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Distance (m)	Grade (%)
0	0
402	0
804	0.5
1206	0
1210	0
1222	-0.1
1234	0
1244	0
1294	0.36
1344	0
1354	0
1408	-0.28
1504	-1.04
1600	-0.28
1654	0
1666	0
1792	0.39
1860	0.66
1936	1.15
2098	2.44
2260	1.15
2336	0.66
2404	0.39
2530	0
2548	0
2732	-0.46
2800	-0.69
2880	-1.08
2948	-1.53
3100	-2.75
3252	-1.53
3320	-1.08
3400	-0.69
3468	-0.46
3652	0
3666	0
3742	0.35
3818	0.9
3904	1.59
3990	0.9

4066	0.35
4142	0
4158	0
4224	-0.1
4496	-0.69
4578	-0.97
4664	-1.36
4732	-1.78
4916	-3.23
5100	-1.78
5168	-1.36
5254	-0.97
5336	-0.69
5608	-0.1
5674	0
5724	0
5808	0.1
5900	0.17
6122	0.38
6314	0.58
6454	0.77
6628	1.09
6714	1.29
6838	1.66
6964	2.14
7040	2.57
7112	3
7164	3.27
7202	3.69
7292	5.01
7382	3.69
7420	3.27
7472	3
7544	2.57
7620	2.14
7746	1.66
7870	1.29
7956	1.09
8130	0.77
8270	0.58
8462	0.38
8684	0.17

8776	0.1
8860	0
8904	0
9010	-0.38
9070	-0.69
9254	-2.13
9438	-0.69
9498	-0.38
9604	0
9616	0
9664	0.26
9718	0.7
9772	0.26
9820	0
9830	0
9898	-0.34
10024	-1.33
10150	-0.34
10218	0
10228	0
10316	0.37
10370	0.7
10514	1.85
10658	0.7
10712	0.37
10800	0
10812	0
10900	-0.37
10954	-0.7
11098	-1.85
11242	-0.7
11296	-0.37
11384	0
11394	0
11462	0.34
11588	1.33
11714	0.34
11782	0
11792	0
11840	-0.26
11894	-0.7
11948	-0.26

11996	0
12008	0
12114	0.38
12174	0.69
12358	2.13
12542	0.69
12602	0.38
12708	0
12752	0
12836	-0.1
12928	-0.17
13150	-0.38
13342	-0.58
13482	-0.77
13656	-1.09
13742	-1.29
13866	-1.66
13992	-2.14
14068	-2.57
14140	-3
14192	-3.27
14230	-3.69
14320	-5.01
14410	-3.69
14448	-3.27
14500	-3
14572	-2.57
14648	-2.14
14774	-1.66
14898	-1.29
14984	-1.09
15158	-0.77
15298	-0.58
15490	-0.38
15712	-0.17
15804	-0.1
15888	0
15938	0
16004	0.1
16276	0.69
16358	0.97
16444	1.36

16512	1.78
16696	3.23
16880	1.78
16948	1.36
17034	0.97
17116	0.69
17388	0.1
17454	0
17470	0
17546	-0.35
17622	-0.9
17708	-1.59
17794	-0.9
17870	-0.35
17946	0
17960	0
18144	0.46
18212	0.69
18292	1.08
18360	1.53
18512	2.75
18664	1.53
18732	1.08
18812	0.69
18880	0.46
19064	0
19082	0
19208	-0.39
19276	-0.66
19352	-1.15
19514	-2.44
19676	-1.15
19752	-0.66
19820	-0.39
19946	0
19958	0
20012	0.28
20108	1.04
20204	0.28
20258	0
20268	0
20318	-0.36

20368	0
20378	0
20390	0.1
20402	0
20406	0
20808	-0.5
21210	0
21612	0

[86 FR 34497, June 29, 2021. Redesignated at 88 FR 4658, Jan. 24, 2023]

**APPENDIX E TO PART 1037—POWER  
TAKE-OFF UTILITY FACTORS**

Time (min)	Utility factor fraction
0 .....	0
10 .....	0.1
20 .....	0.18
30 .....	0.24
40 .....	0.31
50 .....	0.36
60 .....	0.4
70 .....	0.44
80 .....	0.47
90 .....	0.51
100 .....	0.54
110 .....	0.57
120 .....	0.6
130 .....	0.64
140 .....	0.66
150 .....	0.69
160 .....	0.71
170 .....	0.74
180 .....	0.76
190 .....	0.77
200 .....	0.79
210 .....	0.8
220 .....	0.82
230 .....	0.83
240 .....	0.85
250 .....	0.86
260 .....	0.87
270 .....	0.88
280 .....	0.88
290 .....	0.89
300 .....	0.9
310 .....	0.9
320 .....	0.91
330 .....	0.92
340 .....	0.93
350 .....	0.93
360 .....	0.94
370 .....	0.95
380 .....	0.95
390 .....	0.96
420 .....	0.96
430 .....	0.97
460 .....	0.97
470 .....	0.98

Time (min)	Utility factor fraction
520 .....	0.98
530 .....	0.99
580 .....	0.99
590 .....	1

[81 FR 74048, Oct. 25, 2016. Redesignated at 88 FR 4658, Jan. 24, 2023]

**PART 1039—CONTROL OF EMIS-  
SIONS FROM NEW AND IN-USE  
NONROAD COMPRESSION-IGNI-  
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## Environmental Protection Agency

## § 1039.2

APPENDIX I TO PART 1039—SUMMARY OF PREVIOUS EMISSION STANDARDS

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APPENDIXES III–V TO PART 1039 [RESERVED]

APPENDIX VI TO PART 1039—NONROAD COMPRESSION-IGNITION COMPOSITE TRANSIENT CYCLE

AUTHORITY: 42 U.S.C. 7401–7671q.

SOURCE: 69 FR 39213, June 29, 2004, unless otherwise noted.

### Subpart A—Overview and Applicability

#### § 1039.1 Does this part apply for my engines?

(a) The regulations in this part 1039 apply for all new, compression-ignition nonroad engines (defined in § 1039.801), except as provided in § 1039.5.

(b) This part 1039 applies as follows:

(1) This part 1039 applies for all engines subject to the emission standards specified in subpart B of this part starting with the model years noted in the following table:

TABLE 1 OF § 1039.1—PART 1039  
APPLICABILITY BY MODEL YEAR

Power category	Model year
kW <19 .....	<sup>1</sup> 2008
19 ≤kW <56 .....	<sup>2</sup> 2008
56 ≤kW <130 .....	2012
130 ≤kW ≤560 .....	2011
kW >560 .....	2011

<sup>1</sup>As described in § 1039.102, some engines below 19 kW may not be subject to the emission standards in this part until the 2010 model year.

<sup>2</sup>As described in § 1039.102, some engines in the 19–56 kW power category may not be subject to the emission standards in this part until the 2012 model year.

(2) If you use the provisions of § 1039.104(a) to certify an engine to the emission standards of this part before the model years shown in Table 1 of this section, all the requirements of this part apply for those engines.

(3) Engines originally meeting Tier 1, Tier 2, or Tier 3 standards as specified in appendix I of this part remain subject to the standards in subpart B of this part. This includes uncertified engines that meet standards under 40 CFR 1068.265. Affected engines remain subject to recall provisions as specified in 40 CFR part 1068, subpart F, throughout the useful life corresponding to the original certification. Also, tampering and defeat-de-

vice prohibitions continue to apply for those engines as specified in 40 CFR 1068.101.

(4) This part 1039 applies for other compression-ignition engines as follows:

(i) The provisions of paragraph (c) of this section and § 1039.801 apply for stationary engines beginning January 1, 2006.

(ii) The provisions of § 1039.620 and § 1039.801 apply for engines used solely for competition beginning January 1, 2006.

(c) The definition of nonroad engine in 40 CFR 1068.30 excludes certain engines used in stationary applications. These engines may be required by 40 CFR part 60, subpart IIII, to comply with some of the provisions of this part; otherwise, these engines are only required to comply with the requirements in § 1039.20. In addition, the prohibitions in 40 CFR 1068.101 restrict the use of stationary engines for nonstationary purposes unless they are certified to the same standards that would apply to certain nonroad engines for the same model year.

