1, which follows:

Table 1 of §1051.245—
Design-certification Technologies for Controlling Tank Permeation

If the tank permeability control technology is...	Then you may design-certify with a tank emission level of . . .
A metal fuel tank with no non-metal gaskets or with gaskets made from a low-permeability material. ¹	1.5 g/m ² /day
A metal fuel tank with non-metal gaskets with an exposed surface area of 1000 mm ² or less.	1.5 g/m ² /day

¹Permeability of 10 g/m²/day or less according to ASTM D 814-95 (incorporated by reference in §1051.810).

(2) For certification to the standards specified in §1051.110(b) with the following control technologies shown in the Tables 1, which follows:

Table 2 of §1051.245—
Design-certification Technologies for Controlling Fuel-line Permeation

If the fuel-line permeability control technology is...	Then you may design-certify with a fuel line permeation emission level of . . .
Hose meeting Category 1 permeation specifications in SAE J2260 (incorporated by reference in §1051.810).	15 g/m ² /day
Hose meeting the R11-A or R12 permeation specifications in SAE J30 (incorporated by reference in §1051.810).	15 g/m ² /day

(3) We may establish additional design certification options where we find that new test data demonstrate that the use of other technology designs will ensure compliance with the applicable emission standards.

§1051.250 What records must I keep and make available to EPA?

(a) Organize and maintain the following records to keep them readily available; we may review these records at any time:

- (1) A copy of all applications and any summary information you sent us.
- (2) Any of the information we specify in §1051.205 that you did not include in your application.
- (3) A detailed history of each emission-data vehicle. In each history, describe all of the following:
 - (i) The emission-data vehicle's construction, including its origin and buildup, steps you took to ensure that it represents production vehicles, any components you built specially for it, and all emission-related components.
 - (ii) How you accumulated vehicle or engine operating hours, including the dates and the number of hours accumulated.
 - (iii) All maintenance (including modifications, parts changes, and other service) and the dates and reasons for the maintenance.
 - (iv) All your emission tests, including documentation on routine and standard tests, as specified in part 1065 of this chapter or other applicable test procedures regulations, and the date and purpose of each test.
 - (v) All tests to diagnose engine or emission-control performance, giving the date and time of each and the reasons for the test.
 - (vi) Any other significant events.

(b) Keep routine data from emission tests (such as test cell temperatures and relative humidity readings) for one year after we issue the associated certificate of conformity. Keep all other information specified in paragraph (a) of this section for eight years after we issue your certificate.

(c) Store these records in any format and on any media, as long as you can promptly send us organized, written records in English if we ask for them.

(d) Send us copies of any maintenance instructions or explanations if we ask for them.

§1051.255 When may EPA deny, revoke, or void my certificate of conformity?

(a) We may deny your application for certification if your engine family fails to comply with emission standards or other requirements of the regulation or the Act. Our decision may be based on any information available to us

showing you do not meet emission standards or other requirements, including any testing that we conduct under paragraph (g) of this section. If we deny your application, we will explain why in writing.

(b) In addition, we may deny your application or revoke your certificate if you do any of the following:

(1) Refuse to comply with any testing or reporting requirements.

(2) Submit false or incomplete information (paragraph (d) of this section applies if this is fraudulent).

(3) Render inaccurate any test data.

(4) Deny us from completing authorized activities despite our presenting a warrant or court order (see §1068.20 of this chapter).

(5) Produce vehicle or engines for importation into the United States at a location where local law prohibits us from carrying out authorized activities.

(c) We may void your certificate if you do not keep the records we require or do not give us information when we ask for it.

(d) We may void your certificate if we find that you intentionally submitted false or incomplete information.

(e) We may void your certificate for any family certified to an FEL above the allowable average if you fail to show in your end-of-year report that your average emission levels are below the applicable standards in subpart B of this part, or that you have sufficient credits to offset a credit deficit for the model year.

(f) If we deny your application or revoke or void your certificate, you may ask for a hearing (see §1051.820). Any such hearing will be limited to substantial and factual issues.

(g) We may conduct confirmatory testing of your vehicles as part of certification. We may deny your application for certification or revoke your certificate if your vehicles fail to comply with emission standards or other requirements during confirmatory testing.

Subpart D—Testing Production-line Engines

§1051.301 When must I test my production-line vehicles or engines?

- (a) If you certify vehicles to the standards of this part, you must test them as described in this subpart. If your vehicle is certified to g/kW-hr standards, then test the engine; otherwise, test the vehicle. The provisions of this subpart do not apply to small-volume manufacturers.
- (b) We may suspend or revoke your certificate of conformity for certain engine families if your production-line vehicles or engines do not meet the requirements of this part or you do not fulfill your obligations under this subpart (see §§1051.325 and 1051.340).
- (c) Other requirements apply to vehicles and engines that you produce. Other regulatory provisions authorize us to suspend, revoke, or void your certificate of conformity, or order recalls for engine families without regard to whether they have passed these production-line testing requirements. The requirements of this subpart do not affect our ability to do selective enforcement audits, as described in part 1068 of this chapter. Individual vehicles and engines in families that pass these production-line testing requirements must also conform to all applicable regulations of this part and part 1068 of this chapter.
- (d) You may ask to use an alternate program for testing production-line vehicles or engines. In your request, you must show us that the alternate program gives equal assurance that your products meet the requirements of this part. If we approve your alternate program, we may waive some or all of this subpart's requirements.
- (e) If you certify an engine family with carryover emission data, as described in §1051.235(c), and these equivalent engine families consistently pass the production-line testing requirements over the preceding two-year period, you may ask for a reduced testing rate for further production-line testing for that family. The minimum testing rate is one vehicle or engine per engine family. If we reduce your testing rate, we may limit our approval to a any number of model years. In determining whether to approve your request, we may consider the number of vehicles or engines that have failed the emission tests.
- (f) We may ask you to make a reasonable number of production-line vehicles or engines available for a reasonable time so we can test or inspect them for compliance with the requirements of this part.
- (g) The requirements of this subpart do not apply to engine families certified under the provisions of §1051.630.

§1051.305 How must I prepare and test my production-line vehicles or engines?

- (a) Test procedures. Test your production-line vehicles or engines using the applicable testing procedures in subpart F of this part to show you meet the emission standards in subpart B of this part.
- (b) Modifying a test vehicle or engine. Once a vehicle or engine is selected for testing (see §1051.310), you may adjust, repair, prepare, or modify it or check its emissions only if one of the following is true:
 - (1) You document the need for doing so in your procedures for assembling and inspecting all your production vehicles or engines and make the action routine for all the vehicles or engines in the engine family.
 - (2) This subpart otherwise specifically allows your action.
 - (3) We approve your action in advance.
- (c) Malfunction. If a vehicle or engine malfunction prevents further emission testing, ask us to approve your decision to either repair it or delete it from the test sequence.
- (d) Setting adjustable parameters. Before any test, we may adjust or require you to adjust any adjustable parameter

to any setting within its physically adjustable range.

(1) We may adjust idle speed outside the physically adjustable range as needed only until the vehicle or engine has stabilized emission levels (see paragraph (e) of this section). We may ask you for information needed to establish an alternate minimum idle speed.

(2) We may make or specify adjustments within the physically adjustable range by considering their effect on emission levels, as well as how likely it is someone will make such an adjustment with in-use vehicles.

(3) We may adjust the air-fuel ratio within the adjustable range specified in §1051.115(d).

(e) Stabilizing emission levels. Before you test production-line vehicles or engines, you may operate the vehicle or engine to stabilize the emission levels. Using good engineering judgment, operate your vehicles or engines in a way that represents the way they will be used. You may operate each vehicle or engine for no more than the greater of two periods:

(1) 50 hours.

(2) The number of hours you operated the emission-data vehicle used for certifying the engine family (see 40 CFR part 1065, subpart E, or the applicable regulations governing how you should prepare your test vehicle or engine).

(f) Damage during shipment. If shipping a vehicle or engine to a remote facility for production-line testing makes necessary an adjustment or repair, you must wait until after the after the initial emission test to do this work. We may waive this requirement if the test would be impossible or unsafe, or if it would permanently damage the vehicle or engine. Report to us, in your written report under §1051.345, all adjustments or repairs you make on test vehicles or engines before each test.

(g) Retesting after invalid tests. You may retest a vehicle or engine if you determine an emission test is invalid. Explain in your written report reasons for invalidating any test and the emission results from all tests. If you retest a vehicle or engine, you may ask us to substitute results of the new tests for the original ones. You must ask us within ten days of testing. We will generally answer within ten days after we receive your information.

§1051.310 How must I select vehicles or engines for production-line testing?

(a) Use test results from two vehicles or engines for each engine family to calculate the required sample size for the test period. Update this calculation with each test.

(1) For engine families with projected annual sales of at least 1600, the test periods are consecutive quarters (3 months). If your annual production period is less than 12 months long, define your test periods by dividing your annual production period into approximately equal segments of 70 to 125 calendar days.

(2) For engine families with projected annual sales below 1600, the test period is the whole model year.

(b) Early in each test period, randomly select and test an engine from the end of the assembly line for each engine family.

(1) In the first test period for newly certified engines, randomly select and test one more engine. Then, calculate the required sample size for the test period as described in paragraph (c) of this section.

(2) In later test periods or for engine families relying on previously submitted test data, combine the new test result with the last test result from the previous test period. Then, calculate the required sample size for the new test period as described in paragraph (c) of this section.

(c) Calculate the required sample size for each engine family. Separately calculate this figure for HC, NO_x (or HC+NO_x), and CO (and other regulated pollutants). The required sample size is the greater of these calculated values. Use the following equation:

$$N = \left[\frac{(t_{95} \times \sigma)}{(x - STD)} \right]^2 + 1$$

Where:

- N = Required sample size for the model year.
- t_{95} = 95% confidence coefficient, which depends on the number of tests completed, n, as specified in the table in paragraph (c)(1) of this section. It defines 95% confidence intervals for a one-tail distribution.
- x = Mean of emission test results of the sample.
- STD = Emission standard (or family emission limit, if applicable).
- σ = Test sample standard deviation (see paragraph (c)(2) of this section).

(1) Determine the 95% confidence coefficient, t_{95} , from the following table:

n	t_{95}	n	t_{95}	n	t_{95}
2	6.31	12	1.80	22	1.72
3	2.92	13	1.78	23	1.72
4	2.35	14	1.77	24	1.71
5	2.13	15	1.76	25	1.71
6	2.02	16	1.75	26	1.71
7	1.94	17	1.75	27	1.71
8	1.90	18	1.74	28	1.70
9	1.86	19	1.73	29	1.70
10	1.83	20	1.73	30+	1.70
11	1.81	21	1.72		

(2) Calculate the standard deviation, σ , for the test sample using the following formula:

$$\sigma = \sqrt{\frac{\sum(X_i - x)^2}{n - 1}}$$

Where:

- X_i = Emission test result for an individual vehicle or engine.
- n = The number of tests completed in an engine family.

(d) Use final deteriorated test results to calculate the variables in the equations in paragraph (c) of this section (see §1051.315(a)).

- (e) After each new test, recalculate the required sample size using the updated mean values, standard deviations, and the appropriate 95-percent confidence coefficient.
- (f) Distribute the remaining vehicle or engine tests evenly throughout the rest of the year. You may need to adjust your schedule for selecting vehicles or engines if the required sample size changes. Continue to randomly select vehicles or engines from each engine family; this may involve testing vehicles or engines that operate on different fuels.
- (g) Continue testing any engine family for which the sample mean, \bar{x} , is greater than the emission standard. This applies if the sample mean for either HC, NO_x (or HC+NO_x), or CO (or other regulated pollutants) is greater than the emission standard. Continue testing until one of the following things happens:
- (1) The sample size, n , for an engine family is greater than the required sample size, N , and the sample mean, \bar{x} , is less than or equal to the emission standard. For example, if $N = 3.1$ after the third test, the sample-size calculation does not allow you to stop testing.
 - (2) The engine family does not comply according to §1051.325.
 - (3) You test 30 vehicles or engines from the engine family.
 - (4) You test one percent of your projected annual U.S.-directed production volume for the engine family.
 - (5) You choose to declare that the engine family fails the requirements of this subpart.
- (h) If the sample-size calculation allows you to stop testing for a pollutant, you must continue measuring emission levels of that pollutant for any additional tests required under this section. However, you need not continue making the calculations specified in this section for that pollutant. This paragraph does not affect the requirements in section §1051.320.
- (i) You may elect to test more randomly chosen vehicles or engines than we require. Include these vehicles or engines in the sample-size calculations.

§1051.315 How do I know when my engine family fails the production-line testing requirements?

This section describes the pass-fail criteria for the production-line testing requirements. We apply this criteria on an engine family basis. See §1051.320 for the requirements that apply to individual vehicles or engines that fail a production-line test.

- (a) Calculate your test results. Round them to the number of decimal places in the emission standard expressed to one more decimal place.
- (1) Initial and final test results. Calculate and round the test results for each vehicle or engine. If you do several tests on a vehicle or engine, calculate the initial test results, then add them together and divide by the number of tests and round for the final test results on that vehicle or engine.
 - (2) Final deteriorated test results. Apply the deterioration factor for the engine family to the final test results (see §1051.240(c)).
- (b) Construct the following CumSum Equation for each engine family for HC, NO_x (or HC+NO_x), and CO emissions (and other regulated pollutants):

$$C_i = C_{i-1} + X_i - (STD + 0.25 \times \sigma)$$

Where:

C_i = The current CumSum statistic.

C_{i-1} = The previous CumSum statistic. For the first test, the CumSum statistic is 0 (i.e. $C_1 = 0$).

X_i = The current emission test result for an individual vehicle or engine.

STD = Emission standard.

- (c) Use final deteriorated test results to calculate the variables in the equation in paragraph (b) of this section (see §1051.315(a)).
- (d) After each new test, recalculate the CumSum statistic.
- (e) If you test more than the required number of vehicles or engines, include the results from these additional tests in the CumSum Equation.
- (f) After each test, compare the current CumSum statistic, C_i , to the recalculated Action Limit, H , defined as $H = 5.0 \times \sigma$.
- (g) If the CumSum statistic exceeds the Action Limit in two consecutive tests, the engine family fails the production-line testing requirements of this subpart. Tell us within ten working days if this happens. You may request to amend the application for certification to raise the FEL of the engine family at this point if you meet the requirements of §1051.225(f).
- (h) If you amend the application for certification for an engine family under §1051.225, do not change any previous calculations of sample size or CumSum statistics for the model year.

§1051.320 What happens if one of my production-line vehicles or engines fails to meet emission standards?

- (a) If you have a production-line vehicle or engine with final deteriorated test results exceeding one or more emission standards (see §1051.315(a)), the certificate of conformity is automatically suspended for that failing vehicle or engine. You must take the following actions before your certificate of conformity can cover that vehicle or engine:
 - (1) Correct the problem and retest the vehicle or engine to show it complies with all emission standards.
 - (2) Include in your written report a description of the test results and the remedy for each vehicle or engine (see §1051.345).
- (b) You may request to amend the application for certification to raise the FEL of the entire engine family at this point (see §1051.225).

§1051.325 What happens if an engine family fails the production-line requirements?

- (a) We may suspend your certificate of conformity for an engine family if it fails under §1051.315. The suspension may apply to all facilities producing vehicles or engines from an engine family, even if you find noncompliant vehicles or engines only at one facility.
- (b) We will tell you in writing if we suspend your certificate in whole or in part. We will not suspend a certificate until at least 15 days after the engine family fails. The suspension is effective when you receive our notice.
- (c) Up to 15 days after we suspend the certificate for an engine family, you may ask for a hearing (see §1051.820). If we agree before a hearing that we used erroneous information in deciding to suspend the certificate, we will reinstate the certificate.
- (d) Section 1051.335 specifies steps you must take to remedy the cause of the production-line failure. All the vehicles you have produced since the end of the last test period are presumed noncompliant and should be addressed

in your proposed remedy. We may require you to apply the remedy to engines produced earlier if we determine that the cause of the failure is likely to have affected the earlier engines.

(e) You may request to amend the application for certification to raise the FEL of the engine family before or after we suspend your certificate if you meet the requirements of §1051.225(f).

§1051.330 May I sell vehicles from an engine family with a suspended certificate of conformity?

You may sell vehicles that you produce after we suspend the engine family's certificate of conformity under §1051.315 only if one of the following occurs:

- (a) You test each vehicle or engine you produce and show it complies with emission standards that apply.
- (b) We conditionally reinstate the certificate for the engine family. We may do so if you agree to recall all the affected vehicles and remedy any noncompliance at no expense to the owner if later testing shows that the engine family still does not comply.

§1051.335 How do I ask EPA to reinstate my suspended certificate?

- (a) Send us a written report asking us to reinstate your suspended certificate. In your report, identify the reason for noncompliance, propose a remedy for the engine family, and commit to a date for carrying it out. In your proposed remedy include any quality control measures you propose to keep the problem from happening again.
- (b) Give us data from production-line testing that shows the remedied engine family complies with all the emission standards that apply.

§1051.340 When may EPA revoke my certificate under this subpart and how may I sell these vehicles again?

- (a) We may revoke your certificate for an engine family in the following cases:
 - (1) You do not meet the reporting requirements.
 - (2) Your engine family fails to comply with the requirements of this subpart and your proposed remedy to address a suspended certificate under §1051.325 is inadequate to solve the problem or requires you to change the vehicle's design or emission-control system.
- (b) To sell vehicles from an engine family with a revoked certificate of conformity, you must modify the engine family and then show it complies with the requirements of this part.
 - (1) If we determine your proposed design change may not control emissions for the vehicle's full useful life, we will tell you within five working days after receiving your report. In this case we will decide whether production-line testing will be enough for us to evaluate the change or whether you need to do more testing.
 - (2) Unless we require more testing, you may show compliance by testing production-line vehicles or engines as described in this subpart.
 - (3) We will issue a new or updated certificate of conformity when you have met these requirements.

§1051.345 What production-line testing records must I send to EPA?

Do all the following things unless we ask you to send us less information:

- (a) Within 30 calendar days of the end of each calendar quarter, send us a report with the following information:
 - (1) Describe any facility used to test production-line vehicles or engines and state its location.
 - (2) State the total U.S.-directed production volume and number of tests for each engine family.
 - (3) Describe how you randomly selected vehicles or engines.
 - (4) Describe your test vehicles or engines, including the engine family's identification and the vehicle's model

year, build date, model number, identification number, and number of hours of operation before testing for each test vehicle or engine.

- (5) Identify where you accumulated hours of operation on the vehicles or engines and describe the procedure and schedule you used.
 - (6) Provide the test number; the date, time and duration of testing; test procedure; initial test results before and after rounding; final test results; and final deteriorated test results for all tests. Provide the emission results for all measured pollutants. Include information for both valid and invalid tests and the reason for any invalidation.
 - (7) Describe completely and justify any nonroutine adjustment, modification, repair, preparation, maintenance, or test for the test vehicle or engine if you did not report it separately under this subpart. Include the results of any emission measurements, regardless of the procedure or type of vehicle.
 - (8) Provide the CumSum analysis required in §1051.315 for each engine family.
 - (9) Report on each failed vehicle or engine as described in §1051.320.
 - (10) State the date the calendar quarter ended for each engine family.
- (b) We may ask you to add information to your written report, so we can determine whether your new vehicles conform with the requirements of this subpart.
- (c) An authorized representative of your company must sign the following statement:
- We submit this report under Sections 208 and 213 of the Clean Air Act. Our production-line testing conformed completely with the requirements of 40 CFR part 1051. We have not changed production processes or quality-control procedures for the engine family in a way that might affect the emission control from production vehicles (or engines). All the information in this report is true and accurate, to the best of my knowledge. I know of the penalties for violating the Clean Air Act and the regulations. (Authorized Company Representative)
- (d) Send electronic reports of production-line testing to the Designated Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.
- (e) We will send copies of your reports to anyone from the public who asks for them. See §1051.815 for information on how we treat information you consider confidential.

§1051.350 What records must I keep?

- (a) Organize and maintain your records as described in this section. We may review your records at any time, so it is important to keep required information readily available.
- (b) Keep paper records of your production-line testing for one full year after you complete all the testing required for an engine family in a model year. You may use any additional storage formats or media if you like.
- (c) Keep a copy of the written reports described in §1051.345.
- (d) Keep the following additional records:
 - (1) A description of all test equipment for each test cell that you can use to test production-line vehicles or engines.
 - (2) The names of supervisors involved in each test.
 - (3) The name of anyone who authorizes adjusting, repairing, preparing, or modifying a test vehicle or engine and the names of all supervisors who oversee this work.
 - (4) If you shipped the vehicle or engine for testing, the date you shipped it, the associated storage or port facility, and the date the vehicle or engine arrived at the testing facility.
 - (5) Any records related to your production-line tests that are not in the written report.
 - (6) A brief description of any significant events during testing not otherwise described in the written report or in

this section.

(7) Any information specified in §1051.345 that you do not include in your written reports.

- (e) If we ask, you must give us projected or actual production figures for an engine family. We may ask you to divide your production figures by rated brake power, displacement, fuel type, or assembly plant (if you produce vehicles or engines at more than one plant).
- (f) Keep a list of vehicle or engine identification numbers for all the vehicles or engines you produce under each certificate of conformity. Give us this list within 30 days if we ask for it.
- (g) We may ask you to keep or send other information necessary to implement this subpart.

Subpart E—Testing In-use Engines [Reserved.]

Subpart F—Test Procedures

§1051.501 What procedures must I use to test my vehicles or engines?

This section describes test procedures that you used to show compliance with the requirements of this part. See §1051.235 to determine when testing is required for certification. See subpart D for the production-line testing requirements.

(a) Snowmobiles. For snowmobiles, use the equipment and procedures for spark-ignition engines in part 1065 of this chapter to show your snowmobiles meet the duty-cycle emission standards in §1051.103. Measure HC, NO_x (as applicable), CO, and CO₂ emissions using the dilute sampling procedures in part 1065 of this chapter. For steady-state testing, you may use raw-gas sampling methods (such as those described in 40 CFR part 91), provided they have been shown to produce measurements equivalent to the dilute sampling methods specified in part 1065 of this chapter. Use the duty cycle in §1051.505.

(b) Motorcycles and ATVs. For motorcycles and ATVs, use the equipment, procedures, and duty cycle in 40 CFR part 86, subpart F, to show your vehicles meet the exhaust emission standards in §1051.105 or §1051.107. Measure HC, NO_x, CO, and CO₂. If we allow you to certify ATVs based on engine testing, use the equipment, procedures, and duty cycle described or referenced in that section that allows engine testing. For motorcycles with engine displacement at or below 169 cc and all ATVs, use the driving schedule in paragraph (c) of Appendix I to 40 CFR part 86. For all other motorcycles use the driving schedule in paragraph (b) of Appendix I to part 86. With respect to vehicle-speed governors, test motorcycles and ATVs in their ungoverned configuration, unless we approve in advance testing in a governed configuration. We will only approve testing in a governed configuration if you can show that the governor is permanently installed on all production vehicles and is unlikely to be removed in-use. With respect to engine-speed governors, test motorcycles and ATVs in their governed configuration.

(c) Permeation testing.

- (1) Use the equipment and procedures specified in §1051.515 to measure fuel tank permeation emissions.
- (2) Prior to permeation testing of fuel hose, the hose must be preconditioned by filling the hose with the fuel specified in (d)(3) of this section, sealing the openings, and soaking the hose for 4 weeks at 23°C ±5° C. To measure fuel-line permeation emissions, use the equipment and procedures specified in SAE J30 (incorporated by reference in §1051.810). The measurements must be performed at 23°C using the fuel specified in paragraph (d)(3) of this section.

(d) Fuels. Use the fuels meeting the following specifications:

- (1) Exhaust. Use the fuels and lubricants specified in 40 CFR part 1065, subpart C, for all the testing and service accumulation we require in this part.
- (2) Fuel Tank Permeation.
 - (i) For the preconditioning soak described in §1051.515(a)(1) and fuel slosh durability test described in §1051.515(c)(4), use the fuel specified in Table 1 of §1065.210 blended with 10 percent ethanol by volume. As an alternative, you may use Fuel CE10, which is Fuel C as specified in ASTM D 471-98 (incorporated by reference in §1051.810) blended with 10 percent ethanol by volume.
 - (ii) For the permeation measurement test in §1051.515(b), use the fuel specified in Table 1 of §1065.210. As an alternative, you may use the fuel specified in paragraph (d)(2)(i) of this section.
- (3) Fuel Hose Permeation. Use the fuel specified in Table 1 of §1065.210 blended with 10 percent ethanol by volume for permeation testing of fuel lines and tanks. As an alternative, you may use Fuel CE10, which is Fuel

C as specified in ASTM D 471-98 (incorporated by reference in §1051.810) blended with 10 percent ethanol by volume .

(e) Special procedures for engine testing. (1) You may use special or alternate procedures, as described in §1065.10 of this chapter.

(2) We may reject data you generate using alternate procedures if later testing with the procedures in part 1065 of this chapter shows contradictory emission data.

(f) Special procedures for vehicle testing. (1) You may use special or alternate procedures, as described in paragraph (f)(3) of this section.

(2) We may reject data you generate using alternate procedures if later testing with the otherwise specified procedures shows contradictory emission data.

(3)(i) The test procedures specified for vehicle testing are intended to produce emission measurements equivalent to those that would result from measuring emissions during in-use operation using the same vehicle configuration . If good engineering judgment indicates that use of the procedures in this part for a vehicle would result in measurements that are not representative of in-use operation of that vehicle, you must notify us. If we determine that using these procedures would result in measurements that are significantly unrepresentative and that changes to the procedures will result in more representative measurements that do not decrease the stringency of emission standards or other requirements, we will specify changes to the procedures. In your notification to us, you should recommend specific changes you think are necessary.

(ii) You may ask to use emission data collected using other test procedures, such as those of the California Air Resources Board or the International Organization for Standardization. We will allow this only if you show us that these data are equivalent to data collected using our test procedures.

(iii) You may ask to use alternate procedures that produce measurements equivalent to those obtained using the specified procedures. In this case, send us a written request showing that your alternate procedures are equivalent to the test procedures of this part. If you prove to us that the procedures are equivalent, we will allow you to use them. You may not use alternate procedures until we approve them.

(iv) You may ask to use special test procedures if your vehicle cannot be tested using the specified test procedures (for example, it is incapable of operating on the specified transient cycle). In this case, send us a written request showing that you cannot satisfactorily test your engines using the test procedures of this part. We will allow you to use special test procedures if we determine that they would produce emission measurements that are representative of those that would result from measuring emissions during in-use operation. You may not use special procedures until we approve them.

§1051.505 What special provisions apply for testing snowmobiles?

Use the following special provisions for testing snowmobiles:

(a) Measure emissions by testing the engine on a dynamometer with the steady-state duty cycle described in the following Table:

Table 1 of §1051.505—5-mode Duty Cycle for Snowmobiles

Mode Number	Engine Speed (percent of maximum test speed)	Torque (percent of maximum test torque at maximum test speed)	Minimum Time in mode (minutes)	Weighting Factors
1	100	100	3.0	0.12
2	85	51	3.0	0.27
3	75	33	3.0	0.25
4	65	19	3.0	0.31
5	Idle	0	3.0	0.05

- (b) During idle mode, operate the engine with the following parameters:
- (1) Hold the speed within your specifications.
 - (2) Keep the throttle at the idle-stop position.
 - (3) Keep engine torque under 5 percent of the peak torque value at maximum test speed.
- (c) For the full-load operating mode, operate the engine at wide-open throttle.
- (d) Ambient temperatures during testing must be between 20° C and 30° C (68° F and 86° F), or other representative test temperatures, as specified in paragraph (g) of this section.
- (e) See part 1065 of this chapter for detailed specifications of tolerances and calculations.
- (f) You may test snowmobiles at ambient temperatures below 20°C or using intake air temperatures below 20°C if you show that such testing complies with §1065.10(c)(1). You must get our approval before you begin the emission testing. For example, the following approach would be appropriate to show that such testing complies with §1065.10(c)(1):
- (1) Using good engineering judgment, instrument a representative snowmobile built with a representative engine from the family being tested with an appropriate temperature measuring device located in the intake air plenum where fuel spitback is not likely to occur.
 - (2) Choose a time and location with the following weather conditions: windspeed less than 10 knots, no falling precipitation, air temperature between -20 °C and 0 °C (-4 °F and 32 °F).
 - (3) Operate the snowmobile until its engine reaches a steady operating temperature.
 - (4) Operate the snowmobile on a level surface free of other vehicle traffic. Operate the snowmobile at each specified engine speed corresponding to each mode in the emissions test specific to the engine being tested. When readings are stable, record the temperature in the intake air plenum and the ambient temperature. Calculate the temperature difference between the air in the plenum and the ambient air for each mode.
 - (5) Calculate the nominal intake air test temperature for each test mode as -10 °C (14°F) plus the temperature difference for the corresponding mode determined in (g)(4) of this section.
 - (6) Before the emissions test, select the appropriate carburetor jetting for -10 °C (14°F) conditions according to the jet chart. For each mode, maintain the inlet air temperature within 5 °C of the corresponding modal temperature calculated in (g)(5) of this section.
 - (7) Adjust other operating parameters to be consistent with operation at -10°C (14°F). For example, this may require that you modify the engine cooling system used in the laboratory to make its performance

representative of cold-temperature operation.

§1051.510 What special provisions apply for testing ATV engines? [Reserved]

§1051.515 How do I test my fuel tank for permeation emissions?

Measure permeation emissions by weighing a sealed fuel tank before and after a temperature-controlled soak.

(a) Preconditioning. To precondition your fuel tank, follow these five steps:

- (1) Fill the tank with the fuel specified in §1051.501(d)(2)(i), seal it, and allow it to soak at $28 \pm 5^\circ\text{C}$ for 20 weeks. Alternatively, the tank may be soaked for a shorter period of time at a higher temperature if you can show that the hydrocarbon permeation rate has stabilized.
- (2) Determine the fuel tank's internal surface area in square-meters accurate to at least three significant figures. You may use less accurate estimates of the surface area if you make sure not to overestimate the surface area.
- (3) Fill the fuel tank with the test fuel specified in §1051.501(d)(2)(ii) to its nominal capacity. If you fill the tank inside the temperature-controlled room or enclosure, do not spill any fuel.
- (4) Allow the tank and its contents to equilibrate to $28 \pm 2^\circ\text{C}$.
- (5) Seal the fuel tank using nonpermeable fittings, such as metal or Teflon™.

(b) Test run. To run the test, follow these nine steps for a tank that was preconditioned as specified in paragraph (a) of this section:

- (1) Weigh the sealed fuel tank and record the weight to the nearest 0.1 grams. (You may use less precise weights as long as the difference in mass from the start of the test to the end of the test has at least three significant figures.)
- (2) Carefully place the tank within a ventilated temperature-controlled room or enclosure. Do not spill any fuel.
- (3) Close the room or enclosure and record the time.
- (4) Ensure that the measured temperature in the room or enclosure is $28 \pm 2^\circ\text{C}$.
- (5) Leave the tank in the room or enclosure for 2 to 4 weeks, consistent with good engineering judgment (based on the permeation rate). Do not stop soaking before 4 weeks unless you know that you can measure the weight loss during the test to at least three significant figures earlier.
- (6) Hold the temperature of the room or enclosure to $28 \pm 2^\circ\text{C}$; measure and record the temperature at least daily.
- (7) At the end of the soak period, weigh the sealed fuel tank and record the weight to the nearest 0.1 grams. (You may use less precise weights as long as the difference in mass from the start of the test to the end of the test has at least three significant figures.)
- (8) Subtract the weight of the tank at the end of the test from the weight of the tank at the beginning of the test; divide the difference by the internal surface area of the fuel tank. Divide this g/m^2 value by the number of test days (using at least three significant figures) to calculate the $\text{g/m}^2/\text{day}$ emission rate.
Example: If a tank with an internal surface area of 1.51 m^2 weighed 31882.3 grams at the beginning of the test and weighed 31760.2 grams after soaking for 25.03 days, then the $\text{g/m}^2/\text{day}$ emission rate would be:
$$(31882.3\text{ g} - 31760.2\text{ g}) / 1.51\text{ m}^2 / 25.03\text{ days} = 3.23\text{ g/m}^2/\text{day}.$$
- (9) Round your result to the same number of decimal places as the emission standard.