(d) In certain cases, the regulations in this part 1039 apply to engines at or above 250 kW that would otherwise be covered by 40 CFR part 1048. See 40 CFR 1048.620 for provisions related to this allowance.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40462, July 13, 2005; 71 FR 39184, July 11, 2006; 86 FR 34499, June 29, 2021]

#### § 1039.2 Who is responsible for compliance?

The regulations in this part 1039 contain provisions that affect both manufacturers and others. However, the requirements of this part are generally addressed to the manufacturer. The term “you” generally means the manufacturer, as defined in § 1039.801, especially for issues related to certification. Note that for engines that become new after being placed into service (such as engines converted from highway or stationary use), the requirements that normally apply for manufacturers of freshly manufactured engines apply to the importer or any other entity we allow to obtain a certificate of conformity.

[81 FR 74133, Oct. 25, 2016]

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### § 1039.5 Which engines are excluded from this part's requirements?

This part does not apply to certain nonroad engines, as follows:

(a) *Locomotive engines.* (1) The following locomotive engines are not subject to the provisions of this part 1039:

(i) Engines in locomotives certified under 40 CFR part 1033.

(ii) Engines in locomotives that are exempt from the standards of 40 CFR part 92 or 1033 pursuant to the provisions of 40 CFR part 1033 or 1068 (except for the provisions of 40 CFR 1033.150(e)).

(2) The following locomotive engines are subject to the provisions of this part 1039:

(i) Engines in locomotives exempt from 40 CFR part 1033 pursuant to the provisions of 40 CFR 1033.150(e).

(ii) Locomotive engines excluded from the definition of locomotive in 40 CFR 1033.901.

(iii) Locomotive engines produced under the provisions of 40 CFR 1033.625.

(b) *Marine engines.* (1) The following marine engines are not subject to the provisions of this part 1039:

(i) Engines subject to the standards of 40 CFR part 94.

(ii) Engines not subject to the standards of 40 CFR part 94 only because they were produced before the standards of 40 CFR part 94 started to apply.

(iii) Engines that are exempt from the standards of 40 CFR part 94 pursuant to the provisions of 40 CFR part 94 (except for the provisions of 40 CFR 94.907 or 94.912). For example, an engine that is exempt under 40 CFR 94.906 because it is a manufacturer-owned engine is not subject to the provisions of this part 1039.

(iv) Engines with rated power below 37 kW.

(v) Engines on foreign vessels.

(2) Marine engines are subject to the provisions of this part 1039 if they are exempt from 40 CFR part 94 based on the engine-dressing provisions of 40 CFR 94.907 or the common-family provisions of 40 CFR 94.912.

(c) *Mining engines.* Engines used in underground mining or in underground mining equipment and regulated by the Mining Safety and Health Administration in 30 CFR parts 7, 31, 32, 36, 56, 57, 70, and 75 are not subject to the provisions of this part 1039.

(d) *Hobby engines.* Engines installed in reduced-scale models of vehicles that are not capable of transporting a person are not subject to the provisions of this part 1039.

(e) *Engines used in recreational vehicles.* Engines certified to meet the requirements of 40 CFR part 1051 are not subject to the provisions of this part 1039.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40462, July 13, 2005; 73 FR 59191, Oct. 8, 2008; 75 FR 22988, Apr. 30, 2010; 81 FR 74133, Oct. 25, 2016]

### § 1039.10 How is this part organized?

This part 1039 is divided into the following subparts:

(a) Subpart A of this part defines the applicability of part 1039 and gives an overview of regulatory requirements.

(b) Subpart B of this part describes the emission standards and other requirements that must be met to certify engines under this part. Note that § 1039.102 and § 1039.104 discuss certain interim requirements and compliance provisions that apply only for a limited time.

(c) Subpart C of this part describes how to apply for a certificate of conformity.

(d) [Reserved]

(e) Subpart E of this part describes general provisions for testing in-use engines.

(f) Subpart F of this part describes how to test your engines (including references to other parts of the Code of Federal Regulations).

(g) Subpart G of this part and 40 CFR part 1068 describe requirements, prohibitions, and other provisions that apply to engine manufacturers, equipment manufacturers, owners, operators, rebuilders, and all others.

(h) Subpart H of this part describes how you may generate and use emission credits to certify your engines.

(i) Subpart I of this part contains definitions and other reference information.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40462, July 13, 2005; 72 FR 53129, Sept. 18, 2007]

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### § 1039.15 Do any other regulation parts apply to me?

(a) Part 1065 of this chapter describes procedures and equipment specifications for testing engines to measure exhaust emissions. Subpart F of this part 1039 describes how to apply the provisions of part 1065 of this chapter to determine whether engines meet the exhaust emission standards in this part.

(b) The requirements and prohibitions of part 1068 of this chapter apply to everyone, including anyone who manufactures, imports, installs, owns, operates, or rebuilds any of the engines subject to this part 1039, or equipment containing these engines. 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 exemptions 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 apply if referenced in this part.

[69 FR 39213, June 29, 2004, as amended at 75 FR 22988, Apr. 30, 2010]

### § 1039.20 What requirements from this part apply to excluded stationary engines?

The provisions of this section apply for engines built on or after January 1, 2006.

(a) You must add a permanent label or tag to each new engine you produce or import that is excluded under § 1039.1(c) as a stationary engine and is not required by 40 CFR part 60, subpart IIII, to meet the requirements described in this part, or the requirements described in 40 CFR part 1042, that are equivalent to the requirements applicable to marine or land-based nonroad engines for the same model year. 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) Secure it to a part of the engine needed for normal operation and not normally requiring replacement.

(3) Make sure it is durable and readable for the engine's entire life.

(4) Write it in English.

(5) Follow the requirements in § 1039.135(g) regarding duplicate labels if the engine label is obscured in the final installation.

(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 engine power (or in the case of fire pumps, NFPA nameplate engine power).

(4) State: "THIS ENGINE IS EXEMPTED FROM NONROAD CERTIFICATION REQUIREMENTS AS A "STATIONARY ENGINE." INSTALLING OR USING THIS ENGINE IN ANY OTHER APPLICATION MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY."

(c) Stationary engines required by 40 CFR part 60, subpart IIII, to meet the requirements described in this part or 40 CFR part 1042, must meet the labeling requirements of 40 CFR 60.4210.

[69 FR 39213, June 29, 2004, as amended at 71 FR 39185, July 11, 2006; 76 FR 37977, June 28, 2011; 86 FR 34499, June 29, 2021]

### § 1039.30 Submission of information.

Unless we specify otherwise, send all reports and requests for approval to the Designated Compliance Officer (see § 1039.801). See § 1039.825 for additional reporting and recordkeeping provisions.

[81 FR 74133, Oct. 25, 2016]

## Subpart B—Emission Standards and Related Requirements

### § 1039.101 What exhaust emission standards must my engines meet after the 2014 model year?

The exhaust emission standards of this section apply after the 2014 model year. Certain standards in this section also apply for model year 2014 and earlier. This section presents the full set

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of emission standards that apply after all the transition and phase-in provisions of §§1039.102 and 1039.104 expire. Section 1039.105 specifies smoke standards.

(a) *Emission standards for transient testing.* Transient exhaust emissions from your engines may not exceed the applicable emission standards in Table 1 of this section. Measure emissions using the applicable transient test procedures described in subpart F of this part. The following engines are not

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subject to the transient standards in this paragraph (a):

(1) Engines above 560 kW.

(2) Constant-speed engines.

(b) Emission standards for steady-state testing. Steady-state exhaust emissions from your engines may not exceed the applicable emission standards in Table 1 of this section. Measure emissions using the applicable steady-state test procedures described in subpart F of this part.

Table 1 of §1039.101—Tier 4 Exhaust Emission Standards After the 2014 Model Year, g/kW-hr<sup>a</sup>

Maximum Engine Power	Application	PM	NOx	NMHC	NOx+NMHC	CO
kW < 19	All	0.40 <sup>b</sup>	-	-	7.5	6.6 <sup>c</sup>
19 ≤ kW < 56	All	0.03	-	-	4.7	5.0 <sup>d</sup>
56 ≤ kW < 130	All	0.02	0.40	0.19	-	5.0
130 ≤ kW < 560	All	0.02	0.40	0.19	-	3.5
kW > 560	Generator sets	0.03	0.67	0.19	-	3.5
	All except generator sets	0.04	3.5	0.19	-	3.5

<sup>a</sup>Note that some of these standards also apply for 2014 and earlier model years. This table presents the full set of emission standards that apply after all the transition and phase-in provisions of §1039.102 expire.