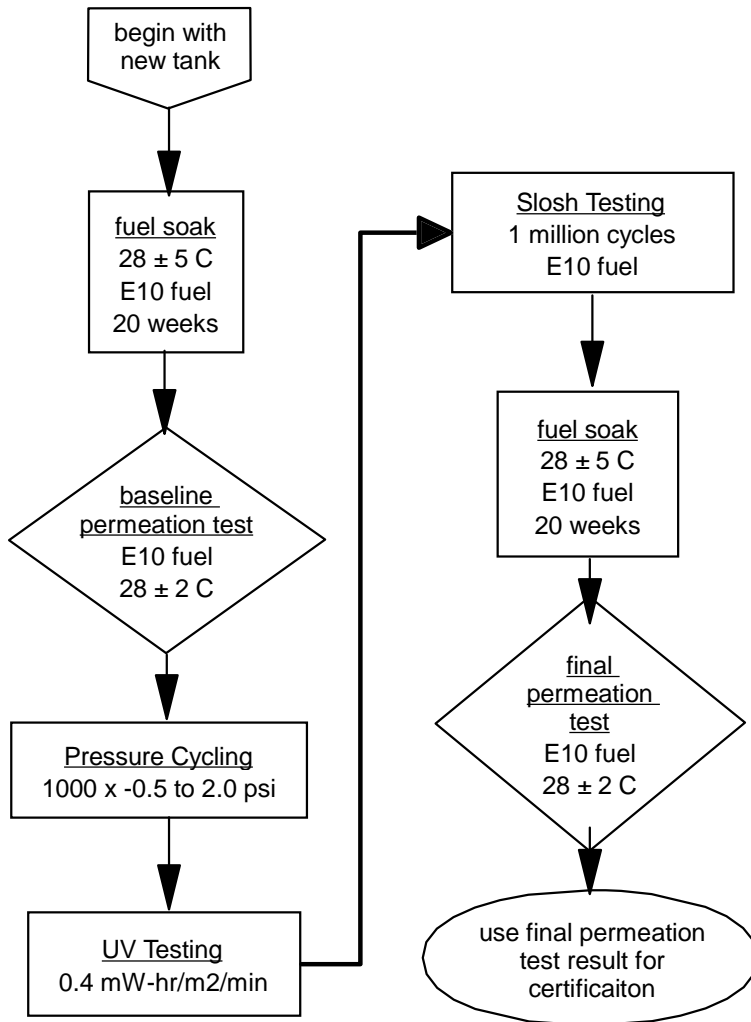
(c) Durability testing. You normally need to perform a separate durability demonstration for each substantially different combination of treatment approaches and tank materials. Perform these demonstrations before an emission test by taking the following steps, unless you can use good engineering judgment to apply the results of previous durability testing with a different fuel system. You can determine a deterioration factor by measuring emissions on a tank after these durability tests if you previously tested the same tank before the durability tests (but after the preconditioning step described in paragraph (a) of this section). For the purposes of deterioration factor determination, the permeation tests before and after the durability testing must be performed on the fuel specified in §1051.501 (d)(2)(i). You may ask to exclude any of the following durability tests if you can clearly demonstrate that it does not affect the emissions from your fuel tank.

- (1) Perform a pressure test by sealing the tank and cycling it between +2.0 psig and -0.5 psig and back to +2.0 psig for 10,000 cycles at a rate 60 seconds per cycle.
- (2) Perform a sunlight-exposure test by exposing the tank to an ultraviolet light of at least 0.40 W-hr/m²/min on the tank surface for 15 hours per day for 4 weeks. Alternatively, the fuel tank may be exposed to direct natural sunlight for an equivalent period of time, as long as you ensure that the tank is exposed to at least 450 daylight hours.
- (3) Perform a slosh test by filling the tank to 40 percent of its capacity with the fuel specified in §1051.501(d)(2)(i) and rocking it at a rate of 15 cycles per minute until you reach one million total cycles. Use an angle deviation of +15° to -15° from level. This test must be performed at a temperature of 28°C ±5° C.
- (4) Following the durability testing, the fuel tank must be soaked (as described in paragraph (a) of this section) to ensure that the permeation rate is stable. The period of slosh testing and the period of ultraviolet testing (if performed with fuel in the tank consistent with paragraph (a)(1) of this section) may be considered to be part of this soak, provided that the soak begins immediately after the slosh testing. To determine the final permeation rate, drain and refill the tank with fresh fuel, and repeat the test run (as described in paragraph (b) of this section) immediately after this soak period.

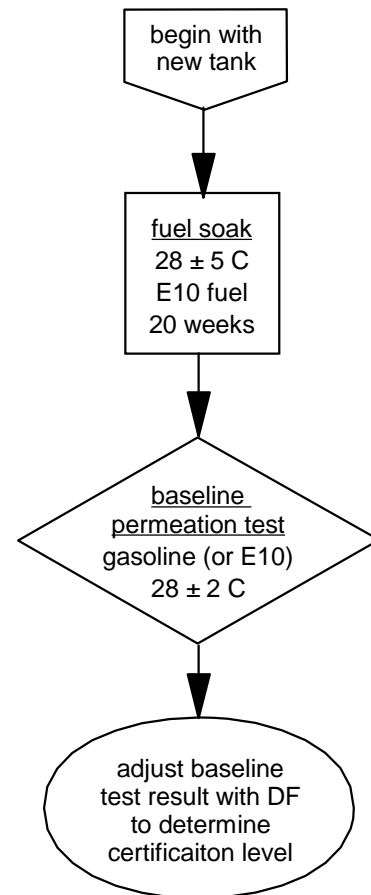
(d) Flow chart. The following figure presents a flow chart for the permeation testing described in this section, showing full test procedure with durability testing, as well as the simplified test procedure with an applied deterioration factor.

Figure 1051.515-1: Flow Chart of Permeation Test Procedure with and without DF Determination

1: Full Test Procedure



2: Base Test with DF*



* The deterioration factor (DF) is the difference between the baseline and final permeation tests in Option 1

§1051.520 How do I perform exhaust durability testing?

This section applies for durability testing to determine deterioration factors for exhaust emissions. Small-volume manufacturers may omit durability testing if they use our assigned deterioration factors that we establish based on our projection of the likely deterioration in the performance of specific emission controls.

- (a) Calculate your deterioration factor by testing a vehicle or engine that is representative of your engine family at a low-hour test point and the end of its useful life. You may also test at intermediate points.
- (b) Operate the vehicle or engine over a representative duty cycle for a period at least as long as the useful life (in hours or kilometers). You may operate the vehicle or engine continuously.
- (c) You may perform critical emission-related maintenance during durability testing, consistent with §1051.125(a). You may not perform any other emission-related maintenance during durability testing.
- (d) Use a linear least-squares fit of your test data for each pollutant to calculate your deterioration factor.
- (e) You may ask us to allow you to use other testing methods to determine deterioration factors, consistent with good engineering judgment.

Subpart G—Compliance Provisions

§1051.601 What compliance provisions apply to vehicles and engines subject to this part?

Engine and vehicle manufacturers, as well as owners, operators, and rebuilders of these vehicles, and all other persons, must observe the requirements and prohibitions in part 1068 of this chapter and the requirements of the Act. The compliance provisions in this subpart apply only to the vehicles and engines we regulate in this part.

§1051.605 What are the provisions for exempting vehicles from the requirements of this part if they use engines you have certified under the motor-vehicle program or the Large Spark-ignition program?

(a) You may ask for an exemption under this section if you are the manufacturer of an engine certified under the motor-vehicle program or the Large Spark-ignition program. See §1051.610 if you are not the engine manufacturer.

(b)(1) The only requirements or prohibitions from this part that apply to a vehicle that is exempt under this section are in this section and §1051.610.

(2) If the vehicles do not meet the criteria listed in paragraph (c) of this section, they will be subject to the standards and prohibitions of this part. Producing these vehicles without a valid exemption or certificate of conformity would violate the prohibitions in §1068.101 of this chapter.

(3) Vehicles exempted under this section are subject to all the requirements affecting engines and vehicles under 40 CFR part 86 or part 1048, as applicable. The requirements and restrictions of 40 CFR part 86 or 1048 apply to anyone manufacturing these engines, anyone manufacturing vehicles that use these engines, and all other persons in the same manner as if these engines were used in a motor vehicle or other nonrecreational application.

(c) If you meet all the following criteria regarding your engine, the vehicle using the engine is exempt under this section:

(1) The vehicle is produced using an engine or incomplete vehicle covered by a valid certificate of conformity under 40 CFR part 86 or part 1048.

(2) No changes are made to the certified engine or vehicle that we could reasonably expect to increase any of its regulated emissions. For example, if any of the following changes are made to the engine, it does not qualify for this exemption:

(i) Any fuel system or evaporative system parameters are changed from the certified configuration (this does not apply to refueling emission controls).

(ii) Any other emission-related components are changed.

(iii) The engine cooling system is modified or assembled so that temperatures or heat rejection rates are outside the original engine's specified ranges.

(3) The engine must have the emission control information label we require under 40 CFR part 86 or part 1048.

(4) You must demonstrate that fewer than 50 percent of the engine model's total sales, from all companies, are used in recreational vehicles.

(d) If you manufacture both the engine and vehicle under this exemption, you must do all of the following to keep the exemption valid:

(1) Make sure the original emission control information label is intact.

(2) Add a permanent supplemental label to the engine in a position where it will remain clearly visible after

installation in the vehicle. In your engine's emission control information label, do the following:

- (i) Include the heading: "Recreational Vehicle Emission Control Information".
- (ii) Include your full corporate name and trademark.
- (iii) State: "THIS ENGINE WAS ADAPTED FOR RECREATIONAL USE WITHOUT AFFECTING ITS EMISSION CONTROLS."
- (iv) State the date you finished installation (month and year).

(3) Make sure the original and supplemental labels are readily visible after the engine is installed in the vehicle or, if the vehicle obscures the engine's emission control information label, make sure the vehicle manufacturer attaches duplicate labels, as described in §1068.105 of this chapter.

(4) Send the Designated Officer a signed letter by the end of each calendar year (or less often if we tell you) with all the following information:

- (i) Identify your full corporate name, address, and telephone number.
- (ii) List the models you expect to produce under this exemption in the coming year.
- (iii) State: "We produce each listed model for recreational application without making any changes that could increase its certified emission levels, as described in 40 CFR 1051.605."

(e) If we request it, you must send us emission test data on the applicable recreational duty cycle(s). You may include the data in your application for certification under 40 CFR part 86 or part 1048, or in your letter requesting the exemption. We will generally not ask you for these data under normal circumstances, especially when they are more readily available from another source.

§1051.610 What are the provisions for producing recreational vehicles with engines already certified under the motor-vehicle program or the Large SI program?

(a) You may produce a recreational vehicle without certifying it under this part by using a certified motor vehicle engine, or Large SI engine. This section does not apply if you manufacture the engine yourself; see §1051.605. In order to produce recreational vehicles under this section, you must meet all of the following criteria:

- (1) The engine or vehicle is certified to 40 CFR part 86 or part 1048.
- (2) The engine is not adjusted outside the certifying manufacturer's specifications (see §1051.605(c)(2)).
- (3) The engine or vehicle is not modified in any way that may affect its emission control. This does not apply to refueling emission controls.
- (4) The vehicle is labeled consistent with paragraph (c) of this section.

(b)(1) The only requirements or prohibitions from this part that apply to a vehicle that is exempt under this section are in this section and §1051.605.

(2) If the vehicles do not meet the criteria listed in §1051.605(c) and paragraph (c) of this section, they will be subject to the standards and prohibitions of this part. Producing these vehicles without a valid exemption or certificate of conformity would violate the prohibitions in §1068.101 of this chapter.

(3) Vehicles exempted under this section are subject to all the requirements affecting engines and vehicles under 40 CFR part 86 or part 1048, as applicable. The requirements and restrictions of 40 CFR part 86 or 1048 apply to anyone manufacturing these engines, anyone manufacturing vehicles that use these engines, and all other persons in the same manner as if these engines were used in a motor vehicle or other nonrecreational application.

(c) (1) Make sure the original emission control information label is intact after assembly in the vehicle.

- (2) Add a permanent supplemental label to the vehicle in a position where it will be clearly visible. In this emission control information label, do the following:

- (i) Include the heading: "Recreational Vehicle Emission Control Information".
 - (ii) Include your full corporate name and trademark.
 - (iii) State: "THIS ENGINE WAS ADAPTED FOR RECREATIONAL USE WITHOUT AFFECTING ITS EMISSION CONTROLS."
 - (iv) State the date you finished installation (month and year).
- (3) Send the Designated Officer a signed letter by the end of each calendar year (or less often if we tell you) with all the following information:
- (i) Identify your full corporate name, address, and telephone number.
 - (ii) List the models you expect to produce under this exemption in the coming year.
 - (iii) State: "We produce each listed model for recreational application without making any changes that could increase its certified emission levels, as described in 40 CFR 1051.605."
- (d) If you build recreational vehicles under this section, we may require (as a condition of the exemption) that you comply with the emission-related warranty and recall responsibilities of this part.
- (e) If you build a recreational vehicle using a motor vehicle engine that was certified as part of a vehicle-based engine family, we may require you to certify under this part instead of granting you an exemption under this part. If we do this, we may allow you to submit an abbreviated application for certification to show that you comply with the requirements of this part. You may reference the information in the original motor vehicle application.

§1051.615 What are the special provisions for certifying small recreational engines?

- (a) You may certify ATVs with engines that have total displacement of less than 100 cc to the following emission exhaust standards instead of certifying them to the exhaust emission standards of subpart B of this part:
- (1) 25.0 g/kW-hr HC+NO_x, with an FEL cap of 40.0 g/kW-hr HC+NO_x.
 - (2) 500 g/kW-hr CO.
- (b) You may certify off-highway motorcycles with engines that have total displacement of 70 cc or less to the following emission exhaust standards instead of certifying them to the exhaust emission standards of subpart B of this part:
- (1) 16.1 g/kW-hr HC+NO_x, with an FEL cap of 32.2 g/kW-hr HC+NO_x.
 - (2) 519 g/kW-hr CO
- (c) You may use the averaging, banking, and trading provisions of subpart H of this part to show compliance with this HC+NO_x standards (an engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meet the applicable emission standards using emission credits, and the vehicles within the family meet the family emission limit). You may not use averaging to meet the CO standards of this section.
- (d) Measure emissions by testing the engine on a dynamometer with the steady-state duty cycle described in Table 1 of this section.
- (1) During idle mode, hold the speed within your specifications, keep the throttle fully closed, and keep engine torque under 5 percent of the peak torque value at maximum test speed.
 - (2) For the full-load operating mode, operate the engine at wide-open throttle
 - (3) See part 1065 of this chapter for detailed specifications of tolerances and calculations.
 - (4) Table 1 follows:

Table 1 of §1051.615—
6-Mode Duty Cycle for Recreational Engines

Mode Number	Engine Speed (percent of maximum test speed)	Torque (percent of maximum test torque at test speed)	Minimum Time in mode (minutes)	Weighting Factors
1	85	100	5.0	0.09
2	85	75	5.0	0.20
3	85	50	5.0	0.29
4	85	25	5.0	0.30
5	85	10	5.0	0.07
6	Idle	0	5.0	0.05

(e) All other requirements and prohibitions of this part apply to these engines and vehicles.

§1051.620 When may a manufacturer obtain an exemption for competition recreational vehicles?

(a) We may grant you an exemption from the standards and requirements of this part for a new recreational vehicle on the grounds that it is to be used solely for competition. The provisions of this part other than those in this section do not apply to recreational vehicles that we exempt for use solely for competition.

(b) We will exempt vehicles that we determine will be used solely for competition. The basis of our determinations are described in paragraphs (b)(1), (b)(2), and (c) of this section. Exemptions granted under this section are good for only one model year and you must request renewal for each subsequent model year. We will not approve your renewal request if we determine the vehicles will not be used solely for competition.

(1) Off-highway motorcycles. Motorcycles that are marketed and labeled as only for competitive use and that meet at least four of the criteria listed in paragraphs (b)(1)(i) through (vi) of this section are considered to be used solely for competition, except in cases where other information is available that indicates that they are not used solely for competition. The following features are indicative of motorcycles used solely for competition:

- (i) The absence of a headlight or other lights.
- (ii) The absence of a spark arrestor.
- (iii) The absence of manufacturer warranty.
- (iv) Suspension travel greater than 10 inches.
- (v) Engine displacement greater than 50 cc.
- (vi) The absence of a functional seat. (For example, a seat less with than 30 square inches of seating surface would generally not be considered a functional seat).

(2) Snowmobiles and ATVs. Snowmobiles and ATVs meeting all of the following criteria are considered to be used solely for competition, except in cases where other information is available that indicates that they are not used solely for competition:

- (i) The vehicle or engine may not be displayed for sale in any public dealership.
- (ii) Sale of the vehicle must be limited to professional racers or other qualified racers.
- (iii) The vehicle must have performance characteristics that are substantially superior to

noncompetitive models.

- (c) Vehicles not meeting the applicable criteria listed in paragraph (b) of this section will be exempted only in cases where the manufacturer has clear and convincing evidence that the vehicles will be used solely for competition.
- (d) You must permanently label vehicles exempted under this section to clearly indicate that they are to be used only for competition. Failure to properly label a vehicle will void the exemption for that vehicle.
- (e) If we request it, you must provide us any information we need to determine whether the vehicles are used solely for competition.

§1051.625 What special provisions apply to unique snowmobile designs for small-volume manufacturers?

- (a) If you are a small-volume manufacturer, we may permit you to produce up to 600 snowmobiles per year that are certified to less stringent emission standards than those in §1051.103, as long as you meet all the conditions and requirements in this section.
- (b) To apply for alternate standards under this section, send the Designated Officer a written request. In your request, do two things:
 - (1) Show that the snowmobile has unique design, calibration, or operating characteristics that make it atypical and infeasible or highly impractical to meet the emission standards in §1051.103, considering technology, cost, and other factors.
 - (2) Identify the level of compliance you can achieve, including a description of available emission-control technologies and any constraints that may prevent more effective use of these technologies.
- (c) You must give us other relevant information if we ask for it.
- (d) An authorized representative of your company must sign the request and include the statement: “All the information in this request is true and accurate, to the best of my knowledge.”
- (e) Send your request for this extension at least nine months before the relevant deadline. If different deadlines apply to companies that are not small-volume manufacturers, do not send your request before the regulations in question apply to the other manufacturers.
- (f) If we approve your request, we will set alternate standards for your qualifying snowmobiles. These standards will not be above 400 g/kW-hr for CO or 150 g/kW-hr for HC.
- (g) You may produce these snowmobiles to meet the alternate standards we establish under this section as long as you continue to produce them at the same or lower emission levels.
- (h) You may not include snowmobiles you produce under this section in any averaging, banking, or trading calculations under Subpart H of this part.
- (i) You must meet all the requirements of this part, except as noted in this section.

§1051.630 What special provisions apply to unique snowmobile designs for all manufacturers?

- (a) We may permit you to produce up to 600 snowmobiles per year that are certified to the FELs listed in this section without new test data, as long as you meet all the conditions and requirements in this section.
- (b) You may certify these snowmobiles with FELs of 560 g/kW-hr for CO and 270 g/kW-hr for HC (using the normal certification procedures).
- (c) The emission levels described in this section are intended to represent worst-case emission levels. You may not certify snowmobiles under this section if good engineering judgment indicates that they have emission rates higher than these levels.
- (d) Include snowmobiles you produce under this section in your averaging calculations under Subpart H of this part.

(e) You must meet all the requirements of this part, unless the regulations of this part specify otherwise.

§1051.635 What provisions apply to new manufacturers that are small businesses?

(a) If you are a small business (as defined by the Small Business Administration) that manufactures recreational vehicles, but does not otherwise qualify for the small-volume manufacturer provisions of this part, you may ask us to designate you to be a small-volume manufacturer. You may do this whether you began manufacturing recreational vehicles before, during, or after 2002.

(b) We may set other reasonable conditions that are consistent with the intent of this section and the Act. For example, we may place sales limits on companies that we designate to be small-volume manufacturers under this section.

Subpart H—Averaging, Banking, and Trading for Certification

§1051.701 General provisions.

(a) You may average, bank, and trade emission credits for purposes certification as described in this subpart to show compliance with the standards of this part. To do this you must show that your average emission levels are below the applicable standards in subpart B of this part, or that you have sufficient credits to offset a credit deficit for the model year (as calculated in §1051.720). If you cannot show in your end-of-year report that your average emission levels are below the applicable standards in subpart B of this part, or that you have sufficient credits to offset a credit deficit for the model year, we may void the certificates for all families certified to FELs above the allowable average.

(b) The following averaging set restrictions apply:

(1) You may not average together engine families that are certified to different standards. You may, however, use banked credits that were generated relative to different standards, except as prohibited by paragraphs (2) and (3) of this paragraph (b), paragraph (e) of this section, or by other provisions in this part. For example, you may not average together within a model year off-highway motorcycles that are certified to the standards in §1051.105(a)(1) and §1051.105(a)(2); but you may use banked credits generated by off-highway motorcycles that are certified to the standards in §1051.105(a)(1) to show compliance with the standards in §1051.105(a)(2) in a later model year, and vice versa.

(2) There are separate averaging, banking, and trading programs for snowmobiles, ATVs, and off-highway motorcycles. You may not average or exchange banked or traded credits from engine families of one type of vehicle with those from engine families of another type of vehicle.

(3) You may not average or exchange banked or traded credits with other engine families if you use fundamentally different measurement procedures for the different engine families (for example, ATVs certified to chassis-based vs. engine-based standards). This paragraph (b)(3) does not restrict you from averaging together engine families that use test procedures that we determine provide equivalent emission results.

(4) You may not average or exchange banked or traded exhaust credits with evaporative credits, or vice versa.

(c) The definitions of Subpart I of this part apply to this subpart. The following definitions also apply:

(1) Average standard means a standard that allows you comply by averaging all your vehicles under this part. See subpart B of this part to determine which standards are average standards.

(2) Broker means any entity that facilitates a trade between a buyer and seller.

(3) Buyer means the entity that receives credits as a result of trade.

(4) Family emission limit (FEL) has the meaning given in it in §1051.801.

(5) Reserved credits means credits you have generated that we have not yet verified in reviewing the end-of-year report.

(6) Seller means the entity that provides credits during a trade.

(d) Do not include any exported vehicles in the certification averaging, banking, and trading program. Include only vehicles certified under this part.

§1051.705 How do I average emission levels?

- (a) As specified in subpart B of this part, certify each vehicle to a family emission limit (FEL).
- (b) Calculate a preliminary average emission level according to §1051.720 using projected U.S.-directed production volumes for your application for certification.
- (c) After the end of your model year, calculate a final average emission level according to §1051.720 for each type of recreational vehicle or engine you manufacture or import. Use actual U.S.-directed production volumes.
- (d) If your preliminary average emission level is below the allowable average standard, see §1051.710 for information about generating and banking emission credits. These credits will be considered reserved until we verify them in reviewing the end-of-year report.

§1051.710 How do I generate and bank emission credits?

- (a) If your average emission level is below the average standard, you may calculate credits according to §1051.720.
- (b) You may generate credits if you are a certifying manufacturer.
- (c) You may bank unused emission credits, but only after the end of the calendar year and after we have reviewed your end-of-year reports. Credits you generate do not expire.
- (d) During the calendar year and before you send in your end-of-year report, you may consider reserved any credits you originally designate for banking during certification. You may redesignate these credits for trading in your end-of-year report, but they are not valid to demonstrate compliance until verified.
- (e) You may use for averaging or trading any credits you declared for banking from the previous calendar year that we have not reviewed. But, we may revoke these credits later—following our review of your end-of-year report or audit actions. For example, this could occur if we find that credits are based on erroneous calculations; or that emission levels are misrepresented, unsubstantiated, or derived incorrectly in the certification process.

§1051.715 How do I trade emission credits?

- (a) You may trade only banked emission credits, not reserved credits.
- (b) You may trade banked credits to any certifying manufacturer.
- (c) If a negative credit balance results from a credit trade, both buyers and sellers are liable, except in cases involving fraud. We may void the certificates of all emission families participating in a negative trade.
 - (1) If you buy credits but have not caused the negative credit balance, you must only supply more credits equivalent to the amount of invalid credits you used.
 - (2) If you caused the credit shortfall, you may be subject to the requirements of §1051.730(b)(6).

§1051.720 How do I calculate my average emission level or emission credits?

- (a) Calculate your average emission level for each type of recreational vehicle or engine for each model year according to the following equation and round it to the nearest tenth of a g/km or g/kW-hr. Use consistent units throughout the calculation.

(1) For exhaust emissions:

(i) Calculate the average emission level as:

$$\text{Emission level} = \left[\sum_i (\text{FEL})_i \times (\text{UL})_i \times (\text{Production})_i \right] / \left[\sum_i (\text{Production})_i \times (\text{UL})_i \right]$$

Where:

FEL_i = The FEL to which the engine family is certified.

UL_i = The useful life of the engine family.

Production_i = The number of vehicles in the engine family.

(ii) Use U.S.-directed production projections for initial certification, and actual U.S.-directed production volumes to determine compliance at the end of the model year.

(2) For vehicles that have standards expressed as g/kW-hr and a useful life in km, convert the useful life to kW-hr based on the maximum power output observed over the emission test and an assumed vehicle speed of 30 km/hr as follows: UL (kW-hr) = UL (km) × Maximum Test Power (kW) ÷ 30 km/hr. [Note: It is not necessary to include a load factor, since credit exchange is not allowed between vehicles certified to g/kW-hr standards and vehicles certified to g/km standards.]

(3) For evaporative permeation standards expressed as g/m²/day, use the useful life value in years multiplied by 365.24, and calculate the average emission level as:

$$\text{Emission level} = \left[\sum_i (\text{FEL})_i \times (\text{UL})_i \times (\text{Production})_i \right] / \left[\sum_i (\text{Production})_i \times (\text{UL})_i \right]$$

Where, Production_i = The number of vehicles in the engine family times the average internal surface area of the vehicles' fuel tanks.

(b) If your average emission level is below the average standard, calculate credits available for banking according to the following equation and round them to the nearest tenth of a gram:

$$\text{Credit} = \left[(\text{Average standard} - \text{Emission level}) \right] \times \left[\sum_i (\text{Production})_i \times (\text{UL})_i \right]$$

(c) If your average emission level is above the average standard, calculate your preliminary credit deficit according to the following equation, rounding to the nearest tenth of a gram:

$$\text{Deficit} = \left[(\text{Emission level} - \text{Average standard}) \right] \times \left[\sum_i (\text{Production})_i \times (\text{UL})_i \right]$$

§1051.725 What information must I keep?

(a) Maintain and keep five types of properly organized and indexed records for each engine family:

- (1) Model year and EPA engine family.
- (2) FEL.
- (3) Useful life.
- (4) Projected U.S.-directed production volume for the model year.
- (5) Actual U.S.-directed production volume for the model year.

(b) Keep paper records of this information for three years from the due date for the end-of-year report. You may use any additional storage formats or media if you like.

(c) Keep a copy of all of the information you send us under §1051.730.

(d) We may ask you to keep or send other information necessary to implement this subpart.

§1051.730 What information must I report?

(a) Include the following information in each of your applications for certification:

- (1) A statement that, to the best of your belief, you will not have a negative credit balance for any type of recreational vehicle or engine when all credits are calculated. This means that if you believe that your average emission level will be above the standard (i.e., that you will have a deficit for the model year), you

must have banked credits (or project to have received traded credits) to offset the deficit.

(2) Detailed calculations of projected emission credits (zero, positive, or negative) based on U.S.-directed production projections. If you project a credit deficit, state the source of credits needed to offset the credit deficit.

(b) At the end of each model year, send an end-of-year report.

(1) Your report must include three things:

(i) Calculate in detail your average emission level and any emission credits (positive, or negative) based on actual U.S.-directed production volumes.

(ii) If your average emission level is above the allowable average standard, demonstrate that you have the credits needed to offset the credit deficit. If you cannot demonstrate that you have the credits at the time you submit your end-of-year report, we may void the certificates for all families certified to FELs above the allowable average.

(iii) If your average emission level is below the allowable average standard, state whether you will reserve the credits for banking.

(2) Base your U.S.-directed production volumes on the point of first retail sale. You may consider distributors to be the point of first retail sale if all their engines are sold to ultimate buyers in the United States.

(3) Send end-of-year reports to the Designated Officer within 120 days of the end of the model year. If you send reports later, you are violating the Act.

(4) If you generate credits for banking and you do not send your end-of-year reports within 120 days after the end of the model year, you may not use or trade the credits until we receive and review your reports. You may not use projected credits pending our review.

(5) You may correct errors discovered in your end-of-year report, including errors in calculating credits according to the following table:

If...	And if...	Then we...
(i) Our review discovers an error in your end-of-year report that increases your credit balance	the discovery occurs within 180 days of receipt	restore the credits for your use.
(ii) You discover an error in your report that increases your credit balance	the discovery occurs within 180 days of receipt	restore the credits for your use.
(iii) We or you discover an error in your report that increases your credit balance	the discovery occurs more than 180 days after receipt	do not restore the credits for your use.
(iv) We discover an error in your report that reduces your credit balance	at any time after receipt	reduce your credit balance

- (6) If our review of a your end-of year-report shows a negative balance, you may buy credits to bring your credit balance to zero. But you must buy 1.1 credits for each 1.0 credit needed. If enough credits are not available to bring your credit balance to zero within 90 days of when we notify you, we may void the certificates for all families certified to FELs above the allowable average.
- (c) Within 90 days of any credit trade, you must send the Designated Officer a report of the trade that includes three types of information:
- (1) The corporate names of the buyer, seller, and any brokers.
 - (2) Copies of contracts related to credit trading from the buyer, seller, and broker, as applicable.
- (d) Include in each report a statement certifying the accuracy and authenticity of its contents.
- (e) We may void a certificate of conformity for any emission family if you do not keep the records this section requires or give us the information when we ask for it.

§1051.735 Are there special averaging provisions for snowmobiles?

For snowmobiles, you may only use credits for the same phase or set of standards against which they were generated, except as allowed by this section.