<sup>b</sup>See paragraph (c) of this section for provisions related to an optional PM standard for certain engines below 8 kW.

<sup>c</sup>The CO standard is 8.0 g/kW-hr for engines below 8 kW.

<sup>d</sup>The CO standard is 5.5 g/kW-hr for engines below 37 kW.

(c) *Optional PM standard for engines below 8 kW.* You may certify hand-startable, air-cooled, direct injection engines below 8 kW to an optional Tier

4 PM standard of 0.60 g/kW-hr. The term hand-startable generally refers to engines that are started using a hand crank or pull cord. This PM standard



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applies to both steady-state and transient testing, as described in paragraphs (a) and (b) of this section. Engines certified under this paragraph (c) may not be used to generate PM or NO<sub>x</sub> + NMHC emission credits under the provisions of subpart H of this part. These engines may use PM or NO<sub>x</sub> + NMHC emission credits, subject to the FEL caps in paragraph (d)(1) of this section.

(d) *Averaging, banking, and trading.* You may generate or use emission credits under the averaging, banking, and trading (ABT) program, as described in subpart H of this part. This requires that you specify a family

emission limit (FEL) for each pollutant you include in the ABT program for each engine family. These FELs serve as the emission standards for the engine family with respect to all required testing instead of the standards specified in paragraphs (a) and (b) of this section. The FELs determine the not-to-exceed standards for your engine family, as specified in paragraph (e) of this section.

(1) *Primary FEL caps.* The FEL may not be higher than the limits in Table 2 of this section, except as allowed by paragraph (d)(2) of this section or by § 1039.102:

TABLE 2 OF § 1039.101—TIER 4 FEL CAPS AFTER THE 2014 MODEL YEAR, G/KW-HR

Maximum engine power	Application	PM	NO <sub>x</sub>	NO <sub>x</sub> + NMHC
kW <19 .....	All .....	0.80	.....	<sup>1</sup> 9.5
19 ≤kW <56 .....	All .....	0.05	.....	7.5
56 ≤kW <130 .....	All .....	0.04	0.80	.....
130 ≤kW ≤560 .....	All .....	0.04	0.80	.....
kW >560 .....	Generator sets .....	0.05	1.07	.....
	All except generator sets .....	0.07	6.2	.....

<sup>1</sup> For engines below 8 kW, the FEL cap is 10.5 g/kW-hr for NO<sub>x</sub> + NMHC emissions.

(2) *Alternate FEL caps.* For a given power category, you may use the alternate FEL caps shown in Table 3 of this section instead of the FEL caps identi-

fied in paragraph (d)(1) of this section for up to 5 percent of your U.S.-directed production volume in a given model year.

TABLE 3 OF § 1039.101—ALTERNATE FEL CAPS, G/KW-HR

Maximum engine power	Starting model year <sup>1</sup>	PM FEL cap	NO <sub>x</sub> FEL cap
19 ≤kW <56 .....	<sup>2</sup> 2016	0.30	.....
56 ≤kW <130 .....	2016	<sup>3</sup> 0.30	<sup>3</sup> 3.8
130 ≤kW ≤560 .....	2015	0.20	3.8
kW >560 .....	2019	0.10	<sup>4</sup> 3.5

<sup>1</sup> See § 1039.104(g) for alternate FEL caps that apply in earlier model years.

<sup>2</sup> For manufacturers certifying engines under Option #1 of Table 3 of § 1039.102, these alternate FEL caps apply starting with the 2017 model year.

<sup>3</sup> For engines below 75 kW, the FEL caps are 0.40 g/kW-hr for PM emissions and 4.4 g/kW-hr for NO<sub>x</sub> emissions.

<sup>4</sup> For engines above 560 kW, the provision for alternate NO<sub>x</sub> FEL caps is limited to generator-set engines. For example, if you produce 1,000 generator-set engines above 560 kW in a given model year, up to 50 of them may be certified to the alternate NO<sub>x</sub> FEL caps.

(e) *Not-to-exceed standards.* Exhaust emissions from your engines may not exceed the applicable not-to-exceed (NTE) standards in this paragraph (e).

(1) Measure emissions using the procedures described in subpart F of this part.

(2) Except as noted in paragraph (e)(7) of this section, the NTE standard, rounded to the same number of decimal places as the applicable standard in

Table 1 of this section, is determined from the following equation:

$$\text{NTE standard for each pollutant} = (\text{STD}) \times (\text{M})$$

Where:

STD = The standard specified for that pollutant in Table 1 of this section (or paragraph (c) of this section) if you certify without using ABT for that pollutant; or

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the FEL for that pollutant if you certify using ABT.

M = The NTE multiplier for that pollutant, as defined in paragraph (e)(3) of this section.

(3) The NTE multiplier for each pollutant is 1.25, except in the following cases:

If . . .	Or . . .	Then . . .
(i) The engine family is certified to a NO <sub>x</sub> standard less than 2.50 g/kW-hr without using ABT.	The engine family is certified to a NO <sub>x</sub> FEL less than 2.50 g/kW-hr or a NO <sub>x</sub> + NMHC FEL less than 2.70 g/kW-hr.	The multiplier for NO <sub>x</sub> , NMHC, and NO <sub>x</sub> + NMHC is 1.50.
(ii) The engine family is certified to a PM standard less than 0.07 g/kW-hr without using ABT.	The engine family is certified to a PM FEL less than 0.07 g/kW-hr.	The multiplier for PM is 1.50.

(4) There are two sets of specifications of ambient operating regions that will apply for all NTE testing of engines in an engine family. You must choose one set for each engine family and must identify your choice of ambient operating regions in each application for certification for an engine family. You may choose separately for each engine family. Choose one of the following ambient operating regions:

(i) All altitudes less than or equal to 5,500 feet above sea level during all ambient temperature and humidity conditions.

(ii) All altitudes less than or equal to 5,500 feet above sea level, for temperatures less than or equal to the temperature determined by the following equation at the specified altitude:

$$T = -0.00254 \times A + 100$$

Where:

T = ambient air temperature in degrees Fahrenheit.

A = altitude in feet above sea level (A is negative for altitudes below sea level).

(5) Temperature and humidity ranges for which correction factors are allowed are specified in 40 CFR 86.1370–2007(e).

(i) If you choose the ambient operating region specified in paragraph (e)(4)(i) of this section, the temperature and humidity ranges for which correction factors are allowed are defined in 40 CFR 86.1370–2007(e)(1).

(ii) If you choose the ambient operating region specified in paragraph

(e)(4)(ii) of this section, the temperature and humidity ranges for which correction factors are allowed are defined in 40 CFR 86.1370–2007(e)(2).

(6) For engines equipped with exhaust-gas recirculation, the NTE standards of this section do not apply during the cold operating conditions specified in 40 CFR 86.1370–2007(f).

(7) For engines certified to a PM FEL less than or equal to 0.01 g/kW-hr, the PM NTE standard is 0.02 g/kW-hr.

(f) *Fuel types.* The exhaust emission standards in this section apply for engines using the fuel type on which the engines in the engine family are designed to operate, except for engines certified under §1039.615. For engines certified under §1039.615, the standards of this section apply to emissions measured using the specified test fuel. You must meet the numerical emission standards for NMHC in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Alcohol-fueled engines: THCE emissions.

(2) Gaseous-fueled engines: Non-methane-nonethane hydrocarbon emissions.

(3) Other engines: NMHC emissions.

(g) *Useful life.* Your engines must meet the exhaust emission standards in paragraphs (a) through (e) of this section over their full useful life.

(1) The useful life values are shown in the following table, except as allowed by paragraph (g)(2) of this section:

TABLE 4 OF § 1039.101—USEFUL LIFE VALUES

If your engine is certified as . . .	And its maximum power is . . .	And its rated speed is . . .	Then its useful life is . . .
(i) Variable speed or constant speed.	kW <19 .....	Any Speed .....	3,000 hours or five years, whichever comes first.

TABLE 4 OF § 1039.101—USEFUL LIFE VALUES—Continued

If your engine is certified as . . .	And its maximum power is . . .	And its rated speed is . . .	Then its useful life is . . .
(ii) Constant speed . . . . .	19 ≤kW <37 . . . . .	3,000 rpm or higher . . . . .	3,000 hours or five years, whichever comes first.
(iii) Constant speed . . . . .	19 ≤kW <37 . . . . .	Less than 3,000 rpm . . . . .	5,000 hours or seven years, whichever comes first.
(iv) Variable . . . . .	19 ≤kW <37 . . . . .	Any Speed . . . . .	5,000 hours or seven years, whichever comes first.
(v) Variable speed or constant speed.	kW ≥37 . . . . .	Any speed . . . . .	8,000 hours or ten years, whichever comes first.

(2) You may request in your application for certification that we approve a shorter useful life for an engine family. We may approve a shorter useful life, in hours of engine operation but not in years, if we determine that these engines will rarely operate longer than the shorter useful life. If engines identical to those in the engine family have already been produced and are in use, your demonstration must include documentation from such in-use engines. In other cases, your demonstration must include an engineering analysis of information equivalent to such in-use data, such as data from research engines or similar engine models that are already in production. Your demonstration must also include any overhaul interval that you recommend, any mechanical warranty that you offer for the engine or its components, and any relevant customer design specifications. Your demonstration may include any other relevant information. 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 emission standards in this subpart apply to all testing, including certification, selective enforcement audits, and in-use testing. For selective enforcement audits, we will require you to perform duty-cycle testing as specified in §§ 1039.505 and 1039.510. The NTE standards of this section apply for those tests. We will not direct you to do additional testing under a selective en-

forcement audit to show that your engines meet the NTE standards.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40462, July 13, 2005; 81 FR 74133, Oct. 25, 2016; 86 FR 34499, June 29, 2021]

**§ 1039.102 What exhaust emission standards and phase-in allowances apply for my engines in model year 2014 and earlier?**

The exhaust emission standards of this section apply for 2014 and earlier model years. See § 1039.101 for exhaust emission standards that apply to later model years.

(a) *Emission standards for transient testing.* Transient exhaust emissions from your engines may not exceed the applicable emission standards in Tables 1 through 6 of this section. Measure emissions using the applicable transient test procedures described in subpart F of this part. See paragraph (c) of this section for a description of provisions related to the phase-in and phase-out standards shown in Tables 4 through 6 of this section. The emission standards for transient testing are limited for certain engines, as follows:

(1) The transient standards in this section do not apply for the following engines:

(i) Engines below 37 kW for model years before 2013.

(ii) Engines certified under Option #1 of Table 3 of this section. These are the small-volume manufacturer engines certified to the Option #1 standards for model years 2008 through 2015 under § 1039.104(c), and other engines certified to the Option #1 standards for model years 2008 through 2012.

(iii) Engines certified to an alternate FEL during the first four years of the Tier 4 standards for the applicable power category, as allowed in § 1039.104(g). However, you may certify

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these engines to the transient standards in this section to avoid using temporary compliance adjustment factors, as described in §1039.104(g)(2). Note that in some cases this four-year period extends into the time covered by the standards in §1039.101.

(iv) Constant-speed engines.

(v) Engines above 560 kW.

(2) The transient standards in this section for gaseous pollutants do not apply to phase-out engines that you certify to the same numerical standards (and FELs if the engines are certified using ABT) for gaseous pollutants as you certified under the Tier 3 requirements identified in appendix I

of this part. However, except as specified by paragraph (a)(1) of this section, the transient PM emission standards apply to these engines.

(b) Emission standards for steady-state testing. Steady-state exhaust emissions from your engines may not exceed the applicable emission standards in Tables 1 through 7 of this section. Measure emissions using the applicable steady-state test procedures described in subpart F of this part. See paragraph (c) of this section for a description of provisions related to the phase-in and phase-out standards shown in Tables 4 through 6 of this section.

Table 1 of §1039.102—Tier 4 Exhaust Emission Standards (g/kW-hr): kW &lt;19

Maximum engine power	Model years	PM	NO <sub>x</sub> + NMHC	CO
kW <8	2008-2014	0.40 <sup>a</sup>	7.5	8.0
8 ≤kW <19	2008-2014	0.40	7.5	6.6

<sup>a</sup>For engines that qualify for the special provisions in §1039.101(c), you may delay certifying to the standards in this part until 2010. In 2009 and earlier model years, these engines must instead meet the applicable Tier 2 standards and other requirements identified in appendix I of this part. Starting in 2010, these engines must meet a PM standard of 0.60 g/kW-hr, as described in §1039.101(c). Engines certified to the 0.60 g/kW-hr PM standard may not generate ABT credits.

\* \* \* \* \*

TABLE 2 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): 19 &gt;KW &lt;37

Model years	PM	NO <sub>x</sub> + NMHC	CO
2008–2012 .....	0.30	7.5	5.5

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TABLE 2 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (g/kW-HR): 19 >KW  
<37—Continued

Model years	PM	NO <sub>x</sub> + NMHC	CO
2013–2014 .....	0.03	4.7	5.5

Table 3 of §1039.102—Interim Tier 4 Exhaust Emission Standards (g/kW-hr): 37 <KW <56

Option <sup>a</sup>	Model years	PM	NO <sub>x</sub> + NMHC	CO
#1	2008-2012	0.30	4.7	5.0
#2	2012	0.03	4.7	5.0
All	2013-2014	0.03	4.7	5.0

<sup>a</sup>You may certify engines to the Option #1 or Option #2 standards starting in the listed model year. Under Option #1, all engines at or above 37 kW and below 56 kW produced before the 2013 model year must meet the applicable Option #1 standards in this table. These engines are considered to be "Option #1 engines." Under Option #2, all these engines produced before the 2012 model year must meet the applicable standards identified in appendix 1 of this part. Engines certified to the Option #2 standards in model year 2012 are considered "Option #2 engines."

\* \* \* \* \*

TABLE 4 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): 56 &gt;KW &lt;75

Model years <sup>1</sup>	Phase-in option	PM	NO <sub>x</sub>	NMHC	NO <sub>x</sub> + NMHC	CO
2012–2013 .....	Phase-in .....	0.02	0.40	0.19	.....	5.0
	Phase-out .....	0.02	.....	.....	4.7	5.0
2014 .....	All engines .....	0.02	0.40	0.19	.....	5.0

<sup>1</sup> See paragraph (d)(2) of this section for provisions that allow for a different phase-in schedule than that specified in paragraph (c)(1) of this section.

TABLE 5 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): 75 &gt;KW &lt;130

Model years <sup>1</sup>	Phase-in option	PM	NO <sub>x</sub>	NMHC	NO <sub>x</sub> + NMHC	CO
2012–2013 .....	Phase-in .....	0.02	0.40	0.19	.....	5.0
	Phase-out .....	0.02	.....	.....	4.0	5.0
2014 .....	All engines .....	0.02	0.40	0.19	.....	5.0

<sup>1</sup> See paragraph (d)(2) of this section for provisions that allow for a different phase-in schedule than that specified in paragraph (c)(1) of this section.

Table 6 of §1039.102—Interim Tier 4 Exhaust Emission Standards (g/kW-hr): 130 &lt; kW &lt; 560

Model years	Phase-in Option	PM	NO <sub>x</sub>	NMHC	NO <sub>x</sub> +NMHC	CO
2011-2013	Phase-in	0.02	0.40	0.19	-	3.5
	Phase-out	0.02	-	-	4.0	3.5
2014	All engines	0.02	0.40	0.19	-	3.5

TABLE 7 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): KW &gt;560

Model years	Maximum engine power	Application	PM	NO <sub>x</sub>	NMHC	CO
2011–2014 .....	560 < kW ≤ 900 .....	All .....	0.10	3.5	0.40	3.5
		Generator sets .....	0.10	0.67	0.40	3.5
	kW > 900 .....	All except generator sets .....	0.10	3.5	0.40	3.5

(c) *Phase-in requirements.* The following phase-in provisions apply for engines in 56–560 kW power categories meeting the interim Tier 4 standards in paragraphs (a) and (b) of this section:

(1) For each model year before 2014 noted in Tables 4 through 6 of this section, you must certify engine families representing at least 50 percent of your U.S.-directed production volume for each power category to the applicable phase-in standards, except as allowed by paragraph (c)(3), (d)(2), or (e) of this section. Any engines not certified to the phase-in standards must be certified to the corresponding phase-out standards.