- (a) Restrictions. (1) You may not use any Phase 1 or Phase 2 credits for Phase 3 compliance.
- (2) You may not use Phase 1 HC credits for Phase 2 HC compliance. However, because the Phase 1 and Phase 2 CO standards are the same, you may use Phase 1 CO credits for compliance with the Phase 2 CO standards.
- (b) Special credits for next phase of standards. You may choose to generate credits early for banking for purposes of compliance with later phases of standards as follows:
- (1) If your corporate average emission level at the end of the model year exceeds the applicable (current) phase of standards (without the use of traded or previously banked credits), you may choose to redesignate some of your snowmobile production to a calculation to generate credits for a future phase of standards. To generate credits the snowmobiles designated must have an FEL below the emission level of that set of standards. This can be done on a pollutant specific basis.
 - (2) Do not include the snowmobiles that you redesignate in the final compliance calculation of your average emission level for the otherwise applicable (current) phase of standards. Your average emission level for the remaining (non-redesignated) snowmobiles must comply with the otherwise applicable (current) phase of standards.
 - (3) Include the snowmobiles that you redesignate in a separate calculation of your average emission level for redesignated engines. Calculate credits using this average emission level relative to the specific pollutant in the future phase of standards. These credits may be used for compliance with the future standards.
 - (4) For generating early Phase 3 credits, you may generate credits for HC+NO_x or CO separately as described below:
 - (i) To determine if you qualify to generate credits in accordance with (1)-(3) above, you must meet the credit trigger level. For HC+NO_x this value is 62 g/kW-hr (which would be the HC+NO_x standard that would result from inputting the highest allowable CO standard (275 g/kW-hr) into the Phase 3 equation). For CO the value is 200 g/kW-hr (which would be the CO standard that would result from inputting the highest allowable HC+NO_x standard (90 g/kW-hr) into the Phase 3 equation).

(ii) HC+NO_x and CO credits for Phase 3 are calculated relative to the 62 g/kW-hr and 200 g/kW-hr values, respectively.

(5) Credits can also be calculated for Phase 3 using both sets of standards. Without regard to the trigger level values, if your net emission reduction for the redesignated averaging set exceeds the requirements of Phase 3 in §1051.103 (using both HC+NO_x and CO in the Phase 3 equation in §1051.103), then your credits are the difference between the Phase 3 reduction requirement of that section and your calculated value.

Subpart I—Definitions and Other Reference Information

§1051.801 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Act gives to them. The definitions follow:

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 that someone can adjust (including those which are difficult to access) and that, if adjusted, may affect emissions or engine performance during emission testing or normal in-use operation. You may ask us to exclude a parameter that is difficult to access if it cannot be adjusted to affect emissions without significantly degrading performance, or if you otherwise show us that it will not be adjusted in use in a way that affect emissions

Aftertreatment means relating to any system, component, or technology mounted downstream of the exhaust valve or exhaust port whose design function is to reduce exhaust emissions.

All-terrain vehicle means a land-based or amphibious nonroad vehicle that meets the criteria listed in paragraph (1) of this definition; or the criteria of paragraph (2) of this definition but not the criteria of paragraph (3) of this definition.

- (1) Vehicles designed to travel on four low pressure tires, having a seat designed to be straddled by the operator and handlebars for steering controls, and intended for use by a single operator and no other passengers are all-terrain vehicles.
- (2) Other all-terrain vehicles have three or more wheels and one or more seats, are designed for operation over rough terrain, and are intended primarily for transportation. Golf carts generally do not meet these criteria since they are generally not designed for operation over rough terrain.
- (3) Vehicles that meet the definition of "offroad utility vehicle" in this section are not all-terrain vehicles. However, §1051.1(a) specifies that some offroad utility vehicles are required to meet the same requirements as all-terrain vehicles.

Auxiliary emission-control device means any element of design that senses temperature, engine rpm, motive speed, transmission gear, atmospheric pressure, manifold pressure or vacuum, or any other parameter to activate, modulate, delay, or deactivate the operation of any part of the emission-control system. This also includes any other feature that causes in-use emissions to be higher than those measured under test conditions, except as we allow under this part. For example, an accelerator pump would be considered an auxiliary emission-control device.

Brake power means the usable power output of the engine not including power required to operate fuel pumps, oil pumps, or coolant pumps.

Broker means any entity that facilitates a trade of emission credits between a buyer and seller.

Calibration means the set of specifications and tolerances specific to a particular design, version, or application of a component or assembly capable of functionally describing its operation over its working range.

Certification means obtaining a certificate of conformity for an engine family that complies with the emission standards and requirements in this part.

Compression-ignition means relating to a type of reciprocating, internal-combustion engine that is not a spark-ignition engine.

Crankcase emissions means airborne substances emitted to the atmosphere from any part of the engine crankcase's ventilation or lubrication systems. The crankcase is the housing for the crankshaft and other related

internal parts.

Designated Officer means the Manager, Engine Programs Group (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

Emission-control system means any device, system, or element of design that controls or reduces the regulated emissions from a vehicle.

Emission-data vehicle means a vehicle or engine that is tested for certification.

Emission-related maintenance means maintenance that substantially affects emissions or is likely to substantially affect emissions deterioration.

Engine family means a group of vehicles with similar emission characteristics, as specified in §1051.230.

Evaporative means relating to fuel emissions that result from permeation of fuel through the fuel system materials and from ventilation of the fuel system.

Family emission limit (FEL) means an emission level declared by the manufacturer to serve in place of an emission standard for certification under the emission-credit program in subpart H of this part. The family emission limit must be expressed to the same number of decimal places as the emission standard it replaces.

Fuel system means all components involved in transporting, metering, and mixing the fuel from the fuel tank to the combustion chamber(s), including the fuel tank, fuel tank cap, fuel pump, fuel filters, fuel lines, carburetor or fuel-injection components, and all fuel-system vents.

Good engineering judgment has the meaning we give it in §1068.5 of this chapter.

Hydrocarbon (HC) means the hydrocarbon group on which the emission standards are based for each fuel type. For gasoline- and LPG-fueled engines, HC means total hydrocarbon (THC). For natural gas-fueled engines, HC means nonmethane hydrocarbon (NMHC). For alcohol-fueled engines, HC means total hydrocarbon equivalent (THCE).

Identification number means a unique specification (for example, model number/serial number combination) that allows someone to distinguish a particular vehicle or engine from other similar vehicle or engines.

Manufacturer has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures a vehicle or engine for sale in the United States or otherwise introduces a new vehicle or engine into commerce in the United States. This includes importers that import for resale.

Maximum brake power means the maximum brake power of an engine at test conditions.

Maximum test power means the maximum brake power of an engine at maximum test speed.

Maximum test speed has the meaning we give in §1065.515.

Maximum test torque means the torque output observed at wide-open throttle at a given speed.

Model year means one of the following things:

(1) For freshly manufactured vehicles or engines (see definition of “new” paragraph (1)), model year means one of the following:

(i) Calendar year.

(ii) Your annual new model production period if it is different than the calendar year. This must include January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year.

(2) For a vehicle or engine that is converted to a nonroad vehicle or engine after being placed into service in a motor vehicle, model year means the calendar year in which the vehicle or engine was originally produced (see definition of “new” paragraph (2)).

(3) For a nonroad vehicle excluded under §1051.5 that is later converted to operate in an application that is not

excluded, model year means the calendar year in which the vehicle was originally produced (see definition of “new” paragraph (3)).

(4) For engines that are not freshly manufactured but are installed in new nonroad vehicles, model year means the calendar year in which the engine is installed in the new nonroad vehicle. This installation date is based on the time that final assembly of the vehicle is complete (see definition of “new”, paragraph (4)).

(5) For a vehicle or engine modified by an importer (not the original manufacturer) who has a certificate of conformity for the imported vehicle or engine (see definition of “new” paragraph (5)), model year means one of the following:

- (i) The calendar year in which the importer finishes modifying and labeling the vehicle or engine.
- (ii) Your annual production period for producing vehicles or engines if it is different than the calendar year; follow the guidelines in paragraph (1)(ii) of this definition.

(6) For a vehicle or engine you import that does not meet the criteria in paragraphs (1) through (5) of the definition of “new” model year means the calendar year in which the manufacturer completed the original assembly of the vehicle or engine. In general, this applies to used equipment that you import without conversion or major modification.

Motor vehicle has the meaning we give in §85.1703(a) of this chapter. In general, motor vehicle means a self-propelled vehicle that can transport one or more people or any material, but does not include any of the following:

- (1) Vehicles having a maximum ground speed over level, paved surfaces no higher than 40 km per hour (25 miles per hour).
- (2) Vehicles that lack features usually needed for safe, practical use on streets or highways— for example, safety features required by law, a reverse gear (except for motorcycles), or a differential.
- (3) Vehicles whose operation on streets or highways would be unsafe, impractical, or highly unlikely. Examples are vehicles with tracks instead of wheels, very large size, or features associated with military vehicles, such as armor or weaponry.

New means relating to any of the following vehicles or engines:

- (1) A freshly manufactured engine or vehicle for which the ultimate buyer has never received the equitable or legal title. This kind of vehicle might commonly be thought of as “brand new.” In the case of this paragraph (1), the vehicle or engine is no longer new when the ultimate buyer receives this title or the product is placed into service, whichever comes first.
- (2) An engine originally manufactured as a motor vehicle engine that is later intended to be used in a piece of nonroad equipment. In this case, the engine ceases being a motor vehicle engine and becomes a “new nonroad engine”. The engine is no longer new when it is placed into nonroad service.
- (3) A nonroad engine that has been previously placed into service in an application we exclude under §1051.5 or exempt under 1051.620, where that engine is installed in a piece of equipment for which these exclusions or exemptions do not apply. The engine is no longer new when it is placed into nonroad service. For example, this would apply to a competition vehicle that is no longer used solely for competition.
- (4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in new nonroad equipment. The engine is no longer new when the ultimate buyer receives a title for the equipment or the product is placed into service, whichever comes first. This generally includes installation of used engines in new vehicles.
- (5) An imported nonroad vehicle or engine covered by a certificate of conformity issued under this part, where

someone other than the original manufacturer modifies the vehicle or engine after its initial assembly and holds the certificate. The vehicle or engine is no longer new when it is placed into nonroad service.

(6) An imported nonroad vehicle or engine that is not covered by a certificate of conformity issued under this part at the time of importation. This addresses uncertified engines and vehicles that have been placed into service in other countries and that someone seeks to import into the United States. Importation of this kind of new nonroad engine or vehicle is generally prohibited by part 1068 of this chapter.

Noncompliant vehicle or engine means a vehicle or engine that was originally covered by a certificate of conformity, but is not in the certified configuration or otherwise does not comply with the conditions of the certificate.

Nonconforming vehicle or engine means a vehicle or engine not covered by a certificate of conformity that would otherwise be subject to emission standards.

Nonmethane hydrocarbon means the difference between the emitted mass of total hydrocarbons and the emitted mass of methane.

Nonroad means relating to nonroad engines, or to vehicles or equipment that include nonroad engines.

Nonroad engine has the meaning given in §1068.30 of this chapter. In general this means all internal-combustion engines except motor vehicle engines, stationary engines, or engines used solely for competition. This part only applies to nonroad engines that are used in snowmobiles, off-highway motorcycles, and ATVs (see §1051.5).

Off-highway motorcycle means a two-wheeled vehicle with a nonroad engine and a seat (excluding marine vessels and aircraft). Note: highway motorcycles are regulated under 40 CFR part 86.

Offroad utility vehicle means a nonroad vehicle that has four or more wheels, seating for two or more persons, is designed for operation over rough terrain, and has either a rear payload 350 pounds or more or seating for six or more passengers. Vehicles intended primarily for recreational purposes that are not capable of transporting six passengers (such as dune buggies) are not offroad utility vehicles. [Note: §1051.1(a) specifies that some offroad utility vehicles are required to meet the requirements that apply for all-terrain vehicles.]

Oxides of nitrogen has the meaning given it in 40 CFR part 1065.

Phase 1 means relating to Phase 1 standards of §§1051.103, 1051.105, or 1051.107, , or other Phase 1 standards specified in subpart B of this part.

Phase 2 means relating to Phase 2 standards of §1051.103, or other Phase 2 standards specified in subpart B of this part.

Phase 3 means relating to Phase 3 standards of §1051.103, or other Phase 3 standards specified in subpart B of this part.

Physically adjustable range means the entire range over which an engine parameter can be adjusted, except as modified by §1051.115(c). For parts described in §1051.115(d), “physically adjustable range” means the adjustable range defined in that paragraph.

Placed into service means used for its intended purpose.

Point of first retail sale means the location at which the retail sale occurs. This generally means a dealership.

Recreational means, for purposes of this part, relating to snowmobiles, all-terrain vehicles, off-highway motorcycles, and other vehicles that we regulate under this part. Note that 40 CFR part 90 applies to other recreational vehicles.

Revoke means to discontinue the certificate for an engine family. If we revoke a certificate, you must apply

for a new certificate before continuing to produce the affected vehicles or engines. This does not apply to vehicles or engines you no longer possess.

Round means to round numbers according to ASTM E29-02 (incorporated by reference in §1051.810), unless otherwise specified.

Scheduled maintenance means adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems that is periodically needed to keep a part from failing or malfunctioning. It also may mean actions you expect are necessary to correct an overt indication of failure or malfunction for which periodic maintenance is not appropriate.

Small-volume manufacturer means:

(1) For motorcycles and ATVs, a manufacturer that sold motorcycles or ATVs before 2003 and had annual U.S.-directed production of no more than 5,000 off-road motorcycles and ATVs (combined number) in 2002 and all earlier calendar years. For manufacturers owned by a parent company, the limit applies to the production of the parent company and all of its subsidiaries.

(2) For snowmobiles, a manufacturer that sold snowmobiles before 2003 and had annual U.S.-directed production of no more than 300 snowmobiles in 2002 and all earlier model years. For manufacturers owned by a parent company, the limit applies to the production of the parent company and all of its subsidiaries.

(3) A manufacturer that we designate to be a small-volume manufacturer under §1051.635.

Snowmobile means a vehicle designed to operate outdoors only over snow-covered ground, with a maximum width of 1.5 meters or less.

Spark-ignition means relating to a gasoline-fueled engine, or any other engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

Suspend means to temporarily discontinue the certificate for an engine family. If we suspend a certificate, you may not sell vehicles or engines from that engine family unless we reinstate the certificate or approve a new one.

Test sample means the collection of vehicles or engines selected from the population of an engine family for emission testing.

Test vehicle or engine means a vehicle or engine in a test sample.

Total hydrocarbon means the combined mass organic compounds measured by our total hydrocarbon test procedure, expressed as a hydrocarbon with a hydrogen-to-carbon mass ratio of 1.85:1.

Total hydrocarbon equivalent means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, alcohols and aldehydes, or other organic compounds that are measured separately as contained in a gas sample, expressed as petroleum-fueled engine hydrocarbons. The hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

Ultimate buyer means ultimate purchaser.

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

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

Upcoming model year means for an engine family the model year after the one currently in production.

U.S.-directed production means the number of vehicle units, subject to the requirements of this part, produced by a manufacturer (and/or imported) for which the manufacturer has a reasonable assurance that sale was

or will be made to ultimate buyers in the United States.

Useful life means the period during which a vehicle is required to comply with all applicable emission standards, specified as a number of kilometers, hours, and/or calendar years. It must be at least as long as both of the following:

- (1) The expected average service life before the vehicle is remanufactured or retired from service.
- (2) The minimum useful life value.

Void means to invalidate a certificate or an exemption. If we void a certificate, all the vehicles produced under that engine family for that model year are considered noncompliant, and you are liable for each vehicle produced under the certificate and may face civil or criminal penalties or both. If we void an exemption, all the vehicles produced under that exemption are considered uncertified (or nonconforming), and you are liable for each vehicle produced under the exemption and may face civil or criminal penalties or both. You may not produce any additional vehicles using the voided exemption.

Wide-open throttle means maximum throttle opening. Unless this is specified at a given speed, it refers to maximum throttle opening at maximum speed. For electronically controlled or other engines with multiple possible fueling rates, wide-open throttle also means the maximum fueling rate at maximum throttle opening under test conditions.

§1051.805 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part:

°	degrees.
ASTM	American Society for Testing and Materials.
ATV	all-terrain vehicle.
cc	cubic centimeters.
cm	centimeter
C	Celsius.
CO	carbon monoxide.
CO ₂	carbon dioxide.
EPA	Environmental Protection Agency.
F	Fahrenheit.
g	grams.
g/gal/day	grams per gallon per test day.
g/m ² /day	grams per meter-square per test day.
Hg	mercury.
hr	hours.
km	kilometer.
kW	kilowatt.
LPG	liquefied petroleum gas.
m	meters.
mm	millimeters.
mW	milliwatts.
NMHC	nonmethane hydrocarbons.
NO _x	oxides of nitrogen (NO and NO ₂).
psig	pounds per square inches of gauge pressure
rpm	revolutions per minute.
SAE	Society of Automotive Engineers.
SI	spark-ignition.
THC	total hydrocarbon.
THCE	total hydrocarbon equivalent.
U.S.C.	United States Code.

§1051.810 What materials does this part reference?

We have incorporated by reference the documents listed in this section. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, OAR, Air and Radiation Docket and Information Center, 401 M Street, SW, Washington, DC 20460 or the Office of the Federal Register, 800 N. Capitol St., NW, 7th Floor, Suite 700, Washington, DC.

(a) ASTM material. Table 1 of §1051.810 lists material from the American Society for Testing and Materials that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428. Table 1 follows:

Table 1 of §1051.810—
ASTM Materials

Document number and name	Part 1051 reference
ASTM E29-02, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.	1051.801
ASTM D471-98, Standard Test Method for Rubber Property—Effect of Liquids.	1051.501
ASTM D814-95 (reapproved 2000), Standard Test Method for Rubber Property—Vapor Transmission of Volatile Liquids.	1051.245

(b) SAE material. Table 2 of §1051.810 lists material from the Society of Automotive Engineering that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096. Table 2 follows:

Table 2 of §1051.810—
SAE Materials

Document number and name	Part 1051 reference
SAE J2260, Nonmetallic Fuel System Tubing with One or More Layers, November 1996.	1051.245
SAE J1930, Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms, May 1998.	1051.135
SAE J30, Fuel and Oil Hoses, June 1998.	1051.245, 1051.501

§1051.815 How should I request EPA to keep my information confidential?

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method.

We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2.

(b) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.

(c) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in §2.204 of this chapter.

§1051.820 How do I request a hearing?

See 40 CFR part 1068, subpart G, for information related to hearings.

PART 1065—TEST PROCEDURES AND EQUIPMENT

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1065.1005 Symbols, acronyms, and abbreviations.

1065.1010 Reference materials.

1065.1015 Confidential information.

Authority: 42 U.S.C. 7401 - 7671(q).

Subpart A—Applicability and General Provisions

§1065.1 Applicability.

(a) This part describes the procedures that apply to testing that we require for the following engines or for equipment using the following engines:

- (1) Large nonroad spark-ignition engines we regulate under 40 CFR part 1048.
- (2) Vehicles that we regulate under 40 CFR part 1051 (i.e., recreational SI vehicles) that are regulated based on engine testing. See part 1051 to determine which vehicles may be certified based on engine test data.

(b) This part does not apply to any of the following engine or vehicle categories:

- (1) Light-duty highway vehicles (see 40 CFR part 86).
- (2) Heavy-duty highway Otto-cycle engines (see 40 CFR part 86).
- (3) Heavy-duty highway diesel engines (see 40 CFR part 86).
- (4) Aircraft engines (see 40 CFR part 87).
- (5) Locomotive engines (see 40 CFR part 92).
- (6) Land-based nonroad diesel engines (see 40 CFR part 89).
- (7) General marine engines (see 40 CFR parts 89 and 94)
- (8) Marine outboard and personal watercraft engines (see 40 CFR part 91).
- (9) Small nonroad spark-ignition engines (see 40 CFR part 90).

(c) This part is addressed to you as a manufacturer, but it applies equally to anyone who does testing for you, and to us when we conduct testing to determine if you meet emission standards.

(d) Paragraph (a) of this section identifies the parts of the CFR that define emission standards and other requirements for particular types of engines. In this part 1065, we refer to each these other parts generically as the “standard-setting part.” For example, 40 CFR part 1051 is always the standard-setting part for snowmobiles. Follow the standard-setting part if it differs from this part.

(e) For equipment subject to this part and regulated under equipment-based or vehicle-based standards, interpret the term “engine” in this part to include equipment and vehicles(see 40 CFR 1068.30).

§1065.5 Overview of test procedures.

(a) Some of the provisions of this part do not apply to all types of engines. For example, measurement of particulate matter is generally not required for spark-ignition engines. See the standard-setting part to determine which provisions in this part may not apply. Before using this part’s procedures, read the standard-setting part to answer at least the following questions:

- (1) How should I warm up the test engine before measuring emissions? Do I need to measure cold-start emissions during this warm-up segment of the duty cycle?
- (2) Do I measure emissions while the warmed-up engine operates over a steady-state schedule, a transient schedule, or both?
- (3) What are the speed and load points of the test cycle(s)?
- (4) Which exhaust constituents do I need to measure?
- (5) Does testing require full-flow dilute sampling? Is raw sampling acceptable? Is partial-flow dilute sampling acceptable?

- (6) Do any unique specifications apply for test fuels?
 - (9) What maintenance steps may I do before or between tests on an emission-data engine?
 - (7) Do any unique requirements apply to stabilizing emission levels on a new engine?
 - (8) Do any unique requirements apply to testing conditions, such as ambient temperatures or pressures?
 - (9) Are there special emission standards that affect engine operation and ambient conditions?
 - (10) Are there different emission standards apply to field testing under normal operation?
- (b) Follow the table below to see how this part divides testing specifications into subparts:

This subpart...	Describes these specifications or procedures...
Subpart A	General provisions for test procedures.
Subpart B	Equipment for testing.
Subpart C	Fuels and analytical gases for testing.
Subpart D	How to calibrate test equipment.
Subpart E	How to prepare engines for testing, including service accumulation.
Subpart F	How to test for emissions.
Subpart G	How to calculate emission levels from measured data.
Subpart H	How to measure particulate emissions.
Subpart I	How to measure emissions from engines fueled with an oxygenated fuel such as methanol or ethanol.
Subpart J	How to do field testing of in-use vehicles and equipment.
Subpart K	Definitions, abbreviations, and other reference information that apply to emission testing.

§1065.10 Other test procedures.

- (a) Your testing. These test procedures apply for all testing that you do to show compliance with emission standards, with a few exceptions listed in this section.
- (b) Our testing. These test procedures generally apply for testing that we do to determine if your engines comply with applicable emission standards. We may conduct other testing as allowed by the Act.
- (c) Exceptions. You may be allowed or required to use test procedures other than those specified in this part in the following cases:
 - (1) The test procedures in this part are intended to produce emission measurements equivalent to those that would result from measuring emissions during in-use operation using the same engine configuration installed in a piece of equipment. If good engineering judgment indicates that use of the procedures in this part for an engine would result in measurements that are not representative of in-use operation of that

engine, you must notify us. If we determine that using these procedures would result in measurements that are significantly unrepresentative and that changing the procedures will result in more representative measurements and not decrease the stringency of emission standards, we will specify changes to the procedures. In your notification to us, you should recommend specific changes you think are necessary.

(2) You may ask to use emission data collected using other test procedures, such as those of the California Air Resources Board or the International Organization for Standardization. We will allow this only if you show us that these data are equivalent to data collected using our test procedures.

(3) You may ask to use alternate procedures that produce measurements equivalent to those from the specified procedures. If you send us a written request showing your procedures are equivalent, and we agree that they are equivalent, we will allow you to use them. You may not use an alternate procedure until we approve them, either by: telling you directly that you may use this procedure; or issuing guidance to all manufacturers, which allows you to use the alternate procedure without additional approval.

(4) You may ask to use special test procedures if your engine cannot be tested under the specified procedures (for example, your engine cannot operate on the specified transient cycle). In this case, tell us in writing why you cannot satisfactorily test your engines using this part's procedures and ask to use a different approach. We will approve your special test procedures if we determine they would produce emission measurements that are representative of those that would result from measuring emissions during in-use operation. You may not use special procedures until we approve them.

(5) The standard-setting part may contain other specifications for test procedures that apply for your engines. In cases where it is not possible to comply with both the test procedures in those parts and the test procedures in this part, you must comply with the test procedures specified in the standard-setting part. Those other parts may also allow you to deviate from the test procedures of this part for other reasons.

§1065.15 Engine testing.

(a) This part describes the procedures for performing exhaust emission tests on engines that must meet emission standards.

(b) Generally, you must test an engine while operating it on a laboratory dynamometer over a prescribed sequence. (Subpart J of this part describes in-use testing of engines installed in vehicles or equipment.) You need to sample and analyze the exhaust gases generated during engine operation to determine the concentration of the regulated pollutants.

(c) Concentrations are converted into units of grams of pollutant per kilowatt-hour (g/kW-hr) or similar units for comparison to emission standards. If the applicable emission standards are expressed as g/bhp-hr, references in this part to kW should generally be interpreted to mean horsepower.

§1065.20 Limits for test conditions.

(a) Unless specified elsewhere in this chapter, you may conduct tests to determine compliance with duty-cycle emission standards at ambient temperatures of 20 - 30° C (68 - 86° F), ambient pressures of 600 - 775 mm Hg, and any ambient humidity level.

(b) Follow the standard-setting part for ambient conditions when testing to determine compliance with not-to-exceed or other off-cycle emission standards.

(c) For engine testing in a laboratory, you may heat, cool, and/or dehumidify the dilution air before it enters the CVS.

(d) For engine testing in a laboratory, if the barometric pressure observed while generating the maximum-torque curve changes by more than 25 mm Hg from the value measured when you started mapping, you must remap the engine. Also, to have a valid test, the average barometric pressure observed during the exhaust emission test must be within 25 mm Hg of the average observed during the maximum torque curve generation (see §1065.510).

Subpart B—Equipment and Analyzers

§1065.101 Overview.

This subpart describes equipment and analyzers for measuring emissions. Subpart D of this part describes how to calibrate these devices and subpart C of this part defines the accuracy and purity specifications of analytical gases.

§1065.105 Dynamometer and engine equipment specifications.

(a) The engine dynamometer system must be able to control engine torque and speed simultaneously over the applicable test cycles within the accuracies specified in §1065.530. If your dynamometer cannot meet the accuracy requirements in §1065.530, you must get our approval before using it. For transient testing, issue command set points for engine torque and speed at 5 Hz or greater (10 Hz recommended). Record feedback engine torque and speed at least once every second during the test. In addition to these general requirements, make sure your engine or dynamometer's readout signals for speed and torque meet the following accuracies for all testing:

- (1) Engine speed readout must be accurate to within ± 2 percent of the absolute standard value. A 60-tooth (or greater) wheel in combination with a common mode rejection frequency counter is considered an absolute standard for engine or dynamometer speed.
- (2) Engine flywheel torque readout must meet one of the two following standards for accuracy:
 - (i) Within ± 3 percent of the NIST true value torque (as defined in §1065.315).
 - (ii) The following accuracies:

If the full-scale torque value is...	Engine flywheel torque readout must be within...
$T \leq 550$ ft-lbs.	± 2.5 ft-lbs. of NIST true value
$550 < T \leq 1050$ ft-lbs.	± 5.0 ft-lbs. of NIST true value
$T > 1050$ ft-lbs.	± 10.0 ft-lbs. of NIST true value

(3) Option: You may use internal dynamometer signals (such as armature current) to measure torque if you can show that the engine flywheel torque during the test cycle conforms to paragraph (b)(2) of this section. Your measurements must compensate for increased or decreased flywheel torque because of the armature's inertia during accelerations and decelerations in the test cycle.

(b) To verify that the test engine has followed the test cycle correctly, collect the dynamometer or engine readout signals for speed and torque so you can statistically correlate the engine's actual performance with the test cycle (see §1065.530). Normally, to do this, you would convert analog signals from the dynamometer or engine into digital values for computer storage, but all conversions must meet two criteria:

- (1) Speed values used to evaluate cycles must be accurate to within 2 percent of the readout value for dynamometer or engine speed.
- (2) Engine flywheel torque values used to evaluate cycles must be accurate to within 2 percent of the readout value for dynamometer or engine flywheel torque.

(c) You may combine the tolerances in paragraphs (a) and (b) of this section if you use the root mean square (RMS) method and refer accuracies of the RMS values to absolute-standard or NIST true values.

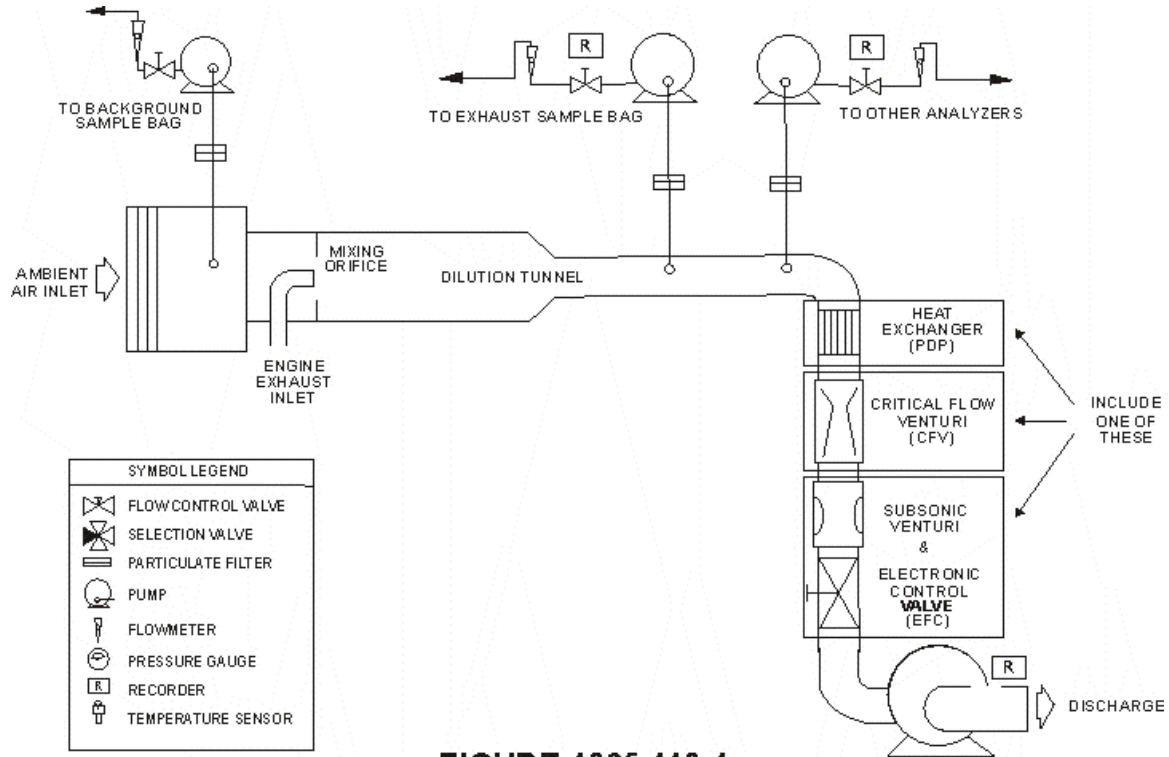
- (1) Speed values used to evaluate cycles must be accurate to within ± 2.8 percent of the absolute standard values, as defined in paragraph (a)(1) of this section.
- (2) Engine flywheel torque values used to evaluate cycles must be accurate to within ± 3.6 percent of NIST true values, as determined in §1065.315.

§1065.110 Exhaust gas sampling system; spark-ignition (SI) engines.

(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 SI engines. (If the standard-setting part requires determination of THCE or NMHCE for your engine, then see subpart I of this part for additional requirements.) Under the constant-volume sampler (CVS) concept, you must measure the total volume of the mixture of exhaust and dilution air and collect a continuously proportioned volume of sample for analysis. You must control flow rates so that the ratio of sample flow to CVS flow remains constant. You then determine the mass emissions from the sample concentration and total flow over the test period.

- (1) Do not let the CVS or dilution air inlet system artificially lower exhaust system backpressure. To verify proper backpressures, measure pressure in the raw exhaust immediately upstream of the inlet to the CVS. Continuously measure and compare the static pressure of the raw exhaust observed during a transient cycle—with and without the CVS operating. Static pressure measured with the CVS system operating must remain within ± 5 inches of water (1.2 kPa) of the static pressure measured when disconnected from the CVS, at identical moments in the test cycle. (Note: We will use sampling systems that can maintain the static pressure to within ± 1 inch of water (0.25 kPa) if your written request shows that this closer tolerance is necessary.) This requirement serves as a design specification for the CVS/dilution air inlet system, and should be performed as often as good engineering practice dictates (for example, after installing an uncharacterized CVS, adding an unknown inlet restriction on the dilution air, or otherwise altering the system).
- (2) The system for measuring temperature (sensors and readout) must have an accuracy and precision of $\pm 3.4^\circ\text{F}$ ($\pm 1.9^\circ\text{C}$). The temperature measuring system for a CVS without a heat exchanger must respond within 1.50 seconds to 62.5 percent of a temperature change (as measured in hot silicone oil). For a CVS with a heat exchanger, there is no specific requirement for response time.
- (3) The system for measuring pressure (sensors and readout) must have an accuracy and precision of ± 3 mm Hg (0.4 kPa).
- (4) The flow capacity of the CVS must be large enough to keep water from condensing in the system. You may dehumidify the dilution air before it enters the CVS. You also may heat or cool the air if three conditions exist:
 - (i) The air (or air plus exhaust gas) temperature does not exceed 250°F (121°C).
 - (ii) You calculate the CVS flow rate necessary to prevent water condensation based on the lowest temperature in the CVS before sampling. (We recommend insulating the CVS system when you use heated dilution air.)
 - (iii) The dilution ratio is high enough to prevent condensation in bag samples as they cool to room temperature.
- (5) Bags for collecting dilution air and exhaust samples must be big enough for samples to flow freely.
- (6) The general CVS sample system consists of a dilution air filter (optional) and mixing assembly, cyclone particulate separator (optional), a sample line for the bag sample or other sample lines a dilution tunnel, and

associated valves and sensors for pressure and temperature. Except for the system to sample hydrocarbons from two-stroke engines, the temperature of the sample lines must be more than 3° C above the mixture's maximum dew point and less than 121° C. We recommend maintaining them at $113 \pm 8^\circ \text{C}$. For the hydrocarbon sampling system with two-stroke engines, the temperature of the sample lines should be maintained at $191 \pm 11^\circ \text{C}$. A general schematic of the SI sampling system is shown in Figure 1065.110-1, which follows:



**FIGURE 1065.110-1
GENERIC GASEOUS EMISSIONS SAMPLING SYSTEM**

(b) Steady-state testing. Constant proportional sampling is required throughout transient testing, but is not required throughout steady-state testing. Steady-state testing requires that you draw a proportional sample for each test mode, but you may sample in different proportions for different test modes, as long as you know the ratio of the sample flow to total flow during each test mode. This allowance means that you may use simpler flow control systems for steady-state testing than are shown in Figure 1065.110-1 of this section.

(c) Configuration variations. Since various configurations can produce equivalent results, you need not conform exactly to the drawings in this subpart. You may use other components—such as instruments, valves, solenoids, pumps and switches—to provide more information and coordinate the components' functions. Based on good engineering judgment, you may exclude other components that are not needed to maintain accuracy on some systems.

(d) CFV-CVS component description. The flow characteristics of a Critical-Flow Venturi, Constant-Volume Sampler (CFV-CVS) are governed by the principles of fluid dynamics associated with critical flow. The CFV system is commonly called a constant-volume system (CVS) even though the mass flow varies. More properly, they are constant-proportion sampling systems, because small CFVs in each of the sample lines maintains proportional sampling while temperatures vary. This CFV maintains the mixture's flow rate at choked flow, which is inversely proportional to the square root of the gas temperature, and the system computes the actual flow rate continuously. Because pressures and temperatures are the same at all venturi inlets, the sample volume is proportional to the total volume. The CFV-CVS sample system uses critical flow venturis for the bag sample or other sample lines (these are shown in the figure as flow control valves) and a critical flow venturi for the dilution tunnel. All venturis must be maintained at the same temperature.

(e) EFC-CVS component description. The electronic flow control-CVS (EFC-CVS) system for sampling is identical to the CFV system described in paragraph (b) of this section, except that it adds electronic flow controllers (instead of sampling venturis), a subsonic venturi and an electronic flow controller for the CVS (instead of the critical flow venturi), metering valves, and separate flow meters (optional) to totalize sample flow volumes. The EFC sample system must conform to the following requirements:

- (1) They system must meet all the requirements in paragraph (b) of this section.
- (2) The ratio of sample flow to CVS flow must not vary by more than ± 5 percent from the test's setpoint.
- (3) Sample flow totalizers must meet the accuracy specifications in §1065.150. You may obtain total volumes from the flow controllers, with our advance approval, if you can show they meet these accuracies.

(f) Component description, PDP-CVS. The positive-displacement pump-CVS (PDP-CVS) system for sampling is identical to the CFV system described in paragraph (b) of this section, except for the following changes:

- (1) Include a heat exchanger.
- (2) Use positive-displacement pumps for the CVS flow and sampling-system flow. You do not need sampling venturis or a venturi for the dilution tunnel. All pumps must operate at a constant flow rate.
- (3) All pumps must operate at a nominally constant temperature. Maintain the gas mixture's temperature—measured at a point just ahead of the positive-displacement pump (and after the heat exchanger for the main CVS pump)—within $\pm 10^{\circ}$ F ($\pm 5.6^{\circ}$ C) of the average operating temperature observed during the test. (You may estimate the average operating temperature from the temperatures observed during similar tests.) The system for measuring temperature (sensors and readout) must have an accuracy and precision of $\pm 3.4^{\circ}$ F (1.9° C), and response time consistent with good engineering judgment.

(g) Mixed systems. You may combine elements of paragraphs (d), (e), and (f) consistent with good engineering

judgment. For example, you may control the CVS flow rate using a CFV, and control sample flow rates using electronic flow controllers.

§1065.115 Exhaust gas sampling system; compression-ignition engines. [Reserved]

§1065.120 Raw sampling. [Reserved]

§1065.125 Analyzers (overview/general response characteristics).

- (a) General. The following sections and subparts describe the specifications for analyzers and analytical equipment:
- (1) The analyzers for measuring hydrocarbon, NO_x, CO, and CO₂ emission concentrations are specified in §1065.130 through §1065.140.
 - (2) The analytical equipment for measuring particulate emissions is specified in Subpart H of this part.
 - (3) The analytical equipment for measuring emissions of oxygenated compounds (for example, methanol) is specified in Subpart I of this part.
 - (4) The analytical equipment for measuring in-use emissions is specified in Subpart J of this part.
- (b) Response time. Analyzers must have the following response characteristics:
- (1) For steady-state testing and transient testing with bag sample analysis, the analyzer must reach at least 90 percent of its final response within 5.0 seconds after any step change to the input concentration at or above 80 percent of full scale.
 - (2) For transient testing with continuous measurement, the analyzer must reach at least 90 percent of its final response within 1.0 second after any step change to the input concentration at or above 80 percent of full scale.
- (c) Precision and noise. Analyzers must meet the following characteristics for precision and noise:
- (1) Precision must be no worse than ± 1 percent of full-scale concentration for each range used above 155 ppm (or ppmC), or ± 2 percent for each range used below 155 ppm (or ppmC). For this paragraph, we define precision as 2.5 times the standard deviation of 10 repetitive responses to a given calibration or span gas.
 - (2) Peak-to-peak response to zero and calibration or span gases over any 10-second period must be no more than 2 percent of full-scale chart deflection on all ranges used.
- (d) Drift. Analyzers must meet specifications for zero-response and span drift.
- (1) The zero-response drift during one hour must be less than 2 percent of full-scale chart deflection on the lowest range used. Zero-response is the mean response, including noise, to a zero-gas during a 30-second interval.
 - (2) The span drift during one hour must be less than 2 percent of full-scale chart deflection on the lowest range used. Span is the difference between the span-response and the zero-response. Span-response is the mean response, including noise, to a span gas during a 30-second interval.
- (e) Calibration. See subpart D of this part for specifications to calibrate analyzers.

§1065.130 Hydrocarbon analyzers.

This section describes the requirements for flame ionization detectors (FIDs) used to measure hydrocarbons.

- (a) Fuel the FID with a mixture of hydrogen in helium and calibrate it using propane.
- (b) If you use a heated FID (required only for diesels and two-stroke, spark-ignition engines), keep the temperature $191 \pm 11^\circ \text{C}$.
- (c) Use an overflow sampling system for heated continuous FIDs. (In an overflow system excess zero gas or span gas spills out of the probe when you are doing zero or span checks.)
- (d) Do not premix the FID fuel and burner air.
- (e) Make sure the FID meets accuracy and precision specifications in ISO 8178-1 (incorporated by reference in §1065.1010).

§1065.135 NO_x analyzers.

This section describes the requirements for chemiluminescent detectors (CLD) used to measure NO_x. As described in paragraph (b) of this section, good engineering practice may require the use of other detectors.

- (a) A CLD must meet the following requirements:
 - (1) Make sure your CLD meets the accuracy and precision specifications in ISO 8178-1 (incorporated by reference in §1065.1010).
 - (2) The NO to NO₂ converter must have an efficiency of at least 90 percent.
 - (3) Use an overflow sampling system for continuous CLDs. (In an overflow system excess zero gas or span gas spills out of the probe when you are doing zero or span checks.)
 - (4) You do not need a heated CLD to test spark-ignition engines.
- (b) Using CLDs is generally acceptable even though they only NO and NO₂ measure, since conventional engines do not emit significant amounts of NO_x species.

§1065.140 CO and CO₂ analyzers.

This section describes the requirements for non-dispersive infrared absorption detectors (NDIR) to measure CO and CO₂.

- (a) The NDIR must meet the applicable accuracy and precision specifications of ISO 8178-1 (incorporated by reference in §1065.1010).
- (b) The NDIR must meet the applicable quench and interference requirements of ISO 8178-1 (incorporated by reference in §1065.1010).

§1065.145 Smoke meters. [Reserved]

§1065.150 Flow meters.

- (a) Flow meters must have accuracy and precision of ± 2 percent of point or better and be traceable to NIST standards.
- (b) You may correct flow measurements for temperature or pressure, if your temperature and pressure measurements have accuracy and precision of ± 2 percent of point or better (absolute).

§1065.155 Temperature and pressure sensors.

- (a) Except where we specify otherwise in this part, must meet the applicable accuracy and precision specifications of ISO 8178-1 (incorporated by reference in §1065.1010).
- (b) Use good engineering judgment to design and operate your temperature and pressure measuring systems to minimize delays in response time and avoid hysteresis.

Subpart C—Test Fuels and Analytical Gases

§1065.201 General requirements for test fuels.

- (a) For all emission tests, use test fuels meeting the specifications in this subpart, unless the standard-setting part directs otherwise. For any service accumulation on a test engine, if we do not specify a fuel, use the specified test fuel or a fuel typical of what you would expect the engine to use in service.
- (b) We may require you to test the engine with each type of fuel it can use (for example, gasoline and natural gas).
- (c) If you will produce engines that can run on a type of fuel (or mixture of fuels) that we do not specify in this subpart, we will allow you to test with fuel representing commercially available fuels of that type. However, we must approve your fuel's specifications before you may use it for emission testing.
- (d) You may use a test fuel other than those we specify in this subpart if you do all of the following:
 - (1) Show that it is commercially available.
 - (2) Show that your engines will use only the designated fuel in service.
 - (3) Show that operating the engines on the fuel we specify would increase emissions or decrease durability.
 - (4) Get our written approval before you start testing.
- (e) We may allow you to use other test fuels (for example, California Phase 2 gasoline) if they do not affect the demonstration of compliance.

§1065.205 Test fuel specifications for distillate diesel fuel. [Reserved]

§1065.210 Test fuel specifications for gasoline.

Gasoline used as a test fuel must meet the following specifications:

- (a) Unless the standard-setting part requires testing with fuel appropriate for low temperatures, use gasoline test fuels meeting the specifications in the following table:

Table 1 of §1065.210—General Test-Fuel Specifications for Gasoline

Item	Procedure¹	Value
Distillation Range:		
1. Initial boiling point, °C	ASTM D 86-01	23.9 - 35.0 ²
2. 10% point, °C	ASTM D 86-01	48.9 - 57.2
3. 50% point, °C	ASTM D 86-01	93.3 - 110.0
4. 90% point, °C	ASTM D 86-01	148.9 - 162.8
5. End point, °C (maximum)	ASTM D 86-01	212.8
Hydrocarbon composition:		
1. Olefins, volume %	ASTM D 1319-02	10 maximum
2. Aromatics, volume %	ASTM D 1319-02	35 maximum
3. Saturates	ASTM D 1319-02	Remainder
Lead (organic), g/liter	ASTM D 3237-97	0.013 maximum
Phosphorous, g/liter	ASTM D 3231-02	0.0013 maximum
Sulfur, weight %	ASTM D 1266-98	0.008 maximum
Volatility (Reid Vapor Pressure), kPa	ASTM D 323-99a	60.0 to 63.4 ^{2,3}

¹All ASTM standards are incorporated by reference in §1065.1010.

²For testing at altitudes above 1 219 m, the specified volatility range is 52 to 55 kPa (7.5 to 8.0) and the specified initial boiling point range is 23.9° to 40.6° C.

³For testing unrelated to evaporative emissions, the specified range is 55 to 63 kPa (8.0 to 9.1 psi).

(b) If the standard-setting part requires testing with fuel appropriate for low temperatures, use gasoline test fuels meeting the specifications in the following table:

Table 2 of §1065.210—Low-Temperature Test-Fuel Specifications for Gasoline

Item	Procedure¹	Value
Distillation Range:		
1. Initial boiling point, °C	ASTM D 86-01	24.4 - 35.6
2. 10% point, °C	ASTM D 86-01	36.7 - 47.8
3. 50% point, °C	ASTM D 86-01	81.7 - 101.1
4. 90% point, °C	ASTM D 86-01	157.8 - 174.4
5. End point, °C (maximum)	ASTM D 86-01	211.7
Hydrocarbon composition:		
1. Olefins, volume %	ASTM D 1319-02	17.5 maximum
2. Aromatics, volume %	ASTM D 1319-02	30.4 maximum
3. Saturates	ASTM D 1319-02	Remainder
Lead (organic), g/liter	ASTM D 3237-97	0.013 maximum
Phosphorous, g/liter	ASTM D 3231-02	0.005 maximum
Sulfur, weight %	ASTM D 1266-98	0.08 maximum
Volatility (Reid Vapor Pressure), kPa	ASTM D 323-99a	11.2 - 11.8 psi

¹All ASTM standards are incorporated by reference in §1065.1010.

(c) Use gasoline test fuel with octane values that represent commercially available fuels for the appropriate application.

§1065.215 Test fuel specifications for natural gas.

(a) Natural gas used as a test fuel must meet the specifications in the following table:

Table 1 of §1065.215—Test-Fuel Specifications for Natural Gas

Item	Procedure¹	Value (mole percent)
1. Methane	ASTM D 1945-96	87.0 minimum
2. Ethane	ASTM D 1945-96	5.5 maximum
3. Propane	ASTM D 1945-96	1.2 maximum
4. Butane	ASTM D 1945-96	0.35 maximum
3. Pentane	ASTM D 1945-96	0.13 maximum
4. C6 and higher	ASTM D 1945-96	0.1 maximum
5. Oxygen	ASTM D 1945-96	1.0 maximum
6. Inert gases (sum of CO ₂ and N ₂)	ASTM D 1945-96	5.1 maximum

¹All ASTM standards are incorporated by reference in §1065.1010.

(b) At ambient conditions, the fuel must have a distinctive odor detectable down to a concentration in air of not more than one-fifth of the lower flammability limit.

§1065.220 Test fuel specifications for liquefied petroleum gas.

(a) Liquefied petroleum gas used as a test fuel must meet the specifications in the following table:

Table 1 of §1065.220—Test-Fuel Specifications for Liquefied Petroleum Gas

Item	Procedure ¹	Value
1. Propane	ASTM D 2163-91	85.0 vol. percent minimum
2. Vapor pressure at 38° C	ASTM D 1267-02 or 2598-02 ²	14 bar maximum
3. Volatility residue (evaporated temp., 35° C)	ASTM D 1837-02	-38° C maximum
4. Butanes	ASTM D 2163-91	5.0 vol. percent maximum
5. Butenes	ASTM D 2163-91	2.0 vol. percent maximum
6. Pentenes and heavier	ASTM D 2163-91	0.5 vol. percent maximum
7. Propene	ASTM D 2163-91	10.0 vol. percent maximum
8. Residual matter (residue on evap. of 100 ml oil stain observ.)	ASTM D 2158-02	0.05 ml maximum pass ³
9. Corrosion, copper strip	ASTM D 1838-91	No. 1 maximum
10. Sulfur	ASTM D 2784-98	80 ppm maximum
11. Moisture content	ASTM D 2713-91	pass

¹All ASTM standards are incorporated by reference in §1065.1010.

²If these two test methods yield different results, use the results from ASTM D 1267-02.

³The test fuel must not yield a persistent oil ring when you add 0.3 ml of solvent residue mixture to a filter paper in 0.1 ml increments and examine it in daylight after two minutes (see ASTM D 2158-02).

(b) At ambient conditions, the fuel must have a distinctive odor detectable down to a concentration in air of not over one-fifth of the lower flammability limit.

§1065.240 Lubricating oils.

Lubricating oils you use to comply with this part must be commercially available and represent the oil that will be used with your in-use engines.

§1065.250 Analytical gases.

Analytical gases that you use to comply with this part must meet the accuracy and purity specifications of this section. You must record the expiration date specified by the gas supplier and may not use any gas after the expiration date.

(a) Pure gases. Use the "pure gases" shown in the following table:

Table 1 of §1065.250—Concentration Limits for Pure Gases

Gas Type	Maximum Contaminant Concentrations				Oxygen Content
	Organic Carbon	Carbon Monoxide	Carbon Dioxide	Nitric Oxide (NO)	
Purified Nitrogen	1 ppmC	1 ppm	400 ppm	0.1 ppm	NA
Purified Oxygen	NA	NA	NA	NA	99.5-100.0 %
Purified Synthetic Air, or Zero-Grade Air	1 ppmC	1 ppm	400 ppm	0.1 ppm	18-21 %

(b) Fuel for flame ionization detectors. Use a hydrogen-helium mixture as the fuel. Make sure the mixture contains 40±2 percent hydrogen and no more than 1 ppmC of organic carbon or 400 ppm of CO₂.

(c) Calibration and span gases. Apply the following provisions to calibration and span gases:

(1) Use the following gas mixtures, as applicable, for calibrating and spanning your analytical instruments:

(i) Propane in purified synthetic air. You may ask us to allow you to use propane in purified nitrogen for high concentrations of propane.

(ii) CO in purified nitrogen.

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

(iv) Oxygen in purified nitrogen.

(v) CO₂ in purified nitrogen.

(vi) Methane in purified synthetic air.

(2) The calibration gases in paragraph (c)(1) of this section must be traceable to within one percent of NIST gas standards or other gas standards we have approved. Span gases in paragraph (c)(1) of this section must be accurate to within two percent of true concentration, where true concentration refers to NIST gas standards, or other gas standards we have approved. Record concentrations of calibration gas as volume percent or volume ppm.

(3) You may use gases for species other than those in paragraph (c)(1) of this section (such as methanol in air gases used to determine response factors), as long as they meet the following criteria:

(i) They are traceable to within ±2 percent of NIST gas standards or other standards we have approved.

(ii) They remain within ±2 percent of the labeled concentration. Show this by measuring quarterly with a precision of ±2 percent (two standard deviations) or by using another method we approve. You may take multiple measurements. If the true concentration of the gas changes by more than two percent, but less than ten percent, you may relabel the gas with the new concentration.

(4) You may generate calibration and span gases using precision blending devices (gas dividers) to dilute gases with purified nitrogen or with purified synthetic air. Make sure the mixing device produces a concentration of blended calibration gases that is accurate to within ± 1.5 percent. To do so, you must know the concentration of primary gases used for blending to an accuracy of at least ± 1 percent, traceable to NIST gas standards or other gas standards we have approved. For each calibration incorporating a blending device, verify the blending accuracy between 15 and 50 percent of full scale. You may optionally

check the blending device with an instrument that is linear by nature (for example, using NO gas with a CLD). Adjust the instrument's span value with the span gas connected directly to it. Check the blending device at the used settings to ensure that the difference between nominal values and measured concentrations at each point stays within ± 0.5 percent of the nominal value.

(d) Oxygen interference gases. Gases to check oxygen interference are mixtures of oxygen, nitrogen, and propane. The oxygen concentration must be 20 - 22 percent and the propane concentration must be 50 - 90 percent of the maximum value in the most typically used FID range. Independently measure the concentration of total hydrocarbons plus impurities by chromatographic analysis or by dynamic blending.

Subpart D—Analyzer and Equipment Calibrations

§1065.301 Overview.

Calibrate all analyzers and equipment at least annually, but make the actual frequency consistent with good engineering judgment. We may establish other guidelines as appropriate. Calibrate following specifications in one of three sources:

- (a) Recommendations from the manufacturer of the analyzers or equipment.
- (b) 40 CFR part 86, subpart F or subpart N.
- (c) 40 CFR part 90, subparts D and E, as applicable.

§1065.305 International calibration standards.

- (a) You may ask to use international standards for calibration.
- (b) You need not ask for approval to use standards that have been shown to be traceable to NIST standards.

§1065.310 CVS calibration. [Reserved.]

§1065.315 Torque calibration.

You must use one of two techniques to calibrate torque: the lever-arm dead-weight or the transfer technique. You may use other techniques if you show they are equally accurate. The NIST "true value" torque is defined as the torque calculated by taking the product of an NIST traceable weight or force and a sufficiently accurate horizontal distance along a lever arm, corrected for the lever arm's hanging torque.

- (a) The lever-arm dead-weight technique involves placing known weights at a known horizontal distance from the torque-measuring device's center of rotation. You need two types of equipment:
 - (1) Calibration weights. This technique requires at least six calibration weights for each range of torque-measuring device used. Equally space the weights and make sure each one is traceable to NIST weights. You also may use weights certified by a U.S. state government's bureau of weights and measures. If your laboratory is outside the U.S., see §1065.305 for information about using non-NIST standards. You may account for effects of changes in gravitational constant at the test site.
 - (2) Lever arm. This technique also requires a lever arm at least 20 inches long. Make sure the horizontal distance from the torque-measurement device's centerline to the point where you apply the weight is accurate to within ± 0.10 inches. You must balance the arm or know its hanging torque to within ± 0.1 ft-lbs.
- (b) The transfer technique involves calibrating a master load cell (dynamometer case load cell). You may calibrate the master load cell with known calibration weights at known horizontal distances. Or you may use a hydraulically actuated, precalibrated, master load cell and then transfer this calibration to the device that measures the flywheel torque. The transfer technique involves three main steps:
 - (1) Precalibrate a master load cell or calibrate it following paragraph (a)(1) of this section. Use known weights traceable to NIST with the lever arms specified in paragraph (b)(2) of this section. Run or vibrate the dynamometer during this calibration to reduce static hysteresis.
 - (2) Use lever arms at least 20 inches long. The horizontal distances from the master load cell's centerline to the dynamometer's centerline and to the point where you apply weight or force must be accurate to within ± 0.10 inches. Balance the arms or know their net hanging torque to within ± 0.1 ft-lbs.

(3) Transfer calibration from the case or master load cell to the torque-measuring device with the dynamometer operating at a constant speed. Calibrate the torque-measurement device's readout to the master load cell's torque readout at a minimum of six loads spaced about equally across the full useful ranges of both measurement devices. (Good engineering practice requires that both devices have about the same useful ranges of torque measurement.) Transfer the calibration so it meets the accuracy requirements in §1065.105(a)(2) for readouts from the torque-measurement device.

Subpart E—Engine Selection, Preparation, and Service Accumulation

§1065.401 Selecting a test engine.

While all engine configurations within a certified engine family must comply with the applicable standards in the standard-setting part, you are not required to test each configuration for certification.

(a) Select for testing according to the following guidance the engine configuration within the engine family that is most likely to exceed an emission standard:

- (1) Test the engine that we specify, whether we do this through general guidance or give you specific instructions.
- (2) If we do not tell you which engine to test, follow any instructions in the standard-setting part.
- (3) If we do not tell you which engine to test and the standard-setting part does not include specifications for selecting test engines, use good engineering judgment to select the engine configuration within the engine family that is most likely to exceed an emission standard.

(b) In the absence of other information, the following characteristics are appropriate to consider when selecting the engine to test:

- (1) Maximum fueling rates.
- (2) Maximum in-use engine speed (governed or ungoverned, as applicable).
- (3) Highest sales volume.

(c) We may select any engine configuration within the engine family for our testing.

§1065.405 Preparing and servicing a test engine.

(a) If you are testing an emission-data engine for certification, make sure you have built it to represent production engines.

(b) Run the test engine, with all emission-control systems operating, long enough to stabilize emission levels. If you accumulate 50 hours of operation, you may consider emission levels stable without measurement.

(c) Do not service the test engine before you stabilize emission levels, unless we approve other maintenance in advance. This prohibition does not apply to your recommended oil and filter changes for newly produced engines, or to idle-speed adjustments.

(d) Select engine operation for accumulating operating hours on your test engines to represent normal in-use operation for the engine family.

(e) If you need more than 50 hours to stabilize emission levels, record your reasons and the method you use to do this. Give us these records if we ask for them.

§1065.410 Service limits for stabilized test engines.

(a) After you stabilize the test engine's emission levels, you may do scheduled maintenance, other than during emission testing, as the standard-setting part specifies.

(b) You may not do any unscheduled maintenance to the test engine or its emission-control system or fuel system without our advance approval. Unscheduled maintenance includes adjusting, repairing, removing, disassembling, cleaning, or replacing the test engine. We may approve routine maintenance that is not scheduled such as maintaining the proper oil level.

- (1) We may approve other unscheduled maintenance if all of the following occur:

- (i) You determine that a part failure or system malfunction (or the associated repair) does not make the engine unrepresentative of production engines in the field and does not require anyone to access the combustion chamber.
 - (ii) Something clearly malfunctions (such as persistent misfire, engine stall, overheating, fluid leakage, or loss of oil pressure) and needs maintenance or repair.
 - (iii) You give us a chance to verify the extent of the malfunction before you do the maintenance.
- (2) If we determine that a part's failure or a system's malfunction (or the associated repair) has made the engine unrepresentative of production engines, you may no longer use it as a test engine.
 - (3) You may not do unscheduled maintenance based on emission measurements from the test engine.
 - (4) Unless we approve otherwise in advance, you may not use equipment, instruments, or tools to identify bad engine components unless you specify they should be used for scheduled maintenance on production engines. In this case, if they are not generally available, you must also make them available at dealerships and other service outlets.
- (c) If you do maintenance that might affect emissions, you must completely test the engine for emissions before and after the maintenance, unless we waive this requirement.
 - (d) If your test engine has a major mechanical failure that requires you to take it apart, you may no longer use it as a test engine.

§1065.415 Durability demonstration.

If the standard-setting part requires durability testing, you must accumulate service in a way that represents how you expect the engine to operate in use. You may accumulate service hours using an accelerated schedule, such as through continuous operation.

- (a) Maintenance. The following limits apply to the maintenance that we allow you to do on test engine:
 - (1) You may perform scheduled maintenance that you recommend to operators, but only if it is consistent with the standard-setting part's restrictions.
 - (2) You may perform additional maintenance only if we approve it in advance, as specified in §1065.410(b).
 - (3) If your test engine has a major mechanical failure that requires you to take it apart, you may no longer use it as a test engine.
- (b) Emission measurements. You must measure emissions following two main requirements:
 - (1) Perform emission tests to determine deterioration factors consistent with good engineering judgment. Evenly space any tests between the first and last test points throughout the durability period.
 - (2) Perform emission tests following the provisions of this part and the standard-setting part.

Subpart F—Running an Emission Test

§1065.501 Overview of the engine dynamometer test procedures.

(a) The engine dynamometer test procedure measures brake-specific emissions of hydrocarbons (total and nonmethane, as applicable), carbon monoxide, and oxides of nitrogen. To perform this test procedure, you first dilute exhaust emissions with ambient air and collect a continuous proportional sample for analysis, then analyze the composite samples (either in bags after the test or continuously during the test). The general test procedure consists of a test cycle made of one or more segments (check the standard-setting part for specific cycles).

- (1) Either a cold-start cycle (where you measure emissions) or a warm-up cycle (where you do not measure emissions).
- (2) A hot-start transient test (some test cycles may omit engine starting from the "hot-start" cycle).
- (3) A steady-state test.

(b) Measure power using the dynamometer's feedback signals for torque and speed. The power measurement produces a brake kilowatt-hour value that allows you to calculate brake-specific emissions (see Subpart G of this part).

(c) Prepare engines for testing consistent with §1065.10(c)(1) and according to the following provisions:

- (1) When you test an engine or operate it for service accumulation, use the complete engine with all emission-control devices installed and functioning.
- (2) Install the fan for any air-cooled engine (if applicable).
- (3) You may install accessories such as an oil cooler, alternators, and air compressors or simulate their loading if they are typical of in-use operation. Apply this loading during all testing operations, including mapping.
- (4) You may install a production-type starter on the engine.
- (5) Cool the engine in a way that will maintain its operating temperatures including the intake air, oil, water temperatures about the same as they would be during normal operation. You may use auxiliary fans if necessary. You may use rust inhibitors and lubrication additives, up to the levels that the additive manufacturer recommends. You may also use antifreeze mixtures and other coolants typical of those approved for use by the manufacturer.
- (6) Use representative exhaust and air-intake systems. Make sure the exhaust restriction is 80 to 100 percent of the recommended maximum specified exhaust restriction and the air inlet restriction is between that of a clean filter and the maximum restriction specification. As the manufacturer, you are liable for emission compliance from the minimum in-use restrictions to the maximum restrictions you specify for that particular engine.

§1065.510 Engine mapping procedures.

(a) Torque map. Map your engine's torque while it is mounted on the dynamometer. Use the torque curve resulting from the mapping to convert the normalized torque values in the engine cycle to actual torque values for the test cycle. Make sure the speed ranges at least from the warm no-load idle speed to 105 percent of the maximum test speed. Because you determine the maximum test speed from the torque map, you may have to perform a preliminary torque map to determine the full mapping range. You may perform this preliminary torque map while the engine warms up. To map the engine, do the following things in sequence:

- (1) Warm up the engine so oil and water temperatures (on an absolute scale such as the Kelvin scale) vary by less than two percent for two minutes; or until the thermostat opens if the engine-coolant system includes a thermostat.
 - (2) Operate the engine at the warm no-load idle speed.
 - (3) Fully open the throttle.
 - (4) While maintaining wide-open throttle and full-load, keep the engine at minimum speed for at least 15 seconds. Record the average torque during the last 5 seconds.
 - (5) In increments of 100 ± 20 rpm, determine the maximum torque curve for the full speed range. Hold each test point for 15 seconds and record the average torque over the last 5 seconds. You may use larger increments for engines with maximum test speed over 4000 rpm, as long as you include at least 40 points and space them evenly.
 - (6) Fit all data points recorded with a cubic spline, Akima, or other technique we approve in advance. The resultant curve must be accurate to within ± 1.0 ft-lbs. of all recorded engine torques.
- (b) Torque map with continual engine speed sweep. In place of paragraphs (a)(1) through (a)(4) of this section, you may do a continual sweep of engine speed. While operating at wide-open throttle, increase the engine speed at an average rate of 8 ± 1 rpm/sec over the full speed range. You may use higher sweeping rates for naturally-aspirated engines, in accordance with good engineering judgment. Record speed and torque points at a rate of at least one point per second. Connect all points generated under this approach by linear interpolation.
- (c) Alternate mapping. You may use other mapping techniques if you believe those in paragraphs (a) and (b) of this section are unsafe or unrepresentative for any engine or engine family. These alternate techniques must satisfy the intent of the specified mapping procedures—to determine the maximum available torque at all engine speeds that occur during the test cycles. Report deviations from this section’s mapping techniques for reasons of safety or representativeness. In no case, however, may you use descending continual sweeps of engine speed for governed or turbocharged engines.
- (d) Replicate tests. You need not map an engine before every test, but you do need to remap the engine in any of the following situations:
- (1) Good engineering judgment determines that an unreasonable amount of time has passed since the last map.
 - (2) The barometric pressure before the test begins has changed more than 25 mm Hg from the average barometric pressure observed during the map.
 - (3) The engine has undergone physical changes or recalibration that might affect its performance.
- (e) Power map. Where applicable, generate a power map using the procedures this section specifies for torque maps. You may generate the power map directly or convert the torque map to a power map using engine speeds. The power map is also called a lug curve.
- (f) Cycles based only on torque/power at maximum test speed. If the applicable test cycle for your engine does not require map information for engine speeds other than the maximum test speed, you may make the following simplifications:
- (1) You need not perform the entire torque or power map, as long as you map the engines for speeds between 75 and 105 percent of the maximum test speed.
 - (2) You need not remap an engine according to paragraph (d) of this section. You need only verify the maximum torque or power at maximum test speed.