(2) Engines certified to the phase-out standards in Tables 4 through 6 of this section must comply with all other requirements that apply to Tier 4 en-

gines, except as otherwise specified in this section.

(3) At the time of certification, show how you intend to meet the phase-in requirements of this paragraph (c) based on projected U.S.-directed production volumes. If your actual U.S.-directed production volume fails to meet the phase-in requirements for a given model year, you must make up the shortfall (in terms of number of engines) by the end of the model year representing the final year of the phase-in period. For example, if you plan in good faith to produce 50 percent of a projected 10,000 engines in the 56–130 kW power category (*i.e.*, 5,000 engines) in 2012 in compliance with the Tier 4 phase-in standards for NO<sub>x</sub> and NMHC in Table 4 of this section, but produce 4,500 such engines of an actual 10,000

engines, you must produce 500 engines in model year 2013 (*i.e.*, the final year of the phase-in for this power category) that meet the Tier 4 phase-in standards above and beyond the production otherwise needed to meet the 50-percent phase-in requirement for model year 2013. If any shortfall exceeds the applicable limit of paragraph (c)(3)(i) or (ii) of this section, that number of phase-out engines will be considered not covered by a certificate of conformity and in violation of §1068.101(a)(1). The shortfall allowed by this paragraph (c)(3) may not exceed a certain number of engines, as follows:

(i) For engine families certified according to the alternate phase-in schedule described in paragraph (d)(2) of this section, for model years prior to the final year of the phase-in, 5 percent of your actual U.S.-directed production volume for that power category in that model year.

(ii) For all other engine families, for model years prior to the final year of the phase-in, 25 percent of your actual U.S.-directed production volume for that power category in that model year.

(iii) No shortfall is allowed in the final year of the phase-in.

(4) Engines you introduce into commerce beyond the limits described in paragraphs (c)(3) of this section will be considered not covered by a certificate of conformity and in violation of §1068.101(a)(1).

(5) For the purposes of this part, the term “phase-in” means relating to a standard that is identified in this section as a phase-in standard and the term “phase-out” means relating to a standard that is identified in this section as a phase-out standard. For example, a 200-kW engine from the 2012 model year that is certified to the 4.0 g/kW-hr NO<sub>x</sub> + NMHC standard in Table 6 of §1039.102 is a phase-out engine.

(d) *Banked credits and alternate phase-in for 56–130 kW engines.* For engines in the 56–130 kW power category, you may use only one of the following additional provisions:

(1) For model years 2012 through 2014, you may use banked NO<sub>x</sub> + NMHC credits from any Tier 2 engine at or above 37 kW certified under the standards identified in appendix I of this part to

meet the NO<sub>x</sub> phase-in standards or the NO<sub>x</sub> + NMHC phase-out standards under paragraphs (b) and (c) of this section, subject to the additional ABT provisions in §1039.740.

(2) Instead of meeting the phase-in requirements of paragraph (c)(1) of this section, you may certify engine families representing at least 25 percent of your U.S.-directed production volume for each model year from 2012 through 2014 to the applicable phase-in standards in Tables 4 and 5 of this section, except as allowed by paragraph (c)(3) or (e) of this section. Any engines not certified to the phase-in standards must be certified to the corresponding phase-out standards. Engines certified under this paragraph (d)(2) may generate NO<sub>x</sub> emission credits only for averaging within the same power category during the same model year. For engines certified under this paragraph (d)(2), the 2014 model year may not extend beyond December 30, 2014.

(e) *Alternate NO<sub>x</sub> standards.* For engines in 56–560 kW power categories during the phase-in of Tier 4 standards, you may certify engine families to the alternate NO<sub>x</sub> or NO<sub>x</sub> + NMHC standards in this paragraph (e) instead of the phase-in and phase-out NO<sub>x</sub> and NO<sub>x</sub> + NMHC standards described in Tables 4 through 6 of this section. Engines certified to an alternate NO<sub>x</sub> standard under this section must be certified to an NMHC standard of 0.19 g/kW-hr. Do not include engine families certified under this paragraph (e) in determining whether you comply with the percentage phase-in requirements of paragraphs (c) and (d)(2) of this section. Except for the provisions for alternate FEL caps in §1039.104(g), the NO<sub>x</sub> and NO<sub>x</sub> + NMHC standards and FEL caps under this paragraph (e) are as follows:

(1) For engines in the 56–130 kW power category, apply the following alternate NO<sub>x</sub> standards and FEL caps:

(i) If you use the provisions of paragraph (d)(1) of this section, your alternate NO<sub>x</sub> standard for any engine family in the 56–130 kW power category is 2.3 g/kW-hr for model years 2012 and 2013. Engines certified to this standard may not exceed a NO<sub>x</sub> FEL cap of 3.0 g/kW-hr.



(ii) If you use the provisions of paragraph (d)(2) of this section, your alternate NO<sub>x</sub> standard for any engine family in the 56–130 kW power category is 3.4 g/kW-hr for model years 2012 through 2014. Engines below 75 kW certified to this standard may not exceed a NO<sub>x</sub> FEL cap of 4.4 g/kW-hr; engines at or above 75 kW certified to this standard may not exceed a NO<sub>x</sub> FEL cap of 3.8 g/kW-hr.

(iii) If you do not use the provisions of paragraph (d) of this section, you may apply the alternate NO<sub>x</sub> standard and the appropriate FEL cap from either paragraph (e)(1)(i) or (ii) of this section.

(2) For engines in the 130–560 kW power category, the alternate NO<sub>x</sub> standard is 2.0 g/kW-hr for model years 2011 through 2013. Engines certified to this standard may not exceed a NO<sub>x</sub> FEL cap of 2.7 g/kW-hr.

(3) You use NO<sub>x</sub> + NMHC emission credits to certify an engine family to the alternate NO<sub>x</sub> + NMHC standards in this paragraph (e)(3) instead of the otherwise applicable alternate NO<sub>x</sub> and NMHC standards. Calculate the alternate NO<sub>x</sub> + NMHC standard by adding 0.1 g/kW-hr to the numerical value of the applicable alternate NO<sub>x</sub> standard of paragraph (e)(1) or (2) of this section. Engines certified to the NO<sub>x</sub> + NMHC standards of this paragraph (e)(3) may not generate emission credits. The FEL caps for engine families certified under this paragraph (e)(3) are the previously applicable NO<sub>x</sub> + NMHC standards identified in appendix I of this part (generally the Tier 3 standards).

(f) *Split families.* For generating or using credits for engines in 56–560 kW power categories during the phase-in of Tier 4 standards, you may split an engine family into two subfamilies (for example, one that uses credits and one that generates credits for the same pollutant).

(1) Identify any split engine families in your application for certification. Your engines must comply with all the standards and requirements applicable to Tier 4 engines, except as noted in this paragraph (f). You may calculate emission credits relative to different emission standards (*i.e.*, phase-in and phase-out standards) for different sets of engines within the engine family,

but the engine family must be certified to a single set of standards and FELs. To calculate NO<sub>x</sub> + NMHC emission credits, add the NO<sub>x</sub> FEL to the NMHC phase-in standard for comparison with the applicable NO<sub>x</sub> + NMHC phase-out standard. Any engine family certified under this paragraph (f) must meet the applicable phase-in standard for NMHC. You may assign the number and configurations of engines within the respective subfamilies any time before the due date for the final report required in § 1039.730. Apply the same label to each engine in the family, including the NO<sub>x</sub> FEL to which it is certified.