§1065.515 Test cycle generation.

(a) Denormalizing test cycles. The standard-setting parts establish the applicable test cycles consisting of second-by-second specifications for normalized torque and speed for transient cycles, or modal specifications for normalized torque and speed (or power and speed) for steady-state cycles. You must denormalize these values to get actual torque and speed for your engine.

(1) Torque is normalized to a maximum-torque value. Check the standard-setting part to see if it is normalized based on the maximum torque at the given speed or based on the maximum torque for all speeds. To denormalize the torque values in the cycle, use the engine's maximum-torque point or its torque map (§1065.510 describes how to generate the torque map).

(2) Power is normalized to a maximum-power value. Check the standard-setting part to see if it is normalized based on the maximum power at the given speed or based on the maximum power for all speeds. To denormalize the power values in the cycle, use the engine's maximum-power point or its power map (§1065.510 describes how to generate the power map).

(3) To denormalize speed, use the following equation:

$$\text{Actual engine speed} = (0.01) \times (\% \text{engine speed}) \times (\text{Maximum test speed} - \text{warm idle speed}) + \text{warm idle speed}$$

(4) Paragraph (d) of this section describes how to calculate maximum test speed.

(b) Example of denormalizing a test points. For an engine with maximum test speed of 3800 rpm and warm idle speed of 600 rpm, denormalize the following test point: percent engine speed = 43, percent torque = 82.

(1) Calculate actual engine speed. The following equation applies for this example: Actual engine speed = $(0.01) \times (43) \times (3800 - 600) + 600 = 1976$ rpm.

(2) Determine actual torque. Determine the maximum observed torque at 1976 rpm from the maximum torque curve. Then multiply this value (for example, 358 ft-lbs.) by 0.82. The resulting actual torque is 294 ft-lbs.

(c) Cold-start enhancement devices. If an engine has a properly operating automatic enhancement device for cold starts, let it override the zero-percent speed specified in the test cycles.

Proper operation of the engine's automatic cold-start enhancement device supersedes the zero-percent speed specified in the test cycles.

(d) Maximum test speed. For constant-speed engines, maximum test speed is the same as the engine's maximum operating speed in use. Maximum test speed for variable-speed engines occurs on the lug curve at the point farthest from the origin on a plot of power vs. speed. To find this speed, follow three main steps:

(1) Generate the lug curve. Before testing an engine for emissions, generate data points for maximum measured brake power with varying engine speed (see §1065.510). These data points form the lug curve.

(2) Normalize the lug curve. To normalize the lug curve, do three things:

(i) Identify the point (power and speed) on the lug curve where maximum power occurs.

(ii) Normalize the power values of the lug curve— divide them by the maximum power and multiply the resulting values by 100.

(iii) Normalize the engine speed values of the lug curve— divide them by the speed at which maximum power occurs and multiply the resulting values by 100.

(3) Determine maximum test speed. Calculate the maximum test speed from the following speed-factor analysis:

- (i) For a given power-speed point, the speed factor is the normalized distance to the power-speed point from the zero-power, zero-speed point. Compute the speed factor's value:

$$\textit{Speed factor} = \sqrt{(\textit{power})^2 + (\textit{speed})^2}$$

- (ii) Determine the maximum value of speed factors for all the power-speed data points on the lug curve. Maximum test speed is the speed at which the speed factor's maximum value occurs. Note that this maximum test speed is the 100-percent speed point for normalized transient duty cycles.

(e) Intermediate test speed. Determine intermediate test speed with the following provisions:

- (1) If peak torque speed is 60 to 75 percent of the maximum test speed, the intermediate speed point is at that same speed.
- (2) If peak torque speed is less than 60 percent of the maximum test speed, the intermediate speed point is at 60 percent of maximum test speed.
- (3) If peak torque speed is greater than 75 percent of the maximum test speed, the intermediate speed point is at 75 percent of maximum test speed.

§1065.520 Engine starting, restarting, and shutdown.

Unless the standard-setting part specifies otherwise, follow the steps in this section to start and shut down the test engine:

(a) Engine starting. Start the engine according to the manufacturer's recommended starting procedure in the owner's manual, using either a production starter motor or the dynamometer. Use the dynamometer to crank (or motor) the engine at the typical in-use cranking speed with a fully charged battery (nominal speed ± 10 percent), accelerating the engine to cranking speed in the same time it would take with a starter motor (nominal ± 0.5 seconds). Stop motoring by the dynamometer within one second of starting the engine. The cycle's free-idle period begins when you determine that the engine has started.

- (1) If the engine does not start after 15 seconds of cranking, stop cranking and determine the reason it failed to start. While diagnosing the problem, turn off the device that measures gas flow (or revolution counter) on the constant-volume sampler (and all integrators when measuring emissions continuously). Also, turn off the constant-volume sampler or disconnect the exhaust tube from the tailpipe. If failure to start is an operational error, reschedule the engine for testing (this may require soaking the engine if the test requires a cold-start).
- (2) If longer cranking times are necessary, you may use them instead of the 15-second limit, as long as the owner's manual and the service-repair manual describe the longer cranking times as normal.
- (3) If an engine malfunction causes a failure to start, you may correct it in less than 30 minutes and continue the test. Reactivate the sampling system at the same time cranking begins. When the engine starts, begin the timing sequence. If an engine malfunction causes a failure to start, and you cannot restart the engine, the test is void.

(b) Engine stalling. Respond to engine stalling as follows:

- (1) If the engine stalls during the warm-up period, the initial idle period of test, or the steady-state segment, you may restart the engine immediately using the appropriate starting procedure and continue the test.
- (2) If the engine stalls at any other time, the test is void.

(c) Engine shutdown. Shut the engine down according to the manufacturer's specifications.

§1065.525 Engine dynamometer test run.

Take the following steps for each test:

- (a) Prepare the engine, dynamometer, and sampling system. Change filters or other replaceable items and check for leaks as necessary.
- (b) If you are using bag samples, connect evacuated sample-collection bags to the collection system for the dilute exhaust and dilution air sample.
- (c) Attach the CVS to the engine's exhaust system any time before starting the CVS.
- (d) Start the CVS (if not already started), the sample pumps, the engine cooling fans, and the data-collection system. Before the test begins, preheat the CVS's heat exchanger (if used) and the heated components of any continuous sampling systems to designated operating temperatures.
- (e) Adjust the sample flow rates to the desired levels and set to zero the devices in the CVS that measure gas flow. The venturi design fixes the sample flow rate in a CFV-CVS.
- (f) Start the engine if engine starting is not part of the test cycle, as specified in the standard-setting part.
- (g) Run the test cycle specified in the standard-setting part and collect the test data.
- (h) As soon as practical after the test cycle is complete, analyze the bag samples.

§1065.530 Test cycle validation criteria.

- (a) Steady-state emission testing. Make sure your engine's speeds and loads stay within ± 2 percent of the set point during the sampling period.
- (b) Transient emission testing performed by EPA. Emission tests must meet the specifications of this paragraph (b). Otherwise, they do not comply with the test cycle requirements of the standard-setting part, unless we determine the cause of the failure to meet these specifications is related to the engine rather than the test equipment.
 - (1) Shifting feedback signals. The time lag between the feedback and reference-cycle values may bias results. To reduce this effect, you may advance or delay the entire sequence of engine-speed and torque-feedback signals with respect to the reference sequence for speed and torque. If you shift the feedback signals, you must shift speed and torque the same amount in the same direction.
 - (2) Calculating brake kilowatt-hour emissions. Calculate brake kilowatt-hour emissions for each pair of feedback values recorded for engine speed and torque. Also calculate the reference brake kilowatt-hour for each pair of reference values for engine speed and torque. Calculate to five significant figures.
 - (3) Performing regression-line analysis. Perform regression analysis to calculate validation statistics as follows:

- (i) Perform linear regressions of feedback value on reference value for speed, torque, and brake power on 1 Hz data after the feedback shift has occurred (see paragraph (b)(1) of this section). Use the method of least squares, with the best-fit equation having the form:

$$y = mx + b$$

Where:

y = The feedback (actual) value of speed (rpm), torque (ft-lbs.), or brake power.

m = Slope of the regression line.

x = The reference value (speed, torque, or brake power).

b = The y-intercept of the regression line.

(ii) Calculate the standard error of estimate (SE) of y on x and the coefficient of determination (r^2) for each regression line.

(iii) For a valid test, make sure the feedback cycle's integrated brake kilowatt-hour is within 5 percent of the reference cycle's integrated brake kilowatt-hour. Also, ensure that the slope, intercept, standard error, and coefficient of determination meet the criteria in the following table (you may delete individual points from the regression analyses, consistent with good engineering judgment):

Table 1 of §1065.530—
Statistical Criteria for Validating Test Cycles

	Speed	Torque	Power
1. Slope of the regression line (m)	0.980 to 1.020	0.880 to 1.030	0.880 to 1.030
2. Y intercept of the regression line (b)	$ b \leq 40$ rpm	$ b \leq 5.0$ percent of maximum torque from power map	$ b \leq 3.0$ percent of maximum torque from power map
3. Standard error of the estimate of Y on X (SE)	100 rpm	15 percent of maximum torque from power map	10 percent of maximum power from power map
4. Coefficient of determination (r^2)	$r^2 \geq 0.970$	$r^2 \geq 0.900$	$r^2 \geq 0.900$

(c) Transient testing performed by manufacturers. Emission tests that meet the specifications of paragraph (b) of this section satisfy the standard-setting part's requirements for test cycles. You may ask to use a dynamometer that cannot meet those specifications, consistent with good engineering practice. We will approve your request as long as using the alternate dynamometer does not affect your ability to show that you comply with all applicable emission standards.

Subpart G—Data Analysis and Calculations

§1065.601 Overview.

This subpart describes how to use the responses on the analyzers and other meters to calculate final gram per kilowatt-hour emission rates. Note: Volume and density values used in these calculations are generally corrected to standard conditions of 20°C and 101.3 kPa.

§1065.605 Required records.

Retain the following information for each test:

- (a) Test number.
- (b) System or device tested (brief description).
- (c) Date and time of day for each part of the test schedule.
- (d) Test results.
- (e) Operator's name.
- (f) Engine: ID number, manufacturer, model year, emission standards, engine family, basic engine description, fuel system, engine code, and idle speed, as applicable.
- (g) Dynamometer: Dynamometer identification, records to verify compliance with the duty cycle requirements of the test.
- (h) Gas analyzers: Analyzer bench identification, analyzer ranges, recordings of analyzer output during zero, span, and sample readings.
- (i) Recorder charts: Test number, date, identification, operator's name, and identification of the measurements recorded.
- (j) Test cell barometric pressure, ambient temperature, and humidity as required. (Some test systems may require continuous measurements; others may require a single measurement, or measurements before and after the test.)
- (k) Temperatures: Records to verify compliance with the ambient temperature requirements throughout the test procedure.
- (l) CFV-CVS: Total dilute exhaust volume (V_{mix}) for each phase of the exhaust test.
- (m) PDP-CVS: Test measurements for calculating the total dilute exhaust volume (V_{mix}), and the V_{mix} for each phase of the exhaust test.
- (n) The humidity of the dilution air. Note: If you do not use conditioning columns, this measurement is not necessary. If you use conditioning columns and take the dilution air from the test cell, you may use the ambient humidity for this measurement.

§1065.610 Bag sample analysis.

- (a) Zero the analyzers and obtain a stable zero reading. Recheck after tests.
- (b) Introduce span gases and set instrument gains. To avoid errors, span and calibrate at the same flow rates used to analyze the test sample. Span gases should have concentrations equal to 75 to 100 percent of full scale. If gain has shifted significantly on the analyzers, check the calibrations. Show actual concentrations on the chart.
- (c) Check zeroes; if necessary, repeat the procedure in paragraphs (a) and (b) of this section.
- (d) Check flow rates and pressures.
- (e) Measure HC, CO, CO₂, and NO_x concentrations of samples.

(f) Check zero and span points. If the difference is greater than 2 percent of full scale, repeat the procedure in paragraphs (a) through (e) of this section.

§1065.615 Bag sample calculations.

(a) Calculate the dilution factor. The dilution factor is the ratio of the total volume of the raw exhaust to the total volume of the diluted exhaust. It is calculated as 134,000 divided by the sum of the diluted ppmC concentrations of carbon-containing compounds in the exhaust, as follows:

$$DF = 134,000 / (CO_{2\text{sample}} + THC_{\text{sample}} + CO_{\text{sample}}),$$

Where:

$CO_{2\text{sample}}$ and CO_{sample} are expressed as ppm, and THC_{sample} is expressed as ppmC.

(b) Calculate mass emission rates (g/test) for the transient segment using the general equation in paragraph (b)(1) of this section:

(1) The general equation is:

emission rate = (total dilute exhaust flow volume)(ppm)(density factor)/ 10^6

$$M_x = (V_{\text{mix}})(C_i)(f_{\text{di}})/10^6$$

Where:

M_x = Mass emission rate in g/test segment.

V_{mix} = Total dilute exhaust flow volume flow in m^3 per test segment corrected to 20°C and 101.3 kPa.

C_i = The concentration of species i, in ppm or ppmC, corrected for background contribution according to the equation in paragraph (b)(2) of this section.

f_{di} = The density factor for species i. The density factors are 576.8 g/m^3 for THC, 1913 g/m^3 for NOx, and 1164 g/m^3 for CO.

(2) The equation to calculate C_i is:

$$C_i = C_{\text{sample}} - C_{\text{background}} [1 - (1/DF)]$$

Where:

C_{sample} = Concentration of species i in the diluted exhaust sample, in ppm or ppmC.

$C_{\text{background}}$ = Concentration of species i in the dilution air background sample, in ppm or ppmC.

DF = Dilution factor, as calculated in paragraph (a) of this section.

(c) Calculate total brake work (kW-hr) done during the emissions sampling period of each segment or mode.

(d) Calculate emissions in g/kW-hr by dividing the mass emission rate (g/test segment) by the total brake work for the test segment.

(e) Apply deterioration factors or other adjustment factors to the brake-specific emission rate in paragraph (e) as specified in the standard-setting part.

Subpart H—Particulate Measurements [Reserved]

Subpart I—Testing With Oxygenated Fuels

§1065.801 Applicability.

- (a) This subpart applies for testing with oxygenated fuels. Except where specified otherwise in the standard-setting part, compliance with this subpart is not required for fuels that contain less than 25 percent oxygenated compounds by volume. For example, you generally would not need to follow the requirements of this subpart for tests performed using a fuel that was 10 percent ethanol and 90 percent gasoline, but you would need to follow these requirements for tests performed using a fuel that was 85 percent ethanol and 15 percent gasoline.
- (b) This subpart specifies sampling procedures and calculations that are different than those used for non-oxygenated fuels. The other test procedures of this part apply for testing with oxygenated fuels.

§1065.805 Sampling system.

- (a) Use the sampling procedures specified in 40 CFR part 86 for methanol and formaldehyde to measure alcohols and aldehydes in the exhaust. This requires the following:
- (1) Bubbling a sample of the exhaust through water to collect the alcohols.
 - (2) Passing a sample of the exhaust through cartridges impregnated with 2,4-dinitrophenylhydrazine to measure aldehydes.
- (b) Use good engineering judgment to measure other oxygenated compounds in the exhaust.

§1065.810 Calculations.

- (a) THCE emissions. (1) Calculate THCE emissions as the sum of the mass of the nonoxygenated hydrocarbons in the exhaust and the carbon-equivalent mass of each measured oxygenated species in the exhaust.
- (2) Calculate carbon-equivalent mass of each measured oxygenated species from the following equation:

$$\text{Carbon equivalent} = 13.8756 \times \text{MOC} / \text{MWPC}$$

Where MOC is the mass of the oxygenated compound in the exhaust, and MWPC is the molecular weight of compound per carbon atom of compound.

- (b) NMHCE emissions. Calculate NMHCE emissions as either:
- (1) The sum of the mass of the nonoxygenated nonmethane hydrocarbons in the exhaust and the carbon-equivalent mass of each measured oxygenated species in the exhaust.
 - (2) THCE minus the mass of methane in the exhaust.
- (c) Sample calculation. (1) Assume the following emissions for a test: 40.00 grams of nonoxygenated hydrocarbons, 100.00 grams of ethanol, and 10.00 grams of acetaldehyde, and 1.00 gram of formaldehyde.
- (2) The carbon-equivalent of the masses of oxygenated compounds are:
 - (i) $13.8756 \times 100.00 / (46.068 / 2) = 60.24$ grams of ethanol.
 - (ii) $13.8756 \times 10.00 / (44.052 / 2) = 6.30$ grams of acetaldehyde.
 - (iii) $13.8756 \times 1.00 / (30.026) = 0.46$ grams of formaldehyde.
 - (3) $\text{THCE} = 40.00 + 60.24 + 6.30 + 0.46 = 107.00$ grams per test.

Subpart J—Field Testing

§1065.901 Applicability.

- (a) The test procedures in this subpart measure brake-specific emissions from engines while they remain installed in vehicles or equipment in the field.
- (b) These test procedures apply to your engines as specified in the standard-setting part. For example, part 1048 of this chapter specifies emission standard to be used for in-use tests conducted in accordance with the provisions of this part. Unless this subpart is specifically mentioned in the standard-setting part, compliance with the provisions of this subpart is not required.

§1065.905 General provisions.

- (a) Unless the standard-setting part specifies deviations from the provisions of this subpart, testing conducted under this subpart must conform to all of the provisions of this subpart.
- (b) Testing conducted under this subpart may include any normal in-use operation of the engine.

§1065.910 Measurement accuracy and precision.

- (a) Measurement systems used for in-use testing must be accurate to within ± 5 percent compared to engine dynamometer testing conducted according to the test procedures of this part that are applicable for your engine. These systems must also have a precision of ± 5 percent or better. Determine accuracy and precision of an in-use system by simultaneously measuring emissions using the engine-dynamometer test procedures of this part and the in-use system. To have a statistically valid sample, measure emissions during at least 3 tests each for at least 3 different engines. You must conduct these verification tests using the test cycle specified in the standard-setting part, unless we approve a different test cycle.
 - (1) A system must meet the following conditions to be considered sufficiently accurate:
 - (i) The correlation coefficient (r) for a least-squares linear fit that includes the origin must be 0.95 or higher.
 - (ii) The average ratio (for all tests) of the emission rate from the in-use system divided by the emission rate from the dynamometer procedure must be 0.97 to 1.05.
 - (2) For a system to be considered sufficiently precise, the average coefficient of variance for all engines must be 5 percent or less for each pollutant. Note: Increasing the length of the sampling period may be an effective way to improve precision.
- (b) Measurement systems that conform to the provisions of §§1065.915 through 1065.950 are considered to be in compliance with the accuracy and precision requirements of paragraph (a) of this section.

§1065.915 Equipment specifications for SI engines.

This section describes equipment you may use to measure in-use emissions. You may use other equipment and measurement systems that conform to the requirements of §§1065.905 and 1065.910.

- (a) The primary components of the in-use measurement system are a mass air flow sensor, a portable FID, a zirconia-based NO_x sensor, a zirconia-based air/fuel ratio sensor, and a portable NDIR analyzer.
 - (1) The mass air flow sensor must meet the requirements of §1065.930.
 - (2) The portable FID must meet the requirements of §1065.935.

- (3) The NO_x and air/fuel sensors must meet the requirements of §1065.940
- (4) The NDIR analyzer must meet the requirements of §1065.945.
- (b) You must measure the following parameters continuously at a rate of 3 Hz or higher and store the data electronically:
 - (1) THC, NO_x, CO concentrations.
 - (2) Mass air-fuel ratio.
 - (3) Intake air flow rate.
 - (4) Engine speed.
 - (5) Parameters used to calculate torque.
- (c) You must minimize sample line length for any analyzers that require a physical sample be drawn from the exhaust to the analyzer (i.e., THC and CO analyzers). You must draw these samples at a constant flow rate. In no case may you use any combination of sample line length and sample flow rate that would require more than 10 seconds for the analyzer to reach 90 percent of its final response after a step change to the input concentration at the opening of the sample probe. For residence time delays between 1 and 10 seconds, you must correct the measurements to be consistent with the data for engine speed, torque, and air intake. You may also correct other measurements with less than delays less than 1 second.
- (d) You may insert the sample probes and sensors into the exhaust pipe, or mount them in an exhaust extension that is connected to the exhaust pipe with negligible leaking. Place the sample probes and sensors close enough to the center line of the exhaust pipe to minimize boundary layer effects from the wall.

§1065.920 Equipment setup and test run for SI engines.

This section describes how to set up the equipment specified in §1065.915, and how to use it to measure in-use emissions from SI engines.

- (a) Inspect the vehicle or equipment to determine whether it meets any applicable requirements of the standard-setting part. This may include requirements related to model year, accumulated hours of operation, fuel specifications, maintenance history, engine temperatures, etc.
- (b) Perform calibrations as specified in this subpart. In the field, this generally will require only zeroing and spanning the instruments. However, each instrument must have been fully calibrated according to the instrument manufacturer's specifications. Nonlinear calibrations generated previously from the full calibration may be used after zeroing and spanning the instruments. Spanning can be performed using a single gas bottle, consistent with good engineering practice, and provided that stability of the span mixture has been demonstrated.
- (c) Connect the data recorder (with any necessary signal interpreters or converters) to the engine's electronic control module.
- (d) Disconnect the air intake system, as necessary, to attach the mass air flow sensor. Reconnect the system after attaching the mass air flow sensor.
- (e) Attach the sample extension to the exhaust outlet.
- (f) Turn on instruments and allow them to warm up as necessary.
- (g) Begin sampling. You do not need to begin recording the data at this point.
- (h) Begin operating the vehicle or equipment in a normal manner. Note: We may require you to operate the vehicle or equipment in a specific manner.
- (i) Begin recording engine speed, engine torque (or surrogate), intake air flow, emissions data (THC, NO_x, CO, air/fuel ratio), and time. This time marks the beginning of the sampling period.

- (j) Continue recording data and operating the vehicle or equipment in a normal manner until the end of the sampling period. The length of the sampling period is based on good engineering practice, the precision requirements of §1065.910, and applicable limits in the standard-setting part.
- (k) You may measure background concentrations and correct measured emission values accordingly. However, if any background corrections are equivalent to 5 percent or more of the maximum emissions allowed by the applicable standard, the test shall be voided and repeated in an environment with lower background concentrations.

§1065.925 Calculations.

- (a) [Reserved]
- (b) Convert emission analyzer data to instantaneous concentrations in ppm (ppmC for the FID).
- (c) Calculate instantaneous exhaust volumetric flow rates in standard m³/hr (volume and density values used in these calculations are corrected to standard conditions of 20°C and 101.3 kPa.). Calculate exhaust volumetric flow rate from the following equation:

$$\text{exhaust volumetric flow rate} = (\text{intake air mass flow rate})(1 + \text{mass fuel/air ratio}) / (\text{density of exhaust})$$

- (1) If you do not know the instantaneous density of the exhaust, use the minimum density of the exhaust that occurs over the course of the test, corrected to standard conditions.
- (2) For gasoline-fueled engines designed to be operated at stoichiometric fuel/air ratios, you may assume that the density of the exhaust is 1202 g/m³ at standard conditions of 20°C and 101.3 kPa.
- (3) For LPG-fueled engines designed to be operated at stoichiometric fuel/air ratios, you may assume that the density of the exhaust is 1175 g/m³ at standard conditions of 20°C and 101.3 kPa.
- (4) For CNG-fueled engines designed to be operated at stoichiometric fuel/air ratios, you may assume that the density of the exhaust is 1149 g/m³ at standard conditions of 20°C and 101.3 kPa.
- (d) Calculate instantaneous emission rates (g/hr) using the following general equation:

$$\text{emission rate} = (\text{exhaust volumetric flow rate})(\text{ppm})(\text{density factor}) / 10^6$$

Where:

density factors are 576.8 g/m³ for THC, 1913 g/m³ for NO_x, 1164 g/m³ for CO.

- (e) Integrate instantaneous emission rates for the entire specified sample period.
- (f) Determine instantaneous brake torque and speed.
- (g) Calculate instantaneous brake power.
- (h) Integrate instantaneous brake power for the entire specified sample period.
- (i) Divide the integrated emission rates by the integrated brake power. These are your final brake-specific emission rates.

§1065.930 Specifications for mass air flow sensors.

- (a) Measure the intake air flow using the engine's mass air flow sensor. If the engine is not equipped with a mass air flow sensor, you need to install one.
- (b) The sensor design must have an accuracy and precision of ±5 percent under steady-state laboratory conditions.

- (c) The sensor must reach at least 90 percent of its final response within 0.3 seconds after any step change to the flow rate greater than or equal 80 percent of full scale.
- (d) Calibrate the sensor according to good engineering practice. Verify for each engine before testing that the sensor accurately reads the idle intake air flow rate based on measured manifold temperature (T_M) and pressure (P_M). Use the following equation:

$$\text{Intake air flow} = (\text{displacement})(\text{rpm})(\text{volumetric efficiency})(P_M / 101.3 \text{ kPa})(293.15 \text{ K} / T_M)$$

§1065.935 Specifications for THC analyzers.

- (a) Use a flame ionization detector (FID).
- (b) The analyzer must have an accuracy and precision of ± 2 percent of point or better under steady-state laboratory conditions.
- (c) The analyzer must reach at least 90 percent of its final response within 1.0 second after any step change to the input concentration greater than or equal 80 percent of full scale.
- (d) Zero and span the analyzer daily during testing. Calibrate it according to the analyzer manufacturer's specifications.

§1065.940 Specifications for NO_x and air/fuel sensors.

- (a) Use stabilized zirconia-based sensors.
- (b) The sensors must have an accuracy and precision of ± 2 percent of point or better under steady-state laboratory conditions.
- (c) The sensors must reach at least 90 percent of its final response within 1.0 second after any step change to the input concentration greater than or equal 80 percent of full scale.
- (d) The sensors must be zeroed and spanned daily during testing, and must be calibrated according to the sensor manufacturer's specifications.

§1065.945 Specifications for CO analyzers.

- (a) Use a non-dispersive infrared (NDIR) detector that is compensated for CO₂ and water interference.
- (b) The analyzer must have an accuracy and precision of ± 2 percent of point or better under steady-state laboratory conditions.
- (c) The analyzer must reach at least 90 percent of its final response within 5.0 second after any step change to the input concentration greater than or equal 80 percent of full scale.
- (d) The analyzer must be zeroed and spanned daily during testing, and must be calibrated according to the analyzer manufacturer's specifications.

§1065.950 Specifications for speed and torque measurement.

- (a) Determine torque from a previously determined relationship of torque and engine speed, throttle position, and/or manifold absolute pressure. Torque estimates must be between 85 percent and 105 percent of the true value. You can demonstrate compliance with this accuracy requirement using steady-state laboratory data.
- (b) Measure speed from the engine's electronic control module. Speed estimates must be within ± 5 rpm of the true value.

Subpart K—Definitions and Other Reference Information

§1065.1001 Definitions.

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Act gives to them. The definitions follow:

Accuracy means the maximum difference between a measured or calculated value and the true value, where the true value is determined by NIST.

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 that someone can adjust (including those which are difficult to access) and that, if adjusted, may affect emissions or engine performance during emission testing or normal in-use operation.

Aftertreatment means relating to any system, component, or technology mounted downstream of the exhaust valve or exhaust port whose design function is to reduce exhaust emissions.

Auxiliary emission-control device means any element of design that senses temperature, engine speed, motive speed, transmission gear, atmospheric pressure, manifold pressure or vacuum, or any other parameter to activate, modulate, delay, or deactivate the operation of any part of the emission-control system. This also includes any other feature that causes in-use emissions to be higher than those measured under test conditions, except as we allow under this part.

Brake power has the meaning given in the standard-setting part. If it is not defined in the standard-setting part, brake power means the usable power output of the engine not including power required to operate fuel pumps, oil pumps, or coolant pumps.

Calibration means the set of specifications and tolerances specific to a particular design, version, or application of a component or assembly capable of functionally describing its operation over its working range.

Certification means obtaining a certificate of conformity for an engine family that complies with the emission standards and requirements in this part.

Compression-ignition means relating to a type of reciprocating, internal-combustion engine that is not a spark-ignition engine.

Constant-speed engine means an engine governed to operate only at its rated speed.

Designated Officer means the Manager, Engine Programs Group (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

Emission-control system means any device, system, or element of design that controls or reduces the regulated emissions from an engine.

Emission-data engine means an engine that is tested for certification.

Emission-related maintenance means maintenance that substantially affects emissions or is likely to substantially affect emissions deterioration.

Engine means an engine to which this part applies.

Engine-based means having emission standards related to measurements using an engine dynamometer, in units of grams of pollutant per kilowatt-hour.

Engine family means a group of engines with similar emission characteristics, as specified in the standard-setting part.

Equipment-based or vehicle-based means relating to programs that require that the a piece of equipment of

vehicle be certified, rather than only the engine.

Fuel system means all components involved in transporting, metering, and mixing the fuel from the fuel tank to the combustion chamber(s), including the fuel tank, fuel tank cap, fuel pump, fuel filters, fuel lines, carburetor or fuel-injection components, and all fuel-system vents.

Fuel type means a general category of fuels such as gasoline or LPG. There can be multiple grades within a single type of fuel, such as summer-grade gasoline and winter-grade gasoline.

Good engineering judgment has the meaning we give it in §1068.5 of this chapter.

Identification number means a unique specification (for example, model number/serial number combination) that allows someone to distinguish a particular engine from other similar engines.

Idle speed means the lowest engine speed with zero load. [Note: warm idle speed is the idle speed of a warmed-up engine.]

Manufacturer has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures an engine for sale in the United States or otherwise introduces a new engine into commerce in the United States. This includes importers that import engines for resale.

Maximum test torque means:

- (1) For throttled engines, the torque output observed at wide-open throttle at a given speed.
- (2) For non-throttled engines, the torque output observed with the maximum fueling rate possible at a given speed.

Nonmethane hydrocarbons means the sum of all hydrocarbon species measured by a FID except methane, expressed with an assumed mass 13.876 grams per mole of carbon atoms.

Nonroad means relating to nonroad engines.

Nonroad engine has the meaning given in §89.2 of this chapter. In general this means all internal combustion engines except motor vehicle engines, stationary engines, or engines used solely for competition.

Oxides of nitrogen means the following compounds containing only nitrogen and oxygen. Oxides of nitrogen are expressed quantitatively as if the NO is in the form of NO₂ (assume a molecular weight for all oxides of nitrogen equivalent to that of NO₂). This correction is included in the equations specified for calculating NOx emissions.

Oxygenated fuel means a fuel that is comprised of oxygen-containing compound, such as ethanol or methanol. Generally, testing engines that use oxygenated fuels requires the use of the sampling methods in subpart I of this part. However, you should read the standard-setting part and subpart I of this part to determine which sampling methods to use.

Precision means two times the coefficient of variance of multiple measurements, except where specified otherwise.

Revoking a certificate of conformity means discontinuing the certificate for an engine family. If we revoke a certificate, you must apply for a new certificate before continuing to introduce into commerce the affected engines. This does not apply to engines you no longer possess.

Scheduled maintenance means maintenance (i.e., adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems) that is periodically needed to keep a part from failing or malfunctioning. It also may mean actions you expect are necessary to correct an overt indication of failure or malfunction for which periodic maintenance is not appropriate.

Span means to adjust an instrument so that it gives a proper response to a calibration standard that represents between 75 and 100 percent of the maximum value in the instrument range (e.g. a span gas).

Spark-ignition means relating to a gasoline-fueled engine or other engines with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

Standard-setting part means the part in the Code of Federal Regulations that defines emission standards for a particular engine (see §1065.1(a)).

Stoichiometry means the proportion of a mixture of air and fuel such that the fuel is fully oxidized with no remaining oxygen. For example, stoichiometric combustion in gasoline engines typically occurs at an air-fuel mass ratio of about 14.7.

Suspending a certificate of conformity means temporarily discontinuing the certificate for an engine family. If we suspend a certificate, you may not sell engines from that engine family unless we reinstate the certificate or approve a new one.

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.

Total Hydrocarbon (THC) means the sum of all hydrocarbon species measured by a FID, expressed with an assumed mass 13.876 grams per mole of carbon atoms.

Total Hydrocarbon Equivalent means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, alcohols and aldehydes, or other organic compounds that are measured separately as contained in a gas sample, expressed as petroleum-fueled engine hydrocarbons. The hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

Wide-open throttle means maximum throttle opening for throttled engines. Unless this is specified at a given speed, it refers to maximum throttle opening at maximum speed. For electronically controlled or other engines with multiple possible fueling rates, wide-open throttle also means the maximum fueling rate at maximum throttle opening under test conditions.

Zero means to adjust an instrument so that it gives a proper response to a blank calibration standard (e.g. zero-grade air).

§1065.1005 Symbols, acronyms, and abbreviations.

The following symbols, acronyms, and abbreviations apply to this part:

°	degrees.
"	inches.
ASTM	American Society for Testing and Materials.
C	Celsius.
cc	cubic centimeters.
CFR	Code of Federal Regulations.
CFV	critical-flow venturi.
CI	compression-ignition.
CLD	chemiluminescent detector.
CO	carbon monoxide.
CO ₂	carbon dioxide.
CVS	constant-volume sampler.
DF	deterioration factor.
F	Fahrenheit.
EFC	electronic flow control.
EPA	Environmental Protection Agency.
ft	feet.
FID	flame ionization detector.
g/kW-hr	grams per kilowatt-hour.
g/liter	grams per liter.
g/m ³	grams per cubic meter.
Hz	hertz.
IBP	initial boiling point.
ISO	International Organization for Standardization.
kPa	kilopascal.
lbs.	pounds.
LPG	liquefied petroleum gas.
m	meters.
ml	milliliters.
mm Hg	millimeters of mercury.
NDIR	nondispersive infrared.
NIST	National Institute for Standards and Testing.
NMHC	nonmethane hydrocarbons.
NMHCE	nonmethane hydrocarbon equivalent.
NO	nitric oxide.
NO ₂	nitrogen dioxide.
NO _x	oxides of nitrogen (NO and NO ₂).
O ₂	oxygen.
PDP	positive-displacement pump.
ppm	parts per million.
ppmC	parts per million carbon.
RMS	root-mean square
rpm	revolutions per minute.
sec	seconds.
SI	spark-ignition.
THC	total hydrocarbon.
THCE	total hydrocarbon equivalent.
U.S.C.	United States Code.

§1065.1010 Reference materials.

We have incorporated by reference the documents listed in this section. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, OAR, Air and Radiation Docket and Information Center, 401 M Street, SW, Washington, DC 20460 or the Office of the Federal Register, 800 N. Capitol St., NW, 7th Floor, Suite 700, Washington, DC.

(a) ASTM material. Table 1 of §1065.1010 lists material from the American Society for Testing and Materials that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428. Table 1 follows:

Table 1 of §1065.1010—
ASTM Materials

Document number and name	Part 1065 reference
ASTM D 86-01, Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure.	1065.210
ASTM D 323-99a, Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method).	1065.210
ASTM D 1266-98, Standard Test Method for Sulfur in Petroleum Products (Lamp Method).	1065.210
ASTM D 1319-02, Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption.	1065.210
ASTM D 3231-02, Standard Test Method for Phosphorus in Gasoline.	1065.210
ASTM D 3237-97, Standard Test Method for Lead in Gasoline By Atomic Absorption Spectroscopy.	1065.210
ASTM D 1945-96 (Reapproved 2001), Standard Test Method for Analysis of Natural Gas by Gas Chromatography.	1065.215
ASTM D 1267-02, Standard Test Method for Gage Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas Method).	1065.220
ASTM D 1837-02, Standard Test Method for Volatility of Liquefied Petroleum (LP) Gases.	1065.220
ASTM D 1838-91 (Reapproved 2001), Standard Test Method for Copper Strip Corrosion by Liquefied Petroleum (LP) Gases.	1065.220
ASTM D 2158-02, Standard Test Method for Residues in Liquefied Petroleum (LP) Gases.	1065.220
ASTM D 2163-91 (Reapproved 1996), Standard Test Method for Analysis of Liquefied Petroleum (LP) Gases and Propene Concentrates by Gas Chromatography.	1065.220
ASTM D 2598-02, Standard Practice for Calculation of Certain Physical Properties of Liquefied Petroleum (LP) Gases from Compositional Analysis.	1065.220
ASTM D 2713-91 (Reapproved 2001), Standard Test Method for Dryness of Propane (Valve Freeze Method).	1065.220
ASTM D 2784-98, Standard Test Method for Sulfur in Liquefied Petroleum Gases (Oxy-Hydrogen Burner or Lamp).	1065.220

(b) ISO material. Table 2 of §1065.1010 lists material from the International Organization for Standardization that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the section of this part where we reference it. Anyone may purchase copies of these materials from the International Organization for Standardization, Case Postale 56, CH-1211 Geneva 20, Switzerland. Table 2 follows:

Table 2 of §1065.1010—
ISO Materials

Document number and name	Part 1065 reference
ISO 8178-1, Reciprocating internal combustion engines—Exhaust emission measurement—Part 1: Test-bed measurement of gaseous and particulate exhaust emissions, 1996.	1065.130
	1065.135
	1065.140

§1065.1015 Confidential information.

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method.

We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2.

(b) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.

(c) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in §2.204 of this chapter.

PART 1068— GENERAL COMPLIANCE PROVISIONS FOR NONROAD PROGRAMS

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Appendix I to Part 1068—Emission-Related Components

Appendix II to Part 1068—Emission-Related Parameters and Specifications

Authority: 42 U.S.C. 7401 - 7671(q).

Subpart A—Applicability and Miscellaneous Provisions

§1068.1 Does this part apply to me?

- (a) The provisions of this part apply to everyone with respect to the following engines or to equipment using the following engines (including owners, operators, parts manufacturers, and persons performing maintenance):
- (1) Large nonroad spark-ignition engines we regulate under 40 CFR part 1048.
 - (2) Recreational SI engines and vehicles that we regulate under 40 CFR part 1051 (such as snowmobiles and off-highway motorcycles).
- (b) This part does not apply to any of the following engine or vehicle categories:
- (1) Light-duty motor vehicles (see 40 CFR part 86).
 - (2) Heavy-duty motor vehicles and motor vehicle engines (see 40 CFR part 86).
 - (3) Aircraft engines (see 40 CFR part 87).
 - (4) Locomotive engines (see 40 CFR part 92).
 - (5) Land-based nonroad diesel engines (see 40 CFR part 89).
 - (6) Marine diesel engines (see 40 CFR parts 89 and 94)
 - (7) Marine outboard and personal watercraft engines (see 40 CFR part 91).
 - (8) Small nonroad spark-ignition engines (see 40 CFR part 90).
- (c) For equipment subject to this part and regulated under equipment-based standards, interpret the term “engine” in this part to include equipment (see §1068.30).
- (d) Paragraph (a)(1) of this section identifies the parts of the CFR that define emission standards and other requirements for particular types of engines and vehicles. This part 1068 refers to each these other parts generically as the “standard-setting part.” For example, 40 CFR part 1051 is always the standard-setting part for snowmobiles. Follow the provisions of the standard-setting part if they are different than any of the provisions in this part.

§1068.5 How must manufacturers apply good engineering judgment?

- (a) You must use good engineering judgment for decisions related to any requirements under this chapter. This includes your applications for certification, any testing you do to show that your production-line or in-use engines comply with requirements that apply to them, and how you select, categorize, determine, and apply these requirements.
- (b) If we send you a written request, you must give us a written description of the engineering judgment in question. Respond within 15 working days of receiving our request unless we allow more time.
- (c) We may reject your decision if it is not based on good engineering judgment or is otherwise inconsistent with the requirements that apply, based on the following provisions:
- (1) We may suspend, revoke, or void a certificate of conformity if we determine you deliberately used incorrect information or overlooked important information, that you did not decide in good faith, or that your decision was not rational.
 - (2) If we believe a different decision would better reflect good engineering judgment, but none of the provisions of paragraph (c)(1) of this section apply, we will tell you of our concern (and its basis). You will have 30 days to respond to our concerns, or more time if we agree that you need it to generate more

information. After considering your information, we will give you a final ruling. If we conclude that you did not use good engineering judgment, we may reject your decision and apply the new ruling to similar situations as soon as possible.

- (d) We will tell you in writing of the conclusions we reach under paragraph (c) of this section and explain our reasons for them.
- (e) If you disagree with our conclusions, you may file a request for a hearing with the Designated Officer as described in subpart F of this part. In your request, specify your objections, include data or supporting analysis, and get your authorized representative's signature. If we agree that your request raises a substantial factual issue, we will hold the hearing according to subpart F of this part.

§1068.10 How do I request EPA to keep my information confidential

- (a) Clearly identify any information you consider confidential by marking, circling, bracketing, stamping, or some other method. We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2. This procedure applies equally to the Environmental Appeals Board.
- (b) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.
- (c) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in §2.204 of this chapter.

§1068.15 Who is authorized to represent the Agency?

- (a) The Administrator of the Environmental Protection Agency or any official to whom the Administrator has delegated specific authority may represent the Agency. For more information, ask for a copy of the relevant sections of the EPA Delegation Manual from the Designated Officer.
- (b) The regulations in this part and in the standard-setting part have specific requirements describing how to get EPA approval before you take specific actions. These regulations also allow us to waive some specific requirements. For provisions or flexibilities that we address frequently, we may choose to provide detailed guidance in supplemental compliance instructions for manufacturers. Such instructions will generally state how they relate to the need for pre-approval. Unless we explicitly state so, you should not consider full compliance with the instructions to be equivalent to EPA approval.

§1068.20 May EPA enter my facilities for inspections?

- (a) We may inspect your engines, testing, manufacturing processes, engine storage facilities (including port facilities for imported engines or other relevant facilities), or records, as authorized by the Act, to enforce the provisions of this chapter. Inspectors will have authorizing credentials and will limit inspections to reasonable times—usually, normal operating hours.
- (b) If we come to inspect, we may or may not have a warrant or court order.
 - (1) If we do not have a warrant or court order, you may deny us entry.
 - (2) If we have a warrant or court order, you must allow us to enter the facility and carry out the activities it describes.
- (c) We may seek a warrant or court order authorizing an inspection described in this section, whether or not we first tried to get your permission to inspect.
- (d) We may select any facility to do any of the following:

- (1) Inspect and monitor any aspect of engine manufacturing, assembly, storage, or other procedures, and any facilities where you do them.
 - (2) Inspect and monitor any aspect of engine test procedures or test-related activities, including test engine selection, preparation, service accumulation, emission duty cycles, and maintenance and verification of your test equipment's calibration.
 - (3) Inspect and copy records or documents related to assembling, storing, selecting, and testing an engine.
 - (4) Inspect and photograph any part or aspect of engines and components you use for assembly.
- (e) You must give us reasonable help without charge during an inspection authorized by the Act. For example, you may need to help us arrange an inspection with the facility's managers, including clerical support, copying, and translation. You may also need to show us how the facility operates and answer other questions. If we ask in writing to see a particular employee at the inspection, you must ensure that he or she is present (legal counsel may accompany the employee).
- (f) If you have facilities in other countries, we expect you to locate them in places where local law does not keep us from inspecting as described in this section. We will not try to inspect if we learn that local law prohibits it, but we may suspend your certificate if we are not allowed to inspect.

§1068.25 What information must I give to EPA?

If you are subject to the requirements of this part, we may require you to give us information to evaluate your compliance with any regulations that apply, as authorized by the Act. This includes the following things:

- (a) You must provide the information we require in this chapter.
- (b) You must establish and maintain records, perform tests, make reports and provide additional information that we may reasonably require under section 208 of the Act. This also applies to engines we exempt from emission standards.

§1068.30 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Act gives to them. The definitions follow:

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

Aircraft means any vehicle capable of sustained air travel above treetop heights.

Certificate holder means a manufacturer (including importers) with a valid certificate of conformity for at least one engine family in a given calendar year.

Designated Officer means the Manager of the Engine Programs Group (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

Emission-related defect means a defect in design, materials or workmanship (in an emission control device or vehicle component or system) that affects an emission-related component, parameter, or specification that is identified in Appendix I or Appendix II of this part.

Engine means an engine to which this part applies. For equipment subject to this part and regulated under equipment-based standards, the term engine in this part shall be interpreted to include equipment.

Engine-based means having emission standards related to measurements using an engine dynamometer, in units of grams of pollutant per kilowatt-hour.

Engine manufacturer means the manufacturer that is subject to the certification requirements of the standard-setting part. For vehicles/equipment subject to this part and regulated under vehicle/equipment-based

standards, the term engine manufacturer in this part includes vehicles/equipment manufacturers.

Equipment-based means having emission standards related to measurements from an engine installed in a vehicle using a chassis dynamometer, in units of grams of pollutant per kilometer.

Equipment manufacturer means any company producing a piece of equipment (such as a vehicle) for sale or use in the United States.

Manufacturer has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures an engine or vehicle for sale in the United States or otherwise introduces a new engine or vehicle into commerce in the United States. This includes importers that import new engines or new equipment into the United States for resale. It also includes secondary engine manufacturers.

New has the meaning we give it in the standard-setting part.

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 (2)(iii) of this definition does not apply to an engine after the engine is removed from the location.

Operating hours means:

- (1) For engine storage areas or facilities, times during which people other than custodians and security personnel are at work near, and can access, a storage area or facility.
- (2) For other areas or facilities, times during which an assembly line operates or any of the following activities occurs:
 - (i) Testing, maintenance, or service accumulation.
 - (ii) Production or compilation of records.

- (iii) Certification testing.
- (iv) Translation of designs from the test stage to the production stage.
- (v) Engine manufacture or assembly.

Piece of equipment means any vehicle, vessel, locomotive, aircraft, or other type of equipment using engines to which this part applies.

Placed into service means used for its intended purpose.

Reasonable technical basis means information that would lead a person familiar with engine design and function to reasonably believe a conclusion, related to compliance with the requirements of this part. For example, it would be reasonable to believe that parts performing the same function as the original parts (and to the same degree) would control emissions to the same degree as the original parts.

(2) Adjust parameters or change design elements only according to the original engine manufacturer's instructions. Or, if you differ from these instructions, you must have data or some other technical basis to show you should not expect in-use emissions to increase.

Standard-setting part means the part in the Code of Federal Regulations that defines emission standards for a particular engine (see §1068.1(a)). For example, the standard-setting part for non-recreational spark-ignition engines over 19 kW is part 1048 of this chapter.

Ultimate purchaser means the first person who in good faith buys a new engine for purposes other than resale.

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

§1068.30 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part:

\$	U.S. dollars.
CFR	Code of Federal Regulations.
EPA	Environmental Protection Agency.
U.S.	United States.
U.S.C.	United States Code.

Subpart B—Prohibited Actions and Related Requirements

§1068.101 What general actions does this regulation prohibit?

This section specifies actions that are prohibited and the maximum civil penalties that we can assess for each violation. The maximum penalty values listed in paragraphs (a) and (b) of this section are shown for calendar year 2002. As described in paragraph (e) of this section, maximum penalty limits for later years are set forth in 40 CFR part 19.

(a) The following prohibitions and requirements apply to manufacturers of new engines and manufacturers of equipment containing these engines, except as described in subparts C and D of this part:

(1) You may not sell, offer for sale, or introduce or deliver into commerce in the United States or import into the United States any new engine or equipment after emission standards take effect for that engine or equipment, unless it has a valid certificate of conformity for its model year and the required label or tag. You also may not take any of the actions listed in the previous sentence with respect to any equipment containing an engine subject to this part's provisions, unless the engine has a valid certificate of conformity for its model year and the required engine label or tag. This requirement also covers new engines you produce to replace an older engine in a piece of equipment, unless the engine qualifies for the replacement-engine exemption in §1068.240. We may assess a civil penalty up to \$31,500 for each engine in violation.

(2) This chapter requires you to record certain types of information to show that you meet our standards. You must comply with these requirements to make and maintain required records (including those described in §1068.501). You may not deny us access to or copying of your records if we have the authority to see or copy them. Also, you must give us the required reports or information without delay. Failure to comply with the requirements of this paragraph is prohibited. We may assess a civil penalty up to \$31,500 for each day in violation.

(3) You may not keep us from entering your facility to test engines or inspect if we are authorized to do so. Also, you must perform the tests we require (or have the tests done for you). Failure to perform this testing is prohibited. We may assess a civil penalty up to \$31,500 for each day in violation.

(b) The following prohibitions apply to everyone with respect to the engines to which this part applies:

(1) You may not remove or disable a device or element of design that may affect an engine's emission levels. This restriction applies before and after the engine is placed in service. Section 1068.120 describes how this applies to rebuilding engines. For a manufacturer or dealer, we may assess a civil penalty up to \$31,500 for each engine in violation. For anyone else, we may assess a civil penalty up to \$3,150 for each engine in violation. This does not apply in any of the following situations:

(i) You need to repair an engine and you restore it to proper functioning when the repair is complete.

(ii) You need to modify an engine to respond to a temporary emergency and you restore it to proper functioning as soon as possible.

(iii) You modify a new engine that another manufacturer has already certified to meet emission standards, intending to recertify it under your own engine family. In this case you must tell the original manufacturer not to include the modified engines in the original engine family.

(2) You may not knowingly manufacture, sell, offer to sell, or install, an engine part if one of its main

effects is to bypass, impair, defeat, or disable the engine's control of emissions. We may assess a civil penalty up to \$3,150 for each part in violation.

(3) For an engine that is excluded from any requirements of this chapter because it is a stationary engine, you may not move it or install it in any mobile equipment, except as allowed by the provisions of this chapter. You may not circumvent or attempt to circumvent the residence-time requirements of paragraph (2)(iii) of the nonroad engine definition in §1068.30. We may assess a civil penalty up to \$31,500 for each day in violation.

(4) For an uncertified engine or piece of equipment that is excluded or exempted from any requirements of this chapter because it is to be used solely for competition, you may not use it in a manner that is inconsistent with use solely for competition. We may assess a civil penalty up to \$31,500 for each day in violation.

(5) You may not import an uncertified engine or piece of equipment if it is defined to be new in the standard-setting part, and it would have been subject to standards had it been built in the United States. We may assess a civil penalty up to \$31,500 for each day in violation. Note the following:

(i) The definition of new is broad for imported engines; uncertified engines and equipment (including used engines and equipment) are generally considered to be new when imported.

(ii) Engines that were originally manufactured before applicable EPA standards were in effect are generally not subject to emission standards.

(c) Exemptions from these prohibitions are described in subparts C and D of this part.

(d) The standard-setting parts describe more requirements and prohibitions that apply to manufacturers (including importers) and others under this chapter.

(e) The maximum penalty values listed in paragraphs (a) and (b) of this section are shown for calendar year 2002. Maximum penalty limits for later years may be adjusted based on the Consumer Price Index. The specific regulatory provisions for changing the maximum penalties, published in 40 CFR part 19, reference the applicable U.S. Code citation on which the prohibited action is based. The following table is shown here for informational purposes:

Table 1 of §1068.101—Legal Citation for Specific
Prohibitions for Determining Maximum Penalty Amounts

Part 1068 Regulatory Citation of Prohibited Action	General Description of Prohibition	U.S. Code Citation for Clean Air Act Authority
§1068.101 (a) (1)	Introduction into commerce of an uncertified product.	42 U.S.C. 7522(a)(1)
§1068.101 (a)(2)	Failure to provide information.	42 U.S.C. 7522(a)(2)
§1068.101 (a)(3)	Denying access to facilities.	42 U.S.C. 7522(a)(2)
§1068.101 (b)(1)	Tampering with emission controls by a manufacturer or dealer. Tampering with emission controls by someone other than a manufacturer or dealer.	42 U.S.C. 7522(a)(3)
§1068.101 (b)(2)	Sale or use of a defeat device.	42 U.S.C. 7522(a)(3)
§1068.101 (b)(3)	Mobile use of a stationary engine.	42 U.S.C. 7522(a)(1)
§1068.101 (b)(4)	Noncompetitive use of an uncertified engine that is exempted for competition.	42 U.S.C. 7522(a)(1)
§1068.101 (b) (5)	Importation of an uncertified product.	42 U.S.C. 7522(a)(1)

§1068.105 What other provisions apply to me specifically if I manufacture equipment needing certified engines?

(a) Transitioning to new standards. You may use up your normal inventory of engines not certified to new emission standards if they were built before the date of the new standards. However, stockpiling these engines violates §1068.101(a)(1).

(b) Installing engines. You must follow the engine manufacturer’s emission-related installation instructions. For example, you may need to constrain where you place an exhaust aftertreatment device or integrate into your equipment models a device for sending visual or audible signals to the operator. Not meeting the manufacturer’s emission-related installation instructions is a violation of §1068.101(b)(1).

(c) Attaching a duplicate label. If you obscure the engine’s label, you must do three things to avoid violating §1068.101(a)(1):

- (1) Permanently attach to your equipment a duplicate label. Secure it to a part needed for normal operation and not normally requiring replacement.
- (2) Make sure your label is identical to the engine label. You may make the label yourself or get it from the engine manufacturer.
- (3) Make sure an average person can easily read it.

(d) Producing nonroad equipment certified to highway emission standards. You may produce nonroad equipment from complete or incomplete motor vehicles with the motor vehicle engine if you meet three criteria:

- (1) The engine or vehicle is certified to 40 CFR part 86.
- (2) The engine is not adjusted outside the manufacturer's specifications.
- (3) The engine or vehicle is not modified in any way that may affect its emission control. This applies to evaporative emission controls, but not refueling emission controls.

§1068.110 What other provisions apply to engines in service?

- (a) Aftermarket parts and service. As the engine manufacturer, you may not require anyone to use your parts or service to maintain or repair an engine, unless we approve this in your application for certification. It is a violation of the Act for anyone to manufacture an engine or vehicle part if one of its main effects is to reduce the effectiveness of the emission controls. See §1068.101(b)(2).
- (b) Certifying aftermarket parts. As the manufacturer or rebuilder of an aftermarket engine part, you may—but are not required to—certify according to §85.2114 of this chapter that using the part will not cause engines to fail to meet emission standards. Whether you certify or not, however, you must keep any information showing how your parts or service affect emissions.
- (c) Compliance with standards. We may test engines or equipment to investigate compliance with emission standards. We may also require the manufacturer to do this testing.
- (d) Defeat devices. We may test engines or equipment to investigate potential defeat devices. We may also require the manufacturer to do this testing. If we choose to investigate one of your designs, we may require you to show us that it does not have a defeat device. To do this, you may have to share with us information regarding test programs, engineering evaluations, design specifications, calibrations, on-board computer algorithms, and design strategies. It is a violation of the Act for anyone to make, install or use defeat devices. See §1068.101(b)(2) and the standard-setting part.
- (e) Warranty and maintenance. Owners may make warranty claims against the manufacturer for emission-related parts, as described in §1068.115. This generally includes any emission-related engine parts that were not in common use before we have adopted emission standards. In general, we consider replacement or repair of any other components to be the owner's responsibility. The warranty period begins when the engine is first placed into service. See the standard-setting part for specific requirements. It is a violation of the Act for anyone to disable emission controls. See §1068.101(b)(1) and the standard-setting part.

§1068.115 When must manufacturers honor emission-related warranty claims?

Section 207(a) of the Clean Air Act (42 U.S.C. 7541(a)) requires certifying manufacturers to warrant to purchasers that their engines are designed, built, and equipped to conform at the time of sale to the applicable regulations for their full useful life, including a warranty that the engines are free from defects in materials and workmanship that would cause an engine to fail to conform to the applicable regulations during the specified warranty period. This section codifies the warranty requirements of section 207(a) without intending to limit these requirements.

- (a) As a certifying manufacturer, you may deny warranty claims for failures that have been caused by the owner's or operator's improper maintenance or use. For example, you would not need to honor warranty claims for failures that have been directly caused by the operator's abuse of an engine or the operator's use of the engine in a manner for which it was not designed, and are not attributable to you in any way.
- (b) As a certifying manufacturer, you may not deny emission-related warranty claims based on any of the following:
 - (1) Maintenance or other service you or your authorized facilities performed.
 - (2) Engine repair work that an operator performed to correct an unsafe, emergency condition attributable to

you, as long as the operator tries to restore the engine to its proper configuration as soon as possible.

(3) Any action or inaction by the operator unrelated to the warranty claim.

(4) Maintenance that was performed more frequently than you specify.

(5) Anything that is your fault or responsibility.

(6) The use of any fuel that is commonly available where the engine operates, unless your written maintenance instructions state that this fuel would harm the engine's emission control system and operators can readily find the proper fuel.

§1068.120 What requirements must I follow to rebuild engines?

(a) This section describes the steps to take when rebuilding engines to avoid violating the tampering prohibition in §1068.101(b)(1). These requirements apply to anyone rebuilding an engine subject to this part, but the recordkeeping requirements in paragraphs (j) and (k) of this section apply only to businesses.

(b) The term "rebuilding" refers to a rebuild of an engine or engine system, including a major overhaul in which you replace the engine's pistons or power assemblies or make other changes that significantly increase the service life of the engine. It also includes replacing or rebuilding an engine's turbocharger or aftercooler or the engine's systems for fuel metering or electronic control so that it significantly increases the service life of the engine. For these provisions, rebuilding may or may not involve removing the engine from the equipment. Rebuilding does not normally include the following:

(1) Scheduled emission-related maintenance that the standard-setting part allows during the useful life period (such as replacing fuel injectors).

(2) Unscheduled maintenance that occurs commonly within the useful life period. For example, replacing a water pump is not rebuilding.

(c) For maintenance or service that is not rebuilding, you may not make changes that might increase emissions, but you do not need to keep any records.

(d) If you rebuild an engine or engine system, you must have a reasonable technical basis for knowing that the rebuilt engine has the same emissions performance as the engine in its certified configuration. Identify the model year of the resulting engine configuration. You have a reasonable basis if you meet two main conditions:

(1) Install parts— new, used, or rebuilt— so a person familiar with engine design and function would reasonably believe that the engine with those parts will control emissions to the same degree as with the original parts. For example, it would be reasonable to believe that parts performing the same function as the original parts (and to the same degree) would control emissions to the same degree as the original parts.

(2) Adjust parameters or change design elements only according to the original engine manufacturer's instructions. Or, if you differ from these instructions, you must have data or some other technical basis to show you should not expect in-use emissions to increase.

(e) If the rebuilt engine remains installed or is reinstalled in the same piece of equipment, you must rebuild it to the original configuration or another certified configuration of the same or later model year.

(f) If the rebuilt engine replaces another engine in a piece of equipment, you must rebuild it to a certified configuration that equals the emissions performance of the engine you are replacing.

(g) Do not erase or reset emission-related codes or signals from onboard monitoring systems without diagnosing and responding appropriately to any diagnostic codes. This requirement applies regardless of the manufacturer's reason for installing the monitoring system and regardless of its form or interface. Clear any codes from diagnostic systems when you return the rebuilt engine to service. Do not disable a diagnostic signal without addressing its

cause.

(h) When you rebuild an engine, check, clean, adjust, repair, or replace all emission-related components (listed in Appendix I of this part) as needed according to the original manufacturer's recommended practice. In particular, replace oxygen sensors, replace the catalyst if there is evidence of malfunction, clean gaseous fuel system components, and replace fuel injectors (if applicable), unless you have a reasonable technical basis for believing they do not need replacement.

(i) If you are installing an engine that someone else has rebuilt, check all emission-related components listed in Appendix I of this part as needed according to the original manufacturer's recommended practice.

(j) Keep at least the following records:

- (1) Identify the hours of operation (or mileage, as appropriate) at time of rebuild.
- (2) Identify the work done on the engine or any emission-related control components, including a listing of parts and components you used.
- (3) Describe any engine parameter adjustments.
- (4) Identify any emission-related codes or signals you responded to and reset.

(k) You must show us or send us your records if we ask for them. Keep records for at least two years after rebuilding an engine. Keep them in any format that allows us to readily review them.

- (1) You do not need to keep information that is not reasonably available through normal business practices. We do not expect you to have information that you cannot reasonably access.
- (2) You do not need to keep records of what other companies do.
- (3) You may keep records based on engine families rather than individual engines if that is the way you normally do business.

§1068.125 What happens if I violate the regulations?

(a) Civil penalties and injunctions. We may bring a civil action to assess and recover civil penalties and/or enjoin and restrain violations in the United States District Court for the district where you allegedly violated a requirement, or the district where you live or have your main place of business. Actions to assess civil penalties or restrain violations of §1068.101 must be brought by and in the name of the United States. The selected court has jurisdiction to restrain violations and assess civil penalties.

(1) To determine the amount of a civil penalty and reach a just conclusion, the court considers these main factors:

- (i) The seriousness of your violation.
- (ii) How much you benefitted or saved because of the violation.
- (iii) The size of your business.
- (iv) Your history of compliance with Title II of the Act.
- (v) What you did to remedy the violation.
- (vi) How the penalty will affect your ability to continue in business.
- (vii) Such other matters as justice may require.

(2) Subpoenas for witnesses who must attend a district court in any district may apply to any other district.

(b) Administrative penalties. Instead of bringing a civil action, we may assess administrative penalties if the total is less than \$250,000 against you individually. This maximum penalty may be greater if the Administrator and the Attorney General jointly determine that is appropriate for administrative penalty assessment, or if the limit is adjusted under 40 CFR part 19. No court may review such a determination. Before we assess an administrative

penalty, you may ask for a hearing (subject to 40 CFR part 22). The Administrator may compromise or remit, with or without conditions, any administrative penalty that may be imposed under this section.

(1) To determine the amount of an administrative penalty, we will consider the factors described in paragraph (a)(1) of this section.

(2) An administrative order we issue under this paragraph (b) becomes final 30 days after we issue it, unless you ask for judicial review by that time (see paragraph (c) of this section). You may ask for review by any of the district courts listed in paragraph (a) of this section. Send the Administrator a copy of the filing by certified mail.