(2) For example, a 10,000-unit engine family in the 75–130 kW power category may be certified to meet the standards for PM, NMHC, and CO that apply to phase-in engines, with a 0.8 g/kW-hr FEL for NO<sub>x</sub>. When compared to the phase-out NO<sub>x</sub> + NMHC standard, this engine family would generate positive NO<sub>x</sub> + NMHC emission credits. When compared to the phase-in NO<sub>x</sub> standard, this engine family would generate negative NO<sub>x</sub> emission credits. You could create a subfamily with 2,500 engines (one-quarter of the 10,000 engines) and identify them as phase-in engines. You would count these 2,500, with their negative NO<sub>x</sub> credits, in determining compliance with the 50-percent phase-in requirement in paragraph (c)(1) of this section. You would calculate negative credits relative to the 0.40 g/kW-hr NO<sub>x</sub> standard for these 2,500 engines. You would identify the other 7,500 engines in the family as phase-out engines and calculate positive credits relative to the 4.0 g/kW-hr NO<sub>x</sub> + NMHC standard.

(g) *Other provisions.* The provisions of § 1039.101(d) through (h) apply with respect to the standards of this section, with the following exceptions and special provisions:

(1) *NTE standards.* Use the provisions of § 1039.101(e)(3) to calculate and apply the NTE standards, but base these calculated values on the applicable standards in this section or the applicable FEL, instead of the standards in Table 1 of § 1039.101. All other provisions of § 1039.101(e) apply under this paragraph (g)(1). The NTE standards do not apply

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for certain engines and certain pollutants, as follows:

(i) All engines below 37 kW for model years before 2013.

(ii) All engines certified under Option #1 of Table 3 of this section. These are small-volume manufacturer engines certified to the Option #1 standards for model years 2008 through 2015 under §1039.104(c), and other engines certified to the Option #1 standards for model years 2008 through 2012.

(iii) All engines less than or equal to 560 kW that are certified to an FEL under the alternate FEL program during the first four years of the Tier 4 standards for the applicable power category, as described in §1039.104(g). However, if you apply to meet transient emission standards for these engines under §1039.102(a)(1)(iii), you must also

meet the NTE standards in this paragraph (g)(1).

(iv) Gaseous pollutants for phase-out engines that you certify to the same numerical standards and FELs for gaseous pollutants to which you certified under the Tier 3 requirements identified in appendix I of this part. However, the NTE standards for PM apply to these engines.

(2) Interim FEL caps. As described in §1039.101(d), you may participate in the ABT program in subpart H of this part by certifying engines to FELs for PM, NO<sub>x</sub>, or NO<sub>x</sub> + NMHC instead of the standards in Tables 1 through 7 of this section for the model years shown. The FEL caps listed in the following table apply instead of the FEL caps in §1039.101(d)(1), except as allowed by §1039.104(g):

Table 8 of § 1039.102—Interim Tier 4 FEL Caps, g/kW-hr

Maximum engine power	Phase-in option	Model years <sup>a</sup>	PM	NOx	NOx+NMHC
kW < 19	—	2008-2014	0.80	—	9.5 <sup>b</sup>
19 ≤ kW < 37	—	2008-2012	0.60	—	9.5
37 ≤ kW < 56	—	2008-2012 <sup>c</sup>	0.40	—	7.5
56 ≤ kW < 130	phase-in	2012-2013	0.04	0.80	—
56 ≤ kW < 130	phase-out	2012-2013	0.04	—	6.6 <sup>d</sup>
130 ≤ kW ≤ 560	phase-in	2011-2013	0.04	0.80	—
130 ≤ kW ≤ 560	phase-out	2011-2013	0.04	—	6.4 <sup>e</sup>
kW > 560	—	2011-2014	0.20	6.2	—

<sup>a</sup>For model years before 2015 where this table does not specify FEL caps, apply the FEL caps shown in § 1039.101.

<sup>b</sup>For engines below 8 kW, the FEL cap is 10.5 g/kW-hr for NOx + NMHC emissions.

<sup>c</sup>For manufacturers certifying engines to the standards of this part 1039 in 2012 under Option #2 of Table 3 of § 1039.102, the FEL caps for 37-56 kW engines in the 19-56 kW category of Table 2 of § 1039.101 apply for model year 2012 and later; see appendix 1 of this part for provisions that apply to earlier model years.

<sup>d</sup>For engines below 75 kW, the FEL cap is 7.5 g/kW-hr for NOx + NMHC emissions.

<sup>e</sup>For engines below 225 kW, the FEL cap is 6.6 g/kW-hr for NOx + NMHC emissions.

(3) *Crankcase emissions.* The crankcase emission requirements of § 1039.115(a) do not apply to engines using charge-air compression that are certified to an

FEL under the alternate FEL program in § 1039.104(g) during the first four years of the Tier 4 standards for the applicable power category.

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(4) *Special provisions for 37–56 kW engines.* For engines at or above 37 kW and below 56 kW from model years 2008 through 2012, you must add information to the emission-related installation instructions to clarify the equipment manufacturer's obligations under § 1039.104(f).

[69 FR 39213, June 29, 2004, as amended at 72 FR 53130, Sept. 18, 2007; 73 FR 59191, Oct. 8, 2008; 75 FR 68461, Nov. 8, 2010; 81 FR 74033, Oct. 25, 2016; 86 FR 34500, June 29, 2021]

### § 1039.104 Are there interim provisions that 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 apply.

(a) *Incentives for early introduction.* This paragraph (a) allows you to reduce the number of engines subject to the applicable standards in § 1039.101 or § 1039.102, when some of your engines are certified to the specified levels earlier than otherwise required. The engines that are certified early are considered offset-generating engines. The provisions of this paragraph (a), which describe the requirements applicable to offset-generating engines, apply beginning in model year 2007. These offset-generating engines may generate additional allowances for equipment manufacturers under the incentive program described in § 1039.627; you may instead use these offsets under paragraph (a)(2) of this section in some cases.

(1) For early-compliant engines to generate offsets for use either under

this paragraph (a) or under § 1039.627, you must meet the following general provisions:

(i) You may not generate offsets from engines below 19 kW.

(ii) You must begin actual production of engines covered by the corresponding certificate by the following dates:

(A) For engines at or above 19 kW and below 37 kW: September 1, 2012.

(B) For engines at or above 37 kW and below 56 kW: September 1, 2012 if you choose Option #1 in Table 3 of § 1039.102, or September 1, 2011 if you do not choose Option #1 in Table 3 of § 1039.102.

(C) For engines in the 56–130 kW power category: September 1, 2011.

(D) For engines in the 130–560 kW power category: September 1, 2010.

(E) For engines above 560 kW: September 1, 2014.

(iii) Engines you produce after December 31 of the year shown in paragraph (a)(1)(ii) of this section may not generate offsets.

(iv) You may not use ABT credits to certify offset-generating engines.

(v) Offset-generating engines must be certified to the Tier 4 standards and requirements under this part 1039.

(2) If equipment manufacturers decline offsets for your offset-generating engines under § 1039.627, you may not generate ABT credits with these engines, but you may reduce the number of engines that are required to meet the standards in § 1039.101 or § 1039.102 as follows:

For every . . .	With maximum engine power . . .	That are certified to the applicable standards in . . .	You may reduce the number of engines in the same power category that are required to meet the . . .	In later model years by . . .
(i) 2 engines . . . . .	19 ≤ kW < 37 . . . . .	Table 2 of § 1039.102 <sup>1</sup> .	PM standard in Table 2 of § 1039.102 applicable to model year 2013 or 2014 engines or the PM standard in Table 1 of § 1039.101.	3 engines.
(ii) 2 engines . . . . .	56 ≤ kW ≤ 560 . . . . .	Table 4, 5, or 6 of § 1039.102 for Phase-out engines.	Phase-out standards in Tables 4 through 6 of § 1039.102.	3 engines.
(iii) 2 engines . . . . .	kW ≥ 19 . . . . .	Table 1 of § 1039.101	Standards in Tables 2 through 7 of § 1039.102 or standards in Table 1 of § 1039.101.	3 engines. <sup>2</sup>
(iv) 1 engine . . . . .	kW ≥ 19 . . . . .	Table 1 of § 1039.101 + 0.20 g/kW-hr NO <sub>x</sub> standard.	Standards in Tables 2 through 7 of § 1039.102 or standards in Table 1 of § 1039.101.	2 engines. <sup>2</sup>

<sup>1</sup> The engine must be certified to the PM standard applicable to model year 2013 engines, and to the NO<sub>x</sub> + NMHC and CO standards applicable to model year 2012 engines.

<sup>2</sup> For engines above 560 kW, offsets from generator-set engines may be used only for generator-set engines. Offsets from engines for other applications may be used only for other applications besides generator sets.