(3) We will not pursue an administrative action for a violation if either of the following two conditions is true:

(i) We are separately prosecuting the violation under this part.

(ii) We have issued a final order for a violation, no longer subject to judicial review, for which you have already paid a penalty.

(c) Judicial review. If you ask a court to review a civil or administrative penalty, we will file in the appropriate court within 30 days of your request a certified copy or certified index of the record on which the court or the Administrator issued the order.

(1) The judge may set aside or remand any order issued under this section only if one of the following is true:

(i) Substantial evidence does not exist in the record, taken as a whole, to support finding a violation.

(ii) The Administrator's assessment of the penalty is an abuse of discretion.

(2) The judge may not add civil penalties unless our penalty is an abuse of discretion that favors you.

(d) Effect of enforcement actions on other requirements. Our pursuit of civil or administrative penalties does not affect or limit our authority to enforce any provisions of this chapter.

(e) Penalties. In any proceedings, the United States government may seek to collect civil penalties assessed under this section.

(1) Once a penalty assessment is final, if you do not pay it, the Administrator will ask the Attorney General to bring a civil action in an appropriate district court to recover the money. We may collect interest from the date of the final order or final judgment at rates established by the Internal Revenue Code of 1986 (26 U.S.C. 6621(a)(2)). In this action to collect overdue penalties, the court will not review the validity, amount, and appropriateness of the penalty.

(2) In addition, if you do not pay the full amount of a penalty on time, you must then pay more to cover interest, enforcement expenses (including attorney's fees and costs for collection), and a quarterly nonpayment penalty for each quarter you do not pay. The nonpayment penalty is 10 percent of your total penalties plus any unpaid nonpayment penalties from previous quarters.

Subpart C— Exemptions and Exclusions

§1068.201 Does EPA exempt or exclude any engines from the prohibited acts?

We may exempt new engines from the prohibited acts in subpart B of this part under requirements described in this subpart. We may exempt an engine already placed in service in the United States from the prohibition in §1068.101(b)(1) if the exemption for engines used solely for competition applies (see §1068.235). In addition, see §1068.1 and the standard-setting parts to determine if other engines are excluded from these regulations.

- (a) This subpart identifies which engines qualify for exemptions and what information we need. We may ask for more information.
- (b) If you violate any of the terms, conditions, instructions, or requirements to qualify for an exemption, we may void the exemption.
- (c) If you use an exemption under this subpart, we may require you to add a permanent label to your exempted engines. You may ask us to approve wording on the emission label different than we specify in this subpart if it is more appropriate for your engine.
- (d) If you produce engines we exempt under this subpart, we may require you to make and keep records, perform tests, make reports and provide information as needed to reasonably evaluate the validity of the exemption.
- (e) If you own or operate engines we exempt under this subpart, we may require you to provide information as needed to reasonably evaluate the validity of the exemption.
- (f) Subpart D of this part describes how we apply these exemptions to engines you import (or intend to import).
- (g) If you want to ask for an exemption or need more information, write to the Designated Officer.
- (h) You may ask us to modify the administrative requirements for the exemptions described in this subpart. We may approve your request if we determine that such approval is consistent with the intent of this part. For example, waivable administrative requirements might include some reporting requirements, but would not include any eligibility requirements or use restrictions.
- (i) If you want to take an action with respect to an exempted or excluded engine that is prohibited by the exemption or exclusion, such as selling it, you need to certify the engine. We will issue a certificate of conformity if you send us an application for certification showing that you meet all the applicable requirements from the standard-setting part. Also, in some cases, it may be sufficient to modify the engine as needed to make it identical to engines already covered by a certificate. Make sure these engines have emission control information labels that accurately describe their status.

§1068.210 What are the provisions for exempting test engines?

- (a) We may exempt engines that are not exempted under other sections of this part that you will use for research, investigations, studies, demonstrations, or training.
- (b) Anyone may ask for a testing exemption.
- (c) If you are a certificate holder, you may request an exemption for engines you intend to include in test programs over a two-year period.
 - (1) In your request, tell us the maximum number of engines involved and describe how you will make sure exempted engines are used only for this testing.
 - (2) Give us the information described in paragraph (d) of this section if we ask for it.
- (d) If you are not a certificate holder do all of the following:

- (1) Show that the proposed test program has a valid purpose under paragraph (a) of this section.
- (2) Show you need an exemption to achieve the purpose of the test program (time constraints may be a basis for needing an exemption, but the cost of certification alone is not).
- (3) Estimate the duration of the proposed test program and the number of engines involved.
- (4) Allow us to monitor the testing.
- (5) Describe how you will ensure that you stay within this exemption's purposes. Address at least the following things:
 - (i) The technical nature of the test.
 - (ii) The test site.
 - (iii) The duration and accumulated engine operation associated with the test.
 - (iv) Ownership of the engines involved in the test.
 - (v) The intended final disposition of the engines.
 - (vi) How you will identify, record, and make available the engine identification numbers.
 - (vii) The means or procedure for recording test results.

(e) If we approve your request for a testing exemption, we will send you a letter or a memorandum for your signature describing the basis and scope of the exemption. The exemption does not take effect until we receive the signed letter or memorandum from you. It will also include any necessary terms and conditions, which normally require you to do the following:

- (1) Stay within the scope of the exemption.
- (2) Create and maintain adequate records that we may inspect.
- (3) Add a permanent, legible label, written in block letters in English, to a readily visible part of each exempted engine. This label must include at least the following items:
 - (i) The label heading "EMISSION CONTROL INFORMATION".
 - (ii) Your corporate name and trademark.
 - (iii) Engine displacement, engine family identification (as applicable), and model year of the engine; or whom to contact for further information.
 - (iv) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.210 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS."
- (4) Tell us when the test program is finished.
- (5) Tell us the final disposition of the engines.
- (6) Send us a written confirmation that you meet the terms and conditions of this exemption.

§1068.215 What are the provisions for exempting manufacturer-owned engines?

- (a) You are eligible for the exemption for manufacturer-owned engines only if you are a certificate holder.
- (b) An engine may be exempt without a request if it is a nonconforming engine under your ownership and control and you operate it to develop products, assess production methods, or promote your engines in the marketplace. You may not lease, sell, or use the engine to generate revenue, either by itself or in a piece of equipment.
- (c) To use this exemption, you must do three things:
 - (1) Establish, maintain, and keep adequately organized and indexed information on each exempted engine, including the engine identification number, the use of the engine on exempt status, and the final disposition of any engine removed from exempt status.
 - (2) Let us access these records, as described in §1068.20.

(3) Add a permanent, legible label, written in block letters in English, to a readily visible part of each exempted engine. This label must include at least the following items:

(i) The label heading "EMISSION CONTROL INFORMATION."

(ii) Your corporate name and trademark.

(iii) Engine displacement, engine family identification, and model year of the engine or whom to contact for further information.

(iv) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.215 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.".

§1068.220 What are the provisions for exempting display engines?

(a) Anyone may request an exemption for display engines.

(b) A nonconforming display engine will be exempted if it is used only for displays in the interest of a business or the general public. This exemption does not apply to engines displayed for private use or any other purpose we determine is inappropriate for a display exemption.

(c) You may operate the exempted engine, but only if we approve specific operation that is part of the display.

(d) You may sell or lease the exempted engine only with our advance approval; you may not use it to generate revenue.

(e) To use this exemption, you must add a permanent, legible label, written in block letters in English, to a readily visible part of each exempted engine. This label must include at least the following items:

(1) The label heading "EMISSION CONTROL INFORMATION."

(2) Your corporate name and trademark.

(3) Engine displacement, engine family identification, and model year of the engine or whom to contact for further information.

(4) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.220 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.".

(f) We may set other conditions for approval of this exemption.

§1068.225 What are the provisions for exempting engines for national security?

(a) You are eligible for the exemption for national security only if you are a manufacturer.

(b) Your engine is exempt without a request if you produce it for a piece of equipment owned or used by an agency of the federal government responsible for national defense, where the equipment has armor, permanently attached weaponry, or other substantial features typical of military combat.

(c) You may request a national security exemption for engines not meeting the conditions of paragraph (b) of this section, as long as your request is endorsed by an agency of the federal government responsible for national defense. In your request, explain why you need the exemption.

§1068.230 What are the provisions for exempting engines for export?

(a) If you export a new engine to a country with emission standards identical to ours, we will not exempt it. These engines must comply with our certification requirements.

(b) If you export an engine to a country with different emission standards or no emission standards, it is exempt from the prohibited acts in this part without a request. If you produce an exempt engine for export and it is sold or

offered for sale to someone in the United States (except for export), we will void the exemption.

(c) Label each exempted engine and shipping container with a label or tag showing the engine is not certified for sale or use in the United States. The label must include at least the statement “THIS ENGINE IS SOLELY FOR EXPORT AND IS THEREFORE IS EXEMPT UNDER 40 CFR 1068.230 FROM U.S. EMISSION STANDARDS AND RELATED REQUIREMENTS.”.

§1068.235 What are the provisions for exempting engines used solely for competition?

(a) New engines you produce that are used solely for competition are generally excluded from emission standards. See the standard-setting parts for specific provisions where applicable.

(b) If you modify an engine after it has been placed into service in the United States so it will be used solely for competition, it is exempt without request. This exemption applies only to the prohibition in §1068.101(b)(1) and is valid only as long as the engine is used solely for competition.

(c) If you modify an engine under this exemption, you must destroy the original emission label. If you sell or give one of these engines to someone else, you must tell the new owner in writing that it may be used only for competition.

§1068.240 What are the provisions for exempting new replacement engines?

(a) You are eligible for the exemption for new replacement engines only if you are a certificate holder.

(b) The prohibitions in §1068.101(a)(1) do not apply to an engine if all the following conditions apply:

(1) You produce a new engine to replace an engine already placed in service in a piece of equipment.

(2) The engine being replaced was manufactured before the emission standards that would otherwise apply to the new engine took effect.

(3) No engine certified to current emission requirements is available with the appropriate physical or performance characteristics for the piece of equipment.

(4) You or your agent takes possession of the old engine.

(5) You make the replacement engine in a configuration identical in all material respects to the engine being replaced (or that of another certified engine of the same or later model year). This requirement applies only if the old engine was certified to emission standards less stringent than those in effect when you produce the replacement engine.

(c) If the old engine was not certified to any emission standards under this chapter, clearly label the replacement engine with the following language:

THIS ENGINE DOES NOT COMPLY WITH FEDERAL NONROAD OR HIGHWAY EMISSION REQUIREMENTS. SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN AS A REPLACEMENT ENGINE IN A VEHICLE OR PIECE OF EQUIPMENT BUILT BEFORE JANUARY 1, [Insert appropriate year reflecting when standards began to apply to engines of that size and type] IS A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(d) If the old engine was certified to emission standards less stringent than those in effect when you produce the replacement engine, clearly label the replacement engine with the following language:

THIS ENGINE DOES NOT COMPLY WITH CURRENT FEDERAL NONROAD OR HIGHWAY EMISSION REQUIREMENTS. SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN AS A REPLACEMENT ENGINE IN A VEHICLE OR PIECE

OF EQUIPMENT BUILT BEFORE JANUARY 1, [Insert appropriate year reflecting when the earlier tier of emission standards began to apply to the old engine] IS A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

§1068.245 What temporary provisions address hardship due to unusual circumstances?

- (a) After considering the circumstances, we may permit you to introduce into commerce engines or equipment that do not comply with emission standards if all the following conditions apply:
- (1) Unusual circumstances that are clearly outside your control and that could not have been avoided with reasonable discretion prevent you from meeting requirements from this chapter.
 - (2) You exercised prudent planning and were not able to avoid the violation; you have taken all reasonable steps to minimize the extent of the nonconformity.
 - (3) Not having the exemption will jeopardize the solvency of your company.
 - (4) No other allowances are available under the regulations in this chapter to avoid the impending violation.
- (b) To apply for an exemption, you must send the Designated Officer a written request as soon as possible before you are in violation. In your request, show that you meet all the conditions and requirements in paragraph (a) of this section.
- (c) Include in your request a plan showing how you will meet all the applicable requirements as quickly as possible.
- (d) You must give us other relevant information if we ask for it.
- (e) We may include reasonable additional conditions on an approval granted under this section, including provisions to recover or otherwise address the lost environmental benefit or paying fees to offset any economic gain resulting from the exemption. For example, in the case of multiple tiers of emission standards, we may require that you meet the less stringent standards.
- (f) Add a permanent, legible label, written in block letters in English, to a readily visible part of each engine exempted under this section. This label must include at least the following items:
- (1) The label heading "EMISSION CONTROL INFORMATION."
 - (2) Your corporate name and trademark.
 - (3) Engine displacement (in liters), rated power, and model year of the engine or whom to contact for further information.
 - (4) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.245 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS."

§1068.250 What are the provisions for extending compliance deadlines for small-volume manufacturers under hardship?

- (a) After considering the circumstances, we may extend the compliance deadline for you to meet new or revised emission standards, as long as you meet all the conditions and requirements in this section.
- (b) To be eligible for this exemption, you must qualify under the standard-setting part for special provisions for small businesses or small-volume manufacturers.
- (c) To apply for an extension, you must send the Designated Officer a written request. In your request, show that all the following conditions and requirements apply:
- (1) You have taken all possible business, technical, and economic steps to comply.
 - (i) In the case of importers of engines produced by other companies, show that you attempted to find a manufacturer capable of supplying complying products as soon as you became aware of the

applicable requirements, but were unable to do so.

(ii) For all other manufacturers, show that the burden of compliance costs prevents you from meeting the requirements of this chapter.

(2) Not having the exemption will jeopardize the solvency of your company.

(3) No other allowances are available under the regulations in this chapter to avoid the impending violation.

(d) In describing the steps you have taken to comply under paragraph (c)(1) of this section, include at least the following information:

(1) Describe your business plan, showing the range of projects active or under consideration.

(2) Describe your current and projected financial standing, with and without the burden of complying with regulations.

(3) Describe your efforts to raise capital to comply with regulations (this may not apply for importers).

(4) Identify the engineering and technical steps you have taken or plan to take to comply with regulations.

(5) Identify the level of compliance you can achieve. For example, you may be able to produce engines that meet a somewhat less stringent emission standard than the regulations in this chapter require.

(e) Include in your request a plan showing how you will meet all the applicable requirements as quickly as possible.

(f) You must give us other relevant information if we ask for it.

(g) An authorized representative of your company must sign the request and include the statement: "All the information in this request is true and accurate, to the best of my knowledge."

(h) Send your request for this extension at least nine months before the relevant deadline. If different deadlines apply to companies that are not small-volume manufacturers, do not send your request before the regulations in question apply to the other manufacturers. Otherwise, do not send your request more than three years before the relevant deadline.

(i) We may include reasonable requirements on an approval granted under this section, including provisions to recover or otherwise address the lost environmental benefit. For example, we may require that you meet a less stringent emission standard or buy and use available emission credits.

(j) We will approve extensions of up to one year. We may review and revise an extension as reasonable under the circumstances.

(k) Add a permanent, legible label, written in block letters in English, to a readily visible part of each engine exempted under this section. This label must include at least the following items:

(1) The label heading "EMISSION CONTROL INFORMATION".

(2) Your corporate name and trademark.

(3) Engine displacement (in liters), rated power, and model year of the engine or whom to contact for further information.

(4) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.250 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS."

§1068.255 What are the provisions for exempting engines for hardship for equipment manufacturers and secondary engine manufacturers?

This section describes how, in unusual circumstances, we may exempt certain engines to prevent a hardship to an equipment manufacturer or a secondary engine manufacturer. This section does not apply to products that are subject to vehicle-based emission standards.

(a) Equipment exemption. As an equipment manufacturer, you may ask for approval to produce exempted equipment for up to 12 months. We will generally limit this to the first year that new or revised emission standards apply. Send the Designated Officer a written request for an exemption before you are in violation. In your request, you must show you are not at fault for the impending violation and that you would face serious economic hardship if we do not grant the exemption. This exemption is not available under this paragraph (a) if you manufacture the engine you need for your own equipment or if complying engines are available from other engine manufacturers that could be used in your equipment, unless we allow it elsewhere in this chapter. We may impose other conditions, including provisions to recover the lost environmental benefit. In determining whether to grant the exemptions, we will consider all relevant factors, including the following:

- (1) The number of engines to be exempted.
- (2) The size of your company and your ability to endure the hardship.
- (3) The amount of time you had to redesign your equipment to accommodate a complying engine.
- (4) Whether there was any breach of contract by an engine supplier.
- (5) The potential for market disruption.

(b) Engine exemption. As an engine manufacturer, you may produce nonconforming engines for the equipment we exempt in paragraph (a) of this section. You do not have to request this exemption for your engines, but you must have written assurance from equipment manufacturers that they need a certain number of exempted engines under this section. Add a permanent, legible label, written in block letters in English, to a readily visible part of each exempted engine. This label must include at least the following items:

- (1) The label heading "EMISSION CONTROL INFORMATION".
- (2) Your corporate name and trademark.
- (3) Engine displacement (in liters), rated power, and model year of the engine or whom to contact for further information.
- (4) The statement "THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.255 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS."

(c) Secondary engine manufacturers. As a secondary engine manufacturer, you may ask for approval to produce exempted engines under this section for up to one year. We may require you to certify your engines to compliance levels above the emission standards that apply. For example, if you need an exemption from a second tier of standards, we may require you to meet the standards that applied to earlier model years.

- (1) For the purpose of this section, a secondary engine manufacturer is a manufacturer that produces an engine by modifying an engine that is made by a different manufacturer for a different type of application. This includes, for example, automotive engines converted for use in industrial applications, or land-based engines converted for use in marine applications. This applies whether the secondary engine manufacturer is modifying a complete or partially complete engine and whether the engine was previously certified to emission standards or not. To be a secondary engine manufacturer, you must not be controlled by the manufacturer of the base engine (or by an entity that also controls the manufacturer of the base engine). In addition, equipment manufacturers that substantially modify engines become secondary engine manufacturers. For the purpose of this definition, "substantially modify" means changing an engine in a way that could change its emission characteristics.
- (2) The provisions in paragraph (a) of this section that apply to equipment manufacturers requesting an exemption apply equally to you, except that you may manufacture the engines. Before we can approve the exemption under this section, you must commit to a plan to make up the lost environmental benefit.

- (i) If you produce uncertified engines under this exemption, we will calculate the lost environmental benefit based on our best estimate of uncontrolled emission rates for your engines.
 - (ii) If you produce engines under this exemption that are certified to a compliance level less stringent than the emission standards that would otherwise apply, we will calculate the lost environmental benefit based on the compliance level you select for your engines.
- (3) The labeling requirements in paragraph (b) of this section apply to your exempted engines; however, if you certify engines to specific compliance levels, state on the label the compliance levels that apply to each engine.

Subpart D—Imports

§1068.301 Does this subpart apply to me?

- (a) This subpart applies to you if you import into the United States engines or equipment subject to our emission standards or equipment containing engines subject to our emission standards.
- (b) In general, engines that you import must be covered by a certificate of conformity unless they were built before emission standards started to apply. This subpart describes the limited cases where we allow importation of exempt or excluded engines.
- (c) The U.S. Customs Service may prevent you from importing an engine if you do not meet the requirements of this subpart. In addition, U.S. Customs Service regulations may contain other requirements for engines imported into the United States (see 19 CFR Chapter I).

§1068.305 How do I get an exemption or exclusion for imported engines?

- (a) Complete the appropriate EPA declaration form before importing any nonconforming engine. These forms are available on the Internet at <http://www.epa.gov/OMS/imports/> or by phone at 202-564-9660.
- (b) If we ask for it, prepare a written request in which you do the following:
 - (1) Give your name, address, telephone number, and taxpayer identification number.
 - (2) Give the engine owner's name, address, telephone number, and taxpayer identification number.
 - (3) Identify the make, model, identification number, and original production year of each engine.
 - (4) Identify which exemption or exclusion in this subpart allows you to import a nonconforming engine and describe how your engine qualifies.
 - (5) Tell us where you will keep your engines if you might need to store them until we approve your request.
 - (6) Authorize us to inspect or test your engines as the Act allows.
- (c) We may ask for more information.
- (d) You may import the nonconforming engines you identify in your request if you get prior written approval from us. The U.S. Customs Service may require you to show them the approval letter. We may temporarily or permanently approve the exemptions or exclusions, as described in this subpart.
- (e) Make sure the engine meets any labeling requirements that apply.

§1068.310 What are the exclusions for imported engines?

Emission standards do not apply to excluded engines that you import. If you show us that your engines qualify under one of the paragraphs of this section, we will approve your request to import excluded engines. You must have our approval to import an engine under paragraph (a) of this section. You may, but are not required to request our approval for the other exclusions in this section. The following engines are excluded:

- (a) Engines used solely for competition. Engines you use solely for competition are excluded. The standard-setting part may set special provisions for the manufacture, sale, or import of engines used solely for competition. Section 1068.101(b)(4) prohibits using these excluded engines for other purposes.
- (b) Stationary engines. This includes engines that will be used in a permanently fixed location and engines meeting the criteria for the exclusion in paragraph (2)(iii) of the nonroad engine definition in §1068.30. Section 1068.101(b)(3) prohibits using these engines for other purposes.
- (c) Other engines. The standard-setting parts may exclude engines used in certain applications. For example,

engines used in aircraft, underground mining, and hobby vehicles are generally excluded.

§1068.315 What are the permanent exemptions for imported engines?

We may approve a permanent exemption for an imported engine under the following conditions:

- (a) National security exemption. You may import an engine under the national security exemption in §1068.225.
- (b) Manufacturer-owned engine exemption. You may import a manufacturer-owned engine, as described in §1068.215.
- (c) Replacement engine exemption. You may import a nonconforming replacement engine as described in §1068.240. To use this exemption, you must be a certificate holder for an engine family we regulate under the same part as the replacement engine.
- (d) Extraordinary circumstances exemption. You may import a nonconforming engine if we grant hardship relief as described in §1068.245.
- (e) Hardship exemption. You may import a nonconforming engine if we grant an exemption for the transition to new or revised emission standards, as described in §1068.255.
- (f) Identical configuration exemption. You may import a nonconforming engine if it is identical to certified engines produced by the same manufacturer, subject to the following provisions:
 - (1) You may import only the following engines under this exemption:
 - (i) Large nonroad spark-ignition engines (see part 1048 of this chapter).
 - (ii) Recreational nonroad spark-ignition engines and equipment (see part 1051 of this chapter).
 - (2) You must meet all the following criteria:
 - (i) You have owned the engine for at least one year.
 - (ii) You agree not to sell, lease, donate, trade, or otherwise transfer ownership of the engine for at least five years, or until the engine is eligible for the exemption in paragraph (h) of this section. During this period, the only acceptable way to dispose of the engine is to destroy or export it.
 - (iii) You use data or evidence sufficient to show that the engine is in a configuration that is the same as an engine the original manufacturer has certified to meet emission standards that apply at the time the manufacturer finished assembling or modifying the engine in question. If you modify the engine to make it identical, you must follow the original manufacturer's complete written instructions.
 - (3) We will tell you in writing if we find the information insufficient to show that the engine is eligible for this exemption. In this case, we will not consider your request further until you address our concerns.
- (g) Ancient engine exemption. If you are not the original engine manufacturer, you may import a nonconforming engine that is subject to a standard-setting part and was first manufactured at least 21 years earlier, as long as it is still in its original configuration.

§1068.320 How must I label an imported engine with a permanent exemption?

- (a) For engines imported under §1068.315 (a), (b), (c), (d), or (e), you must place a permanent label or tag on each engine. If no specific label requirements from subpart C of this part apply, you must meet the following requirements:
 - (1) Attach the label or tag in one piece so no one can remove it without destroying or defacing it.
 - (2) Make sure it is durable and readable for the engine's entire life.
 - (3) Secure it to a part of the engine needed for normal operation and not normally requiring replacement.

- (4) Write it in block letters in English.
 - (5) Make it readily visible to the average person after the engine is installed in the equipment.
- (b) On the engine label or tag, do the following:
- (1) Include the heading "Emission Control Information."
 - (2) Include your full corporate name and trademark.
 - (3) State the engine displacement (in liters) and rated power. If the engine's rated power is not established, state the approximate power rating accurately enough to allow a determination of which standards would otherwise apply.
 - (4) State: "THIS ENGINE IS EXEMPT FROM THE REQUIREMENTS OF [identify the part referenced in 40 CFR 1068.1(a) that would otherwise apply], AS PROVIDED IN [identify the paragraph authorizing the exemption (for example, "40 CFR 1068.315(a)"]]. INSTALLING THIS ENGINE IN ANY DIFFERENT APPLICATION IS A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY."
- (c) Get us to approve alternate label language if it is more accurate for your engine.

§1068.325 What are the temporary exemptions for imported engines?

If we approve a temporary exemption for an engine, you may import it under the conditions in this section. We may ask the U.S. Customs Service to require a specific bond amount to make sure you comply with the requirements of this subpart. You may not sell or lease one of these engines while it is in the United States. You must eventually export the engine as we describe in this section unless you get a certificate of conformity for it or it qualifies for one of the permanent exemptions in §1068.315. Section 1068.330 specifies an additional temporary exemption allowing you to import certain engines you intend to sell or lease.

- (a) Exemption for repairs or alterations. You may temporarily import a nonconforming engine under bond solely to repair or alter it. You may operate the engine in the United States only to repair or alter it or to ship it to or from the service location. Export the engine directly after the engine servicing is complete.
- (b) Testing exemption. You may temporarily import a nonconforming engine under bond for testing if you follow the requirements of §1068.210. You may operate the engine in the United States only to allow testing. This exemption expires one year after you import the engine, unless we approve a one-time request for an extension of up to one more year. The engine must be exported before the exemption expires.
- (c) Display exemption. You may temporarily import a nonconforming engine under bond for display, as described in §1068.220. This exemption expires one year after you import the engine, unless we approve your request for an extension. We may approve an extension of up to one more year for each request, but no more than three years in total. The engine must be exported by the time the exemption expires or directly after the display concludes, whichever comes first.
- (d) Export exemption. You may temporarily import a nonconforming engine to export it, as described in §1068.230. You may operate the engine in the United States only as needed to prepare it for export. Label the engine as described in §1068.230.
- (e) Diplomatic or military exemption. You may temporarily import nonconforming engines without bond if you represent a foreign government in a diplomatic or military capacity. In your request to the Designated Officer (see §1068.305), include either written confirmation from the U.S. State Department that you qualify for this exemption or a copy of your orders for military duty in the United States. We will rely on the State Department or your military orders to determine when your diplomatic or military status expires, at which time you must export your exempt

engines.

§1068.330 How do I import engines to modify for other applications?

This section allows you to import engines in configurations different than their final configuration. This exemption is temporary, as described in paragraph (d) of this section.

(a) This section applies in the following cases:

(1) You import a partially complete engine with the intent to manufacture complete engines for which you have either a certificate of conformity or an exemption that allows you to sell completed engines.

(2) You import an uncertified complete engine with the intent to modify it for installation in an application different than its otherwise intended application (for example, you import a land-based engine to modify it for a marine application). In this case, to qualify for an exemption under this section, you need either a certificate of conformity or an exemption that allows you to sell completed engines.

(3) You import a complete or partially complete engine to modify for an application for which emission standards do not apply.

(b) You may request this exemption in an application for certification. Otherwise, send your request to the Designated Officer. Your request must include:

(1) The name of the supplier of the partially complete engine, or the original manufacturer of the complete engine.

(2) A description of the certificate or exemption that will apply to the engines in the final configuration, or an explanation why a certificate or exemption is not needed.

(3) A brief description of how and where final assembly will be completed.

(4) An unconditional statement that the engines will comply with all applicable regulations in their final configuration.

(c) If we approve a temporary exemption for an engine, you may import it under the conditions in this section. We may ask the U.S. Customs Service to require a specific bond amount to make sure you comply with the requirements of this subpart.

(d) These provisions are intended only to allow you to import engines in the specific circumstances identified in this section, so any exemption under this section expires when you complete the assembly of the engine in its final configuration. If the engine in its final configuration is subject to emission standards, then it must be covered by a certificate or a different exemption before you introduce it into commerce.

§1068.335 What are the penalties for violations?

(a) All imported engines. Unless you comply with the provisions of this subpart, importation of nonconforming engines is violation of sections 203 and 213(d) of the Act. You may then have to export the engines, or pay civil penalties, or both. The U.S. Customs Service may seize unlawfully imported engines.

(b) Temporarily imported engines. If you do not comply with the provisions of this subpart for a temporary exemption, you may forfeit the total amount of the bond in addition to the sanctions we identify in paragraph (a) of this section. We will consider an engine to be exported if it has been destroyed or delivered to the U.S. Customs Service for export or other disposition under applicable Customs laws and regulations. EPA or the U.S. Customs Service may offer you a grace period to allow you to export a temporarily exempted engine without penalty after the exemption expires.

Subpart E—Selective Enforcement Auditing

§1068.401 What is a selective enforcement audit?

- (a) We may conduct or require you to conduct emission tests on your production engines in a selective enforcement audit. This requirement is independent of any requirement for you to routinely test production-line engines.
- (b) If we send you a signed test order, you must follow its directions and the provisions of this subpart. We will tell you where to test the engines. This may be where you produce the engines or any other emission testing facility.
- (c) If we select one or more of your engine families for a selective enforcement audit, we will send the test order to the person who signed the application for certification or we will deliver it in person.
- (d) Within one working day of receiving the test order, notify the Designated Officer which test facility you have selected for emission testing.
- (e) You must do everything we require in the audit without delay.

§1068.405 What is in a test order?

- (a) In the test order, we will specify the following things:
 - (1) The engine family and configuration (if any) we have identified for testing.
 - (2) The engine assembly plant, storage facility, or (if you import the engines) port facility from which you must select engines.
 - (3) The procedure for selecting engines for testing, including a selection rate.
 - (4) The test procedures, duty cycles, and test points, as appropriate, for testing the engines to show that they meet emission standards.
- (b) We may state that we will select the test engines.
- (c) We may identify alternate engine families or configurations for testing in case we determine the intended engines are not available for testing or if you do not produce enough engines to meet the minimum rate for selecting test engines.
- (d) We may include other directions or information in the test order.
- (e) We may ask you to show us that you meet any additional requirements that apply to your engines (closed crankcases, for example).
- (f) In anticipation of a potential audit, you may give us a list of your preferred engine families and the corresponding assembly plants, storage facilities, or (if you import the engines) port facilities from which we should select engines for testing. The information would apply only for a single model year, so it would be best to include this information in your application for certification. If you give us this list before we issue a test order, we will consider your recommendations, but we may select engines differently.
- (g) If you also do routine production-line testing with the selected engine family in the same time period, the test order will tell you what changes you might need to make in your production-line testing schedule.

§1068.410 How must I select and prepare my engines?

- (a) Selecting engines. Select engines as described in the test order. If you are unable to select test engines this way, you may ask us to approve an alternate plan, as long as you make the request before you start selecting engines.
- (b) Assembling engines. Produce and assemble test engines using your normal production and assembly process for that engine family.

- (1) Notify us directly if you make any change in your production, assembly, or quality control processes that might affect emissions between the time you receive the test order and the time you finish selecting test engines.
 - (2) If you do not fully assemble engines at the specified location, we will describe in the test order how to select components to finish assembling the engines. Assemble these components onto the test engines using your documented assembly and quality control procedures.
- (c) Modifying engines. Once an engine is selected for testing, you may adjust, repair, prepare, or modify it or check its emissions only if one of the following is true:
- (1) You document the need for doing so in your procedures for assembling and inspecting all your production engines and make the action routine for all the engines in the engine family.
 - (2) This subpart otherwise allows your action.
 - (3) We approve your action in advance.
- (d) Engine malfunction. If an engine malfunction prevents further emission testing, ask us to approve your decision to either repair the engine or delete it from the test sequence.
- (e) Setting adjustable parameters. Before any test, we may adjust or require you to adjust any adjustable parameter to any setting within its physically adjustable range.
- (1) We may adjust idle speed outside the physically adjustable range as needed until the engine has stabilized emission levels (see paragraph (e) of this section). We may ask you for information needed to establish an alternate minimum idle speed.
 - (2) We may make or specify adjustments within the physically adjustable range by considering their effect on emission levels, as well as how likely it is someone will make such an adjustment with in-use engines.
- (f) Stabilizing emission levels. Before you test production-line engines, you may operate the engine to stabilize the emission levels. Using good engineering judgment, operate your engines in a way that represents the way production engines will be used. You may operate each engine for no more than the greater of two periods:
- (1) 50 hours.
 - (2) The number of hours you operated your emission-data engine for certifying the engine family (see 40 CFR part 1065, subpart E).
- (g) Damage during shipment. If shipping an engine to a remote facility for production-line testing makes necessary an adjustment or repair, you must wait until after the after the initial emission test to do this work. We may waive this requirement if the test would be impossible or unsafe, or if it would permanently damage the engine. Report to us, in your written report under §1068.450, all adjustments or repairs you make on test engines before each test.
- (h) Shipping engines. If you need to ship engines to another facility for testing, make sure the test engines arrive at the test facility within 24 hours after being selected. You may ask that we allow more time if you are unable to do this.
- (i) Retesting after invalid tests. You may retest an engine if you determine an emission test is invalid. Explain in your written report reasons for invalidating any test and the emission results from all tests. If you retest an engine and, within ten days after testing, ask to substitute results of the new tests for the original ones, we will answer within ten days after we receive your information.

§1068.415 How do I test my engines?

- (a) Use the test procedures specified in the standard-setting part for showing that your engines meet emission standards. The test order will give further testing instructions.

- (b) If no test cells are available at a given facility, you may make alternate testing arrangements with our approval.
- (c) Test at least two engines in each 24-hour period (including void tests). However, if your projected U.S. nonroad engine sales within the engine family are less than 7,500 for the year, you may test a minimum of one engine per 24-hour period. If you request and justify it, we may approve a lower testing rate.
- (d) Accumulate service on test engines at a minimum rate of 6 hours per engine during each 24-hour period. The first 24-hour period for service accumulation begins when you finish preparing an engine for testing. The minimum service accumulation rate does not apply on weekends or holidays. You may ask us to approve a lower service accumulation rate. Plan your service accumulation to allow testing at the rate specified in §1068.415. Select engine operation for accumulating operating hours on your test engines to represent normal in-use engine operation for the engine family.
- (e) Test engines in the same order you select them.

§1068.420 How do I know when my engine family fails an SEA?

- (a) A failed engine is one whose final deteriorated test results exceed an applicable emission standard for any regulated pollutant.
- (b) Continue testing engines until you reach a pass decision for all pollutants or a fail decision for one pollutant.
- (c) You reach a pass decision for the SEA requirements when the number of failed engines is less than or equal to the pass decision number in Appendix A to this subpart for the total number of engines tested. You reach a fail decision for the SEA requirements when the number of failed engines is greater than or equal to the fail decision number in Appendix A to this subpart for the total number of engines you test. An acceptable quality level of 40 percent is the basis for the pass or fail decision.
- (d) Consider test results in the same order as the engine testing sequence.
- (e) If you reach a pass decision for one pollutant, but need to continue testing for another pollutant, we will disregard these later test results for the pollutant with the pass decision.
- (f) Appendix A to this subpart lists multiple sampling plans. Use the sampling plan for the projected sales volume you reported in your application for the audited engine family.
- (g) We may choose to stop testing after any number of tests.
- (h) If we test some of your engines in addition to your own testing, we may decide not to include your test results as official data for those engines if there is substantial disagreement between your testing and our testing. We will reinstate your data as valid if you show us that we made an error and your data are correct.
- (i) If we rely on our test data instead of yours, we will notify you in writing of our decision and the reasons we believe your facility is not appropriate for doing the tests we require under this subpart. You may request in writing that we consider your test results from the same facility for future testing if you show us that you have made changes to resolve the problem.

§1068.425 What happens if one of my production-line engines exceeds the emission standards?

- (a) If one of your production-line engines fails to meet one or more emission standards (see §1068.420), the certificate of conformity is automatically suspended for that engine. You must take the following actions before your certificate of conformity can cover that engine:
 - (1) Correct the problem and retest the engine to show it complies with all emission standards.
 - (2) Include in your written report a description of the test results and the remedy for each engine (see §1068.450).

(b) You may at any time ask for a hearing to determine whether the tests and sampling methods were proper (see subpart G of this part).

§1068.430 What happens if an engine family fails an SEA?

(a) We may suspend your certificate of conformity for an engine family if it fails the SEA under §1068.420. The suspension may apply to all facilities producing engines from an engine family, even if you find noncompliant engines only at one facility.

(b) We will tell you in writing if we suspend your certificate in whole or in part. We will not suspend a certificate until at least 15 days after the engine family fails the SEA. The suspension is effective when you receive our notice.

(c) Up to 15 days after we suspend the certificate for an engine family, you may ask for a hearing to determine whether the tests and sampling methods were proper (see subpart G of this part). If we agree before a hearing that we used erroneous information in deciding to suspend the certificate, we will reinstate the certificate.

§1068.435 May I sell engines from an engine family with a suspended certificate of conformity?

You may sell engines that you produce after we suspend the engine family's certificate of conformity only if one of the following occurs:

(a) You test each engine you produce and show it complies with emission standards that apply.

(b) We conditionally reinstate the certificate for the engine family. We may do so if you agree to recall all the affected engines and remedy any noncompliance at no expense to the owner if later testing shows that engines in the engine family still do not comply.

§1068.440 How do I ask EPA to reinstate my suspended certificate?

(a) Send us a written report asking us to reinstate your suspended certificate. In your report, identify the reason for the SEA failure, propose a remedy, and commit to a date for carrying it out. In your proposed remedy include any quality control measures you propose to keep the problem from happening again.

(b) Give us data from production-line testing showing that engines in the remedied engine family comply with all the emission standards that apply.

§1068.445 When may EPA revoke my certificate under this subpart and how may I sell these engines again?

(a) We may revoke your certificate for an engine family in the following cases:

(1) You do not meet the reporting requirements.

(2) Your engine family fails an SEA and your proposed remedy to address a suspended certificate is inadequate to solve the problem or requires you to change the engine's design or emission-control system.

(b) To sell engines from an engine family with a revoked certificate of conformity, you must modify the engine family and then show it complies with the applicable requirements.

(1) If we determine your proposed design change may not control emissions for the engine's full useful life, we will tell you within five working days after receiving your report. In this case we will decide whether production-line testing will be enough for us to evaluate the change or whether you need to do more testing.

(2) Unless we require more testing, you may show compliance by testing production-line engines as described in this subpart.

(3) We will issue a new or updated certificate of conformity when you have met these requirements.

§1068.450 What records must I send to EPA?

- (a) Within 30 calendar days of the end of each audit, send us a report with the following information:
 - (1) Describe any facility used to test production-line engines and state its location.
 - (2) State the total U.S.-directed production volume and number of tests for each engine family.
 - (3) Describe your test engines, including the engine family's identification and the engine's model year, build date, model number, identification number, and number of hours of operation before testing for each test engine.
 - (4) Identify where you accumulated hours of operation on the engines and describe the procedure and schedule you used.
 - (5) Provide the test number; the date, time and duration of testing; test procedure; initial test results before and after rounding; final test results; and final deteriorated test results for all tests. Provide the emission figures for all measured pollutants. Include information for both valid and invalid tests and the reason for any invalidation.
 - (6) Describe completely and justify any nonroutine adjustment, modification, repair, preparation, maintenance, or test for the test engine if you did not report it separately under this subpart. Include the results of any emission measurements, regardless of the procedure or type of equipment.
 - (7) Report on each failed engine as described in §1068.425.
- (b) We may ask you to add information to your written report, so we can determine whether your new engines conform with the requirements of this subpart.
- (c) An authorized representative of your company must sign the following statement:

We submit this report under Sections 208 and 213 of the Clean Air Act. Our testing conformed completely with the requirements of 40 CFR part 1068. We have not changed production processes or quality-control procedures for the engine family in a way that might affect the emission control from production engines. All the information in this report is true and accurate, to the best of my knowledge. I know of the penalties for violating the Clean Air Act and the regulations. (Authorized Company Representative)
- (d) Send reports of your testing to the Designated Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.
- (e) We will send copies of your reports to anyone from the public who asks for them. We will release information about your sales or production volumes, which is all we will consider confidential.

§1068.455 What records must I keep?

- (a) We may review your records at any time, so it is important to keep required information readily available. Organize and maintain your records as described in this section.
- (b) Keep paper records for testing under this subpart for one full year after you complete all the testing required for the selective enforcement audit. For additional storage, you may use any format or media.
- (c) Keep a copy of the written reports described in §1068.450.
- (d) Keep the following additional records:
 - (1) The names of supervisors involved in each test.
 - (2) The name of anyone who authorizes adjusting, repairing, preparing, or modifying a test engine and the names of all supervisors who oversee this work.
 - (3) If you shipped the engine for testing, the date you shipped it, the associated storage or port facility, and the date the engine arrived at the testing facility.

- (4) Any records related to your audit that are not in the written report.
- (5) A brief description of any significant events during testing not otherwise described in the written report or in this section.
- (e) If we ask, you must give us projected or actual production for an engine family. Include each assembly plant if you produce engines at more than one plant.
- (f) We may ask you to keep or send other information necessary to implement this subpart.

Appendix A to Subpart E of Part 1068—Plans for Selective Enforcement Auditing

The following tables describe sampling plans for selective enforcement audits, as described in §1068.420:

Table A-1.—Sampling Plan Code Letter

Projected Engine Family Sales	Code letter ¹	Minimum Number of Tests		Maximum Number of Tests
		To Pass	To Fail	
20 - 50	AA	3	5	20
20 - 99	A	4	6	30
100 - 299	B	5	6	40
300 - 499	C	5	6	50
500 +	D	5	6	60

¹ A 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 A-2—Sampling Plans for Different Engine Family Sales Volumes

Stage	AA		A		B		C		D	
	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #
1										
2										
3	0									
4	0		0							
5	1	5	0		0		0		0	
6	1	6	1	6	1	6	0	6	0	6
7	2	6	1	7	1	7	1	7	1	7
8	2	7	2	7	2	7	2	7	2	8
9	3	7	2	8	2	8	2	8	2	8
10	3	8	3	8	3	8	3	9	3	9
11	4	8	3	8	3	9	3	9	3	9
12	4	9	4	9	4	9	4	10	4	10
13	5	9	5	10	4	10	4	10	4	10
14	5	10	5	10	5	10	5	11	5	11
15	6	10	6	11	5	11	5	11	5	11
16	6	10	6	11	6	12	6	12	6	12
17	7	10	7	12	6	12	6	12	6	12
18	8	10	7	12	7	13	7	13	7	13
19	8	10	8	13	8	13	7	13	7	13
20	9	10	8	13	8	14	8	14	8	14
21			9	14	9	14	8	14	8	14
22			10	14	9	15	9	15	9	15

Stage	AA		A		B		C		D	
	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #
23			10	15	10	15	10	15	9	15
24			11	15	10	16	10	16	10	16
25			11	16	11	16	11	16	11	16
26			12	16	11	17	11	17	11	17
27			12	17	12	17	12	17	12	17
28			13	17	12	18	12	18	12	18
29			14	17	13	18	13	18	13	19
30			16	17	13	19	13	19	13	19
31					14	19	14	19	14	20
32					14	20	14	20	14	20
33					15	20	15	20	15	21
34					16	21	15	21	15	21
35					16	21	16	21	16	22
36					17	22	16	22	16	22
37					17	22	17	22	17	23
38					18	22	18	23	17	23
39					18	22	18	23	18	24
40					21	22	19	24	18	24
41							19	24	19	25
42							20	25	19	26
43							20	25	20	26
44							21	26	21	27
45							21	27	21	27
46							22	27	22	28
47							22	27	22	28
48							23	27	23	29
49							23	27	23	29
50							26	27	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

*Stage refers to the cumulative number of engines tested.

Subpart F—Reporting Defects and Recalling Engines

§1068.501 How do I report engine defects?

(a) General provisions. As an engine manufacturer, you must investigate in certain circumstances whether emission-related components are defective and send us reports as specified by this section.

(1) The term emission-related component includes those components listed in Appendix I of this part. For the purposes of this section, complete engines shall also be considered an emissions-related component. It also includes factory settings of emission-related parameters and specifications listed in Appendix II of this part.

(2) For the purposes of this section, defects do not include damage to emission-related components (or maladjustment of parameters) caused by owners improperly maintaining or abusing their engine.

(3) You must track the information specified in paragraph (b)(2) of this section. You are not required to collect additional information other than that specified in paragraph (b)(2) of this section before reaching the threshold for an investigation specified in paragraph (e) of this section.

(4) You may ask us to allow you to use alternate methods for tracking, investigating, reporting, and correcting emission-related defects. In your request, explain and demonstrate why you believe your alternate system will be at least as effective in tracking, identifying, investigating, evaluating, reporting, and correcting potential and actual emissions-related defects as the requirements in this section.

(5) If we determine that emission-related defects result in a substantial number of properly maintained and used engines not conforming to the regulations of this chapter during their useful life, we may order you to conduct a recall of your engines (see §1068.505).

(6) Send the defect reports and status reports required by this section to the Designated Officer.

(b) Investigation of possible defects. If the number of engines that possibly have a defect, as defined by paragraph (b)(2) of this section, exceed the thresholds specified in paragraph (e) of this section, you must conduct an investigation to determine if an emission-related component is actually defective.

(1) You must track warranty claims, parts shipments, and the other information specified in paragraph (b)(2)(iii) of this section. You must classify an engine as possibly having a defective component if any of the following is true:

(i) A warranty claim is submitted for the component, whether this is under your emission-related warranty or any other warranty.

(ii) You ship a replacement component other than for normally scheduled maintenance during the useful life of the engine.

(iii) You receive any other information indicating the component may be defective, such as information from dealers or hot line complaints.

(2) Your investigation must be prompt, thorough, consider all relevant information, follow scientific and engineering principles, and be designed to obtain all the information specified in paragraph (d) of this section.

(3) Your investigation only needs to consider defects that occur within the useful life period, or within five years after the end of the model year, whichever is longer.

(4) You must continue your investigation until you are able to obtain all the information specified for a defect report in paragraph (d) of this section. Send us an updated defect report anytime you have significant

additional information.

(5) If a component believed to be defective is used in additional engine families or model years, you must investigate whether the component or part is defective when used in these additional engine families or model years, and include these results as part of your defect report.

(6) If your initial investigation concludes that the number of engines with a defect is fewer than the thresholds specified in paragraph (f) of this section, but other information becomes available that may show that the number of engines with a defect exceeds these thresholds, then you must resume your investigation. If you resume an investigation, you must include the information from the earlier investigation to determine whether to send a defect report.

(c) Reporting defects. You must send us a defect report in either of the following cases:

(1) Your investigation shows that the number of engines with a defect exceeds the thresholds specified in paragraph (f) of this section. Send the defect report within 15 days after the date you identify this number of defective engines.

(2) You know a defective emission-related component exists in a number of engines that exceeds the thresholds specified in paragraph (f) of this section, regardless of how you obtain this information. Send the defect report within 15 days after you learn that the number of defects exceeds one of these thresholds.

(d) Contents of a defect report. Include the following information in a defect report:

(1) Your corporate name and a person to contact regarding this defect.

(2) A description of the defect, including a summary of any engineering analyses and associated data, if available.

(3) A description of the engines that may have the defect, including engine families, models, and range of production dates. Note that you must address all model years for the engines, not just the model year for which you triggered the reporting requirement.

(4) An estimate of the number and percentage of each class or category of affected engines that have or may have the defect, and an explanation of how you determined this number.

(5) An estimate of the defect's impact on emissions, with an explanation of how you calculated this estimate and a summary of any emission data demonstrating the impact of the defect, if available.

(6) A description of your plan for addressing the defect or an explanation of your reasons for not believing the defects must be remedied.

(e) Thresholds for conducting a defect investigation. Unless the standard-setting part specifies otherwise, you must begin a defect investigation based on the following threshold values:

(1) For engine with rated power under 560 kW:

(i) When the component is a catalytic converter (or other aftertreatment device), if the number of engines in an engine family that may have the defect exceeds 2 percent of the total number of engines in the engine family or 2,000 engines, whichever is less.

(ii) When the emission-related component is anything but a catalytic converter (or other aftertreatment device), if the number of engines in an engine family that may have the defect exceeds 4 percent of the total number of engines in the engine family or 4,000 engines, whichever is less.

(2) For engine with rated power greater than or equal to 560 kW, if the number of engines in an engine family that may have the defect exceeds 1 percent of the total number of engines in the engine family or 5 engines, whichever is greater.

(f) Thresholds for filing a defect report. You must send a defect report based on the following threshold values:

(1) For engine with rated power under 560 kW:

(i) When the component is a catalytic converter (or other aftertreatment device), if the number of engines in an engine family that has the defect exceeds 0.125 percent of the total number of engines in the engine family or 125 engines, whichever is less.

(ii) When the emission-related component is anything but a catalytic converter (or other aftertreatment device), if the number of engines in an engine family that has the defect exceeds 0.250 percent of the total number of engines in the engine family or 250 engines, whichever is less.

(2) For engine with rated power greater than or equal to 560 kW, if the number of engines in an engine family that has the defect exceeds 0.5 percent of the total number of engines in the engine family or 2 engines, whichever is greater.

(g) How to count defects. In most cases, you may track defects separately for each model year and engine family. For families with annual U.S.-directed production volumes under 5,000 engines, you may apply the percentage thresholds in paragraphs (e) and (f) of this section on the basis of multiple model years, for engines using the same emission-related components. To determine whether you exceed the investigation threshold in paragraph (e) of this section, count defects that you correct before they reach the ultimate purchaser. Do not count these corrected defects to determine whether you exceed the reporting threshold in paragraph (f) of this section.

(h) Status reports. You must send us a mid-year or end-of-year status report if you concluded an investigation during the previous six months without filing a defect report or if you have an unresolved investigation at the end of the six-month period. Include the information specified in paragraph (c) of this section, or explain why the information is not relevant. Send these status reports no later than June 30 and December 31 of each year.

(i) Future production. If you identify a design or manufacturing defect that prevents engines from meeting the requirements of this part, you must correct the defect as soon as possible for any future production for engines in every family affected by the defect. This applies without regard to whether you are required to conduct a defect investigation or submit a defect report under this section.

§1068.505 How does the recall program work?

(a) If we make a determination that a substantial number of properly maintained and used engines do not conform to the regulations of this chapter during their useful life, you must submit a plan to remedy the nonconformity of your engines. We will notify you of our determination in writing. Our notice will identify the class or category of engines affected and describe how we reached our conclusion. If this happens, you must meet the requirements and follow the instructions in this subpart. You must remedy at your expense noncompliant engines that have been properly maintained and used. You may not transfer this expense to a dealer or equipment manufacturer through a franchise or other agreement.

(b) You may ask for a hearing if you disagree with our determination (see 40 CFR part 1068, subpart G).

(c) Unless we withdraw the determination of noncompliance, you must respond to it by sending a remedial plan to the Designated Officer by the later of these two deadlines:

(1) Within 60 days after we notify you.

(2) Within 60 days after a hearing.

(d) Once you have sold an engine to the ultimate purchaser, we may inspect or test the engine only if he or she permits it, or if state or local inspection programs separately provide for it.

(e) You may ask us to allow you to conduct your recall differently than specified in this subpart, consistent with section 207(c) of the Act.

§1068.510 How do I prepare and apply my remedial plan?

(a) In your remedial plan, describe all of the following:

- (1) The class or category of engines to be recalled, including the number of engines involved and the model year or other information needed to identify the engines.
- (2) The modifications, alterations, repairs, corrections, adjustments, or other changes you will make to correct the affected engines.
- (3) A brief description of the studies, tests, and data that support the effectiveness of the remedy you propose to use.
- (4) The instructions you will send to those who will repair the engines under the remedial plan.
- (5) How you will determine the owners' names and addresses.
- (6) How you will notify owners; include copies of any notification letters.
- (7) The proper maintenance or use you will specify, if any, as a condition to be eligible for repair under the remedial plan. Describe how owners should show they meet your conditions.
- (8) The steps owners must take for you to do the repair. You may set a date or a range of dates, specify the amount of time you need, and designate certain facilities to do the repairs.
- (9) Which company (or group) you will assign to do or manage the repairs.
- (10) If your employees or authorized warranty agents will not be doing the work, state who will and say they can do it.
- (11) How you will ensure an adequate and timely supply of parts.
- (12) The effect of proposed changes on fuel consumption, driveability, and safety of the engines you will recall; include a brief summary of the information supporting these conclusions.
- (13) How you intend to label the engines you repair and where you will place the label on the engine (see §1068.515).

(b) We may require you to add information to your remedial plan.

(c) We may require you to test the proposed repair to show it will remedy the noncompliance.

(d) Use all reasonable means to locate owners. We may require you to use government or commercial registration lists to get owners' names and addresses, so your notice will be effective.

(e) The maintenance or use that you specify as a condition for eligibility under the remedial plan may include only things you can show would cause noncompliance. Do not require use of a component or service identified by brand, trade, or corporate name, unless we approved this approach with your original certificate of conformity. Also, do not place conditions on who maintained the engine.

(f) We may require you to adjust your repair plan if we determine owners would be without their engines or equipment for an unreasonably long time.

(g) We will tell you in writing within 15 days of receiving your remedial plan whether we have approved or disapproved it. We will explain our reasons for any disapproval.

(h) Begin notifying owners within 15 days after we approve your remedial plan. If we hold a hearing, but do not change our position about the noncompliance, you must begin notifying owners within 60 days after we complete the hearing, unless we specify otherwise.

§1068.515 How do I mark or label repaired engines?

- (a) Attach a label to each engine you repair under the remedial plan. At your discretion, you may label or mark engines you inspect but do not repair.
- (b) Make the label from a durable material suitable for its planned location. Make sure no one can remove the label without destroying or defacing it.
- (c) On the label, designate the specific recall campaign and state where you repaired or inspected the engine.
- (d) We may waive or modify the labeling requirements if we determine they are overly burdensome.

§1068.520 How do I notify affected owners?

- (a) Notify owners by first class mail, unless we say otherwise. We may require you to use certified mail. Include the following in your notice:
 - (1) State: “The U.S. Environmental Protection Agency has determined that your engine may be emitting pollutants in excess of the Federal emission standards, as defined in Title 40 of the Code of Federal Regulations. These emission standards were established to protect the public health or welfare from air pollution.”.
 - (2) State that you (or someone you designate) will repair these engines at your expense.
 - (3) If we approved maintenance and use conditions in your remedial plan, state that you will make these repairs only if owners show their engines meet the conditions for proper maintenance and use. Describe these conditions and how owners should prove their engines are eligible for repair.
 - (4) Describe the components your repair will affect and say generally how you will repair the engines.
 - (5) State that the engine, if not repaired, may fail an emission inspection test if state or local law requires one.
 - (6) Describe any adverse effects on its performance or driveability that would be caused by not repairing the engine
 - (7) Describe any adverse effects on the functions of other engine components that would be caused by not repairing the engine.
 - (8) Specify the date you will start the repairs, the amount of time you will need to do them, and where you will do them. Include any other information owners may need to know.
 - (9) Include a self-addressed card that owners can mail back if they have sold the engine (or equipment in which the engine is installed); include a space for owners to write the name and address of a buyer.
 - (10) State that owners should call you at a phone number you give to report any difficulty in obtaining repairs.
 - (11) State: “To ensure your full protection under the emission warranty on your engine by federal law, and your right to participate in future recalls, we recommend you have your engine serviced as soon as possible. We may consider your not servicing it to be improper maintenance.”.
- (b) We may require you to add information to your notice or to send more notices.
- (c) You may not in any communication with owners or dealers say or imply that your noncompliance does not exist or that it will not degrade air quality.

§1068.525 What records must I send to EPA?

- (a) Send us a copy of all communications related to the remedial plan you sent to dealers and others doing the repairs. Mail or e-mail us the information at the same time you send it to others.

(b) From the time you begin to notify owners, send us a report within 25 days of the end of each calendar quarter. Send reports for six consecutive quarters or until all the engines are inspected, whichever comes first. In these reports, identify the following:

- (1) The range of dates you needed to notify owners.
- (2) The total number of notices sent.
- (3) The number of engines you estimate fall under the remedial plan (explain how you determined this number).
- (4) The cumulative number of engines you inspected under the remedial plan.
- (5) The cumulative number of these engines you found needed the specified repair.
- (6) The cumulative number of these engines you have repaired.
- (7) The cumulative number of engines you determined to be unavailable due to exportation, theft, retirement, or other reasons (specify).
- (8) The cumulative number of engines you disqualified for not being properly maintained or used.

(c) If your estimated number of engines falling under the remedial plan changes, change the estimate in your next report and add an explanation for the change.

(d) We may ask for more information.

(e) We may waive reporting requirements or adjust the reporting schedule.

(f) If anyone asks to see the information in your reports, we will follow the provisions of §1068.10 for handling confidential information.

§1068.530 What records must I keep?

We may review your records at any time, so it is important that you keep required information readily available.

Keep records associated with your recall campaign for three years after you complete your remedial plan. Organize and maintain your records as described in this section.

(a) Keep a paper copy of the written reports described in §1068.525.

(b) Keep a record of the names and addresses of owners you notified. For each engine, state whether you did any of the following:

- (1) Inspected the engine.
- (2) Disqualified the engine for not being properly maintained or used.
- (3) Completed the prescribed repairs.

(c) You may keep the records in paragraph (b) of this section in any form we can inspect, including computer databases.

§1068.535 How can I do a voluntary recall for emission-related problems?

If we have made a determination that a substantial number of properly maintained and used engines do not conform to the regulations of this chapter during their useful life, you may not use a voluntary recall or other alternate means to meet your obligation to remedy the noncompliance. Thus, this section only applies where you learn that your engine family does not meet the requirements of this chapter and we have not made such a determination.

(a) To do a voluntary recall under this section, first send the Designated Officer a plan, following the guidelines in §1068.510. Within 15 days, we will send you our comments on your plan.

(b) Once we approve your plan, start notifying owners and carrying out the specified repairs.

(c) From the time you start the recall campaign, send us a report within 25 days of the end of each calendar quarter,

following the guidelines in §1068.525(b). Send reports for six consecutive quarters or until all the engines are inspected, whichever comes first.

(d) Keep your reports and the supporting information as described in §1068.530.

§1068.540 What terms do I need to know for this subpart?

The following terms apply to this subpart:

Days means calendar days.

Owner means someone who owns an engine affected by a remedial plan or someone who owns a piece of equipment that has one of these engines.

Subpart G—Hearings

§1068.601 What are the procedures for hearings?

If we agree to hold a hearing related to our decision to order a recall under §1068.505, we will hold the hearing according to the provisions of 40 CFR 85.1807. For any other issues, you may request an informal hearing, as described in 40 CFR 86.1853-01.

Appendix I to Part 1068—Emission-Related Components

This appendix specifies emission-related components that we refer to for describing such things as emission-related defects or requirements related to rebuilding engines.

- I. Emission-related components include any engine parts related to the following systems:
 1. Air-induction system.
 2. Fuel system.
 3. Ignition system.
 4. Exhaust gas recirculation systems.
- II. The following parts are also considered emission-related components:
 1. Aftertreatment devices.
 2. Crankcase ventilation valves.
 3. Sensors.
 4. Electronic control units.
- III. Emission-related components also include any other part whose only purpose is to reduce emissions or whose failure will increase emissions without significantly degrading engine performance.
- IV. We also consider the emission-control information label to be an emission-related component.

Appendix II to Part 1068—Emission-Related Parameters and Specifications

This appendix specifies emission-related parameters and specifications that we refer to for describing such things as emission-related defects or requirements related to rebuilding engines.

- I. Basic Engine Parameters -- Reciprocating Engines.
 1. Compression ratio.
 2. Type of air aspiration (natural, Roots-blown, supercharged, turbocharged).
 3. Valves (intake and exhaust).
 - a. Head diameter dimension.
 - b. Valve lifter or actuator type and valve lash dimension.
 4. Camshaft timing.
 - a. Valve opening - intake exhaust (degrees from top-dead center or bottom-dead center).
 - b. Valve closing - intake exhaust (degrees from top-dead center or bottom-dead center).
 - c. Valve overlap (degrees).
 5. Ports -- two stroke engines (intake and/or exhaust).
 - a. Flow area.
 - b. Opening timing (degrees from top-dead center or bottom-dead center).
 - c. Closing timing (degrees from top-dead center or bottom-dead center).
- II. Intake Air System.
 1. Roots blower/supercharger/turbocharger calibration.
 2. Charge air cooling.
 - a. Type (air-to-air; air-to-liquid).
 - b. Type of liquid cooling (engine coolant, dedicated cooling system).
 - c. Performance.

3. Temperature control system calibration.
4. Maximum allowable inlet air restriction.

III. Fuel System.

1. General.
 - a. Engine idle speed.
 - b. Engine idle mixture.
2. Carburetion.
 - a. Air-fuel flow calibration.
 - b. Idle mixture.
 - c. Transient enrichment system calibration.
 - d. Starting enrichment system calibration.
 - e. Altitude compensation system calibration.
 - f. Hot idle compensation system calibration.
3. Fuel injection for spark-ignition engines.
 - a. Control parameters and calibrations.
 - b. Idle mixture.
 - c. Fuel shutoff system calibration.
 - d. Starting enrichment system calibration.
 - e. Transient enrichment system calibration.
 - f. Air-fuel flow calibration.
 - g. Altitude compensation system calibration.
 - h. Operating pressure(s).
 - i. Injector timing calibration.
4. Fuel injection for compression-ignition engines.
 - a. Control parameters and calibrations.
 - b. Transient enrichment system calibration.
 - c. Air-fuel flow calibration.
 - d. Altitude compensation system calibration.
 - e. Operating pressure(s).
 - f. Injector timing calibration.

IV. Ignition System for Spark-ignition Engines.

1. Control parameters and calibration.
2. Initial timing setting.
3. Dwell setting.
4. Altitude compensation system calibration.
5. Spark plug voltage.

V. Engine Cooling System—thermostat calibration.

VI. Exhaust System—maximum allowable back pressure.

- VII. System for Controlling Exhaust Emissions.
 - 1. Air injection system.
 - a. Control parameters and calibrations.
 - b. Pump flow rate.
 - 2. EGR system.
 - a. Control parameters and calibrations.
 - b. EGR valve flow calibration.
 - 3. Catalytic converter system.
 - a. Active surface area.
 - b. Volume of catalyst.
 - c. Conversion efficiency.
 - 4. Backpressure.

- VIII. System for Controlling Crankcase Emissions.
 - 1. Control parameters and calibrations.
 - 2. Valve calibrations.

- IX. Auxiliary Emission Control Devices (AECD).
 - 1. Control parameters and calibrations.
 - 2. Component calibration(s).

- X. System for Controlling Evaporative Emissions.
 - 1. Control parameters and calibrations.
 - 2. Fuel tank.
 - a. Volume.
 - b. Pressure and vacuum relief settings.

- XI. Warning Systems Related to Emission Controls.
 - 1. Control parameters and calibrations.
 - 2. Component calibrations.