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(3) Example: If you produce 100 engines in the 56–130 kW power category in model year 2008 that are certified to the 56–130 kW standards listed in § 1039.101, and you produced 10,000 engines in this power category in model year 2015, then only 9,850 of these model year 2015 engines would need to comply with the standards listed in § 1039.101. The 100 offset-generating engines in model year 2008 could not use or generate ABT credits.

(4) Offset-using engines (that is, those not required to certify to the standards of § 1039.101 or § 1039.102 under paragraph (a)(2) of this section) are subject to the following provisions:

(i) If the offset is being used under paragraph (a)(2)(i) of this section for an engine that would otherwise be certified to the model year 2013 or 2014 standards in Table 2 of § 1039.102 or the standards in Table 1 of § 1039.101, this engine must be certified to the standards and requirements of this part 1039, except that the only PM standard that applies is the steady-state PM standard that applies for model year 2012. Such an engine may not generate ABT credits.

(ii) If the offset is being used under paragraph (a)(2)(ii) of this section for an engine that would otherwise be certified to the phase-out standards in Tables 4 through 6 of § 1039.102, this engine must be certified to the standards and requirements of this part 1039, except that the PM standard is the Tier 3 PM standard that applies for this engine's maximum power. Such an engine will be treated as a phase-out engine for purposes of determining compliance with percentage phase-in requirements. Such an engine may not generate ABT credits.

(iii) All other offset-using engines must meet the standards and other provisions that apply in model year 2011 for engines in the 19–130 kW power categories, in model year 2010 for engines in the 130–560 kW power category, or in model year 2014 for engines above 560 kW. Show that engines meet these emission standards by meeting all the requirements of § 1068.265. You must meet the labeling requirements in § 1039.135, but add the following statement instead of the compliance statement in § 1039.135(c)(12): “THIS EN-

GINE MEETS U.S. EPA EMISSION STANDARDS UNDER 40 CFR 1039.104(a).” For power categories with a percentage phase-in, these engines should be treated as phase-in engines for purposes of determining compliance with phase-in requirements.

(5) If an equipment manufacturer claims offsets from your engine for use under § 1039.627, the engine generating the offset must comply with the requirements of paragraph (a)(1) of this section. You may not generate offsets for use under paragraphs (a)(2) and (5) of this section for these engines. You may generate ABT credits from these engines as follows:

(i) To generate emission credits for NO<sub>x</sub>, NO<sub>x</sub> + NMHC, and PM, the engine must be certified to FELs at or below the standards in paragraph (a)(2) of this section.

(ii) Calculate credits according to § 1039.705 but use as the applicable standard the numerical value of the standard to which the engine would have otherwise been subject if it had not been certified under this paragraph (a).

(iii) For the production volume, use the number of engines certified under this paragraph (a) for which you do not claim offsets under paragraph (a)(2) of this section.

(6) You may include engines used to generate offsets under this paragraph (a) and engines used to generate offsets under § 1039.627 in the same engine family, subject to the provisions of § 1039.230. The engine must be certified to FELs, as specified in paragraph (a)(5)(i) of this section. The FELs must be below the standard levels specified in paragraph (a)(2) of this section and those specified in § 1039.627. In the reports required in § 1039.730, include the following information for each model year:

(i) The total number of engines that generate offsets under this paragraph (a).

(ii) The number of engines used to generate offsets under paragraph (a)(2) of this section.

(iii) The names of equipment manufacturers that intend to use your offsets under § 1039.627 and the number of offsets involved for each equipment manufacturer.

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(b) *In-use compliance limits.* For purposes of determining compliance after title or custody has transferred to the ultimate purchaser, calculate the applicable in-use compliance limits by adjusting the applicable standards or FELs. This applies only for engines at or above 19 kW. The NO<sub>x</sub> adjustment applies only for engines with a NO<sub>x</sub>

FEL no higher than 2.1 g/kW-hr. The PM adjustment applies only for engines with a PM FEL no higher than the PM standard in §1039.101 for the appropriate power category. Add the following adjustments to the otherwise applicable standards or FELs (steady-state, transient, and NTE) for NO<sub>x</sub> and PM:

In model years . . .	If your engine's maximum power is . . .	The NO <sub>x</sub> adjustment in g/kW-hr is . . .	The PM adjustment in g/kW-hr is . . .
2013–2014 .....	19 ≤kW <56 .....	not allowed .....	0.01
2012–2016 .....	56 ≤kW <130 .....	0.16 for operating hours ≤2000 .....	0.01
		0.25 for operating hours 2001 to 3400 .....	
		0.34 for operating hours >3400 .....	
2011–2015 .....	130 ≤kW <560 .....	0.16 for operating hours ≤2000 .....	0.01
		0.25 for operating hours 2001 to 3400 .....	
		0.34 for operating hours >3400 .....	
2011–2016 .....	kW >560 .....	0.16 for operating hours ≤2000 .....	0.01
		0.25 for operating hours 2001 to 3400 .....	
		0.34 for operating hours >3400 .....	

(c) *Provisions for small-volume manufacturers.* Special provisions apply if you are a small-volume engine manufacturer subject to the requirements of this part. You must notify us in writ-

ing before January 1, 2008 if you intend to use these provisions.

(1) You may delay complying with certain otherwise applicable Tier 4 emission standards and requirements as described in the following table:

If your engine's maximum power is . . .	You may delay meeting . . .	Until model year . . .	Before that model year the engine must comply with . . .
(i) kW <19 .....	The standards and requirements of this part.	2011	The standards and requirements described in appendix I of this part.
(ii) 19 ≤kW <37 .....	The Tier 4 standards and requirements of this part that would otherwise be applicable in model year 2013.	2016	The Tier 4 standards and requirements that apply for model year 2008.
(iii) 37 ≤kW <56 .....	See paragraph (c)(2) of this section for special provisions that apply for engines in this power category.		
(iv) 56 ≤kW <130 .....	The standards and requirements of this part.	2015	The standards and requirements described in appendix I of this part.

(2) To use the provisions of this paragraph (c) for engines at or above 37 kW and below 56 kW, choose one of the following:

(i) If you comply with the 0.30 g/kW-hr PM standard in §1039.102 in all model years from 2008 through 2012 without using PM credits, you may continue meeting that standard through 2015.

(ii) If you do not choose to comply with paragraph (c)(2)(i) of this section, you may continue to comply with the standards and requirements described in appendix I of this part for model

years through 2012, but you must begin complying in 2013 with Tier 4 standards and requirements specified in Table 3 of §1039.102 for model years 2013 and later.

(3) After the delays indicated in paragraph (c)(1) and (2) of this section, you must comply with the same Tier 4 standards and requirements as all other manufacturers.

(4) For engines not in the 19–56 kW power category, if you delay compliance with any standards under this paragraph (c), you must do all the following things for the model years when

you are delaying compliance with the otherwise applicable standards:

(i) Produce engines that meet all the emission standards identified in appendix I of this part and other requirements in this part applicable for that model year, except as noted in this paragraph (c).

(ii) Meet the labeling requirements in this part that apply for certified engines but use the following alternative compliance statement: “THIS ENGINE COMPLIES WITH U.S. EPA REGULATIONS FOR [CURRENT MODEL YEAR] NONROAD COMPRESSION—IGNITION ENGINES UNDER 40 CFR 1039.104(c).”.

(5) For engines in the 19–56 kW power category, if you delay compliance with any standards under this paragraph (c), you must do all the following things for the model years when you are delaying compliance with the otherwise applicable standards:

(i) Produce engines in those model years that meet all the emission standards and other requirements that applied for your model year 2008 engines in the same power category.

(ii) Meet the labeling requirements in § 1039.135, but use the following compliance statement instead of the compliance statement in § 1039.135: “THIS ENGINE COMPLIES WITH U.S. EPA REGULATIONS FOR [CURRENT MODEL YEAR] NONROAD COMPRESSION-IGNITION ENGINES UNDER 40 CFR 1039.104(c).”.

(iii) Notify the equipment manufacturer that the engines you produce under this section are excluded from the production volumes associated with the equipment-manufacturer allowance program in § 1039.625.

(6) The provisions of this paragraph (c) may not be used to circumvent the requirements of this part.

(d) *Deficiencies for NTE standards.* You may ask us to accept as compliant an engine that does not fully meet specific requirements under the applicable NTE standards. Such deficiencies are intended to allow for minor deviations from the NTE standards under limited conditions. We expect your engines to have functioning emission-control hardware that allows you to comply with the NTE standards.

(1) Request our approval for specific deficiencies in your application for certification, or before you submit your application. We will not approve deficiencies retroactively to cover engines already certified. In your request, identify the scope of each deficiency and describe any auxiliary emission-control devices you will use to control emissions to the lowest practical level, considering the deficiency you are requesting.

(2) We will approve a deficiency only if compliance would be infeasible or unreasonable considering such factors as the technical feasibility of the given hardware and the applicable lead time and production cycles—including schedules related to phase-in or phase-out of engines. We may consider other relevant factors.

(3) Our approval applies only for a single model year and may be limited to specific engine configurations. We may approve your request for the same deficiency in the following model year if correcting the deficiency would require unreasonable hardware or software modifications and we determine that you have demonstrated an acceptable level of effort toward complying.

(4) You may ask for any number of deficiencies in the first three model years during which NTE standards apply for your engines. For the next four model years, we may approve up to three deficiencies per engine family. Deficiencies of the same type that apply similarly to different power ratings within a family count as one deficiency per family. We may condition approval of any such additional deficiencies during these four years on any additional conditions we determine to be appropriate. We will not approve deficiencies after the seven-year period specified in this paragraph (d)(4).

(e) *Diesel test fuels and corresponding labeling requirements.* For diesel-fueled engines in 2011 and later model years, the diesel test fuel is ultra low-sulfur diesel fuel specified in 40 CFR part 1065. For diesel-fueled engines in 2010 and earlier model years, use test fuels and meet labeling requirements as follows:

(1) Use the following test fuels in 2010 and earlier model years:

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(i) Unless otherwise specified, the diesel test fuel is low-sulfur diesel fuel specified in 40 CFR part 1065.

(ii) In model years 2007 through 2010, you may use ultra low-sulfur diesel fuel as the test fuel for any engine family that employs sulfur-sensitive technology if you can demonstrate that in-use engines in the family will use diesel fuel with a sulfur concentration no greater than 15 ppm.

(iii) You may use ultra low-sulfur diesel fuel as the test fuel for engine families in any power category below 56 kW, as long as none of the engines in your engine family employ sulfur-sensitive technologies, you ensure that ultimate purchasers of equipment using these engines are informed that ultra low-sulfur diesel fuel is recommended, and you recommend to equipment manufacturers that a label be applied at the fuel inlet recommending 15 ppm fuel.

(iv) For the engines described in § 1039.101(c) that are certified to the 0.60 g/kW-hr PM standard in Table 1 of § 1039.102 in the 2010 model year, you may test with the ultra low-sulfur fuel specified in 40 CFR part 1065.

(2) Meet the labeling requirements of this paragraph (e)(2) (or other labeling requirements we approve) to identify the applicable test fuels specified in paragraph (e)(1) of this section. Provide instructions to equipment manufacturers to ensure that they are aware of these labeling requirements.

(i) For engines certified under the provisions of paragraph (e)(1)(i) of this section, include the following statement on the emission control information label and the fuel-inlet label specified in § 1039.135: “LOW SULFUR FUEL OR ULTRA LOW SULFUR FUEL ONLY”.

(ii) For engines certified under the provisions of paragraph (e)(1)(ii) of this section, include the following statement on the emission control information label and the fuel-inlet label specified in § 1039.135: “ULTRA LOW SULFUR FUEL ONLY”.

(iii) For engines certified under the provisions of paragraph (e)(1)(iii) of this section, include the following statement on the emission control information label specified in § 1039.135:

“ULTRA LOW SULFUR FUEL RECOMMENDED”.

(3) For model years 2010 and earlier, we will use the test fuel that you use under paragraph (e)(1) of this section, subject to the conditions of paragraph (e)(1) of this section.

(f) *Requirements for equipment manufacturers.* If you produce equipment with engines certified to Tier 3 standards under Option #2 of Table 3 of § 1039.102 during model years from 2008 through 2011, then a minimum number of pieces of equipment you produce using 2012 model year engines must have engines certified to the Option #2 standards, as follows:

(1) For equipment you produce with 2012 model year engines at or above 37 kW and below 56 kW, determine the minimum number of these engines that must be certified to the Option #2 standards in Table 3 of § 1039.102 as follows:

(i) If all the equipment you produce using 2008 through 2011 model year engines use engines certified to Tier 3 standards under Option #2 of Table 3 of § 1039.102, then all the 2012 model year engines you install must be certified to the Option #2 standards of Table 3 of § 1039.102.

(ii) If you produce equipment using 2008 through 2011 model year engines with some engines certified to Option #1 standards of Table 3 of § 1039.102 and some engines certified to Tier 3 standards under Option #2 standards of Table 3 of § 1039.102, calculate the minimum number of 2012 model year engines you must install that are certified to the Option #2 standards of Table 3 of § 1039.102 from the following equation:

$$\text{Minimum number} = \frac{[(T - O_1 - F)]}{(T - F) - 0.05} \times P$$

Where:

T = The total number of 2008–2010 model year engines at or above 37 kW and below 56 kW that you use in equipment you produce.

O<sub>1</sub> = The number of engines from the 2008–2010 model years certified under Option #1 of Table 3 of § 1039.102 that you use in equipment you produce.

F = The number of 2008–2010 model year engines at or above 37 kW and below 56 kW that you use in equipment you produce under the flexibility provisions of § 1039.625.



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P = The total number of 2012 model year engines at or above 37 kW and below 56 kW that you use in equipment you produce.

(2) As needed for the calculation required by this paragraph (f), keep records of all equipment you produce using 2008–2012 model year engines at or above 37 kW and below 56 kW. If you fail to keep these records, you may not use any 2012 model year engines certified to Option #1 standards in your equipment.

(3) If you fail to comply with the provisions of this paragraph (f), then using 2012 model year engines certified under Option #1 of Table 3 of §1039.102 (or certified to less stringent standards) in such equipment violates the prohibitions in §1068.101(a)(1).

(g) *Alternate FEL caps.* You may certify engines to the FEL caps in Table 1 of this section instead of the otherwise applicable FEL caps in §1039.101(d)(1), §1039.102(e), or §1039.102(g)(2) for the indicated model years, subject to the following provisions:

(1) The provisions of this paragraph (g) apply for limited numbers of engines as specified in this paragraph (g)(1). If you certify an engine under an alternate FEL cap in this paragraph (g) for any pollutant, count it toward the allowed percentage of engines certified to the alternate FEL caps.

(i) Except as specified in paragraph (g)(1)(ii) of this section, the number of engines certified to the FEL caps in Table 1 of this section must not exceed 20 percent in any single model year in each power category, and the sum of percentages over the 4-year period

must not exceed a total of 40 percent in each power category.

(ii) For the 19–56 kW power category, the number of engines certified to the FEL caps in Table 1 of this section must not exceed 40 percent in any single model year, and the sum of percentages over the 4-year period must not exceed a total of 80 percent.

(2) If your engine is not certified to transient emission standards under the provisions of §1039.102(a)(1)(iii), you must adjust your FEL upward by a temporary compliance adjustment factor (TCAF) before calculating your negative emission credits under §1039.705, as follows:

(i) The temporary compliance adjustment factor for NO<sub>x</sub> and for NO<sub>x</sub> + NMHC is 1.1.

(ii) The temporary compliance adjustment factor for PM is 1.5.

(iii) The adjusted FEL (FEL<sub>adj</sub>) for calculating emission credits is determined from the steady-state FEL (FEL<sub>ss</sub>) using the following equation:

$$FEL_{adj} = (FEL_{ss}) \times (TCAF)$$

(iv) The unadjusted FEL (FEL<sub>ss</sub>) applies for all purposes other than credit calculation.

(3) These alternate FEL caps may not be used for phase-in engines.

(4) Do not apply TCAFs to gaseous emissions for phase-out engines that you certify to the same numerical standards (and FELs if the engines are certified using ABT) for gaseous pollutants as you certified under the Tier 3 requirements identified in appendix I of this part.

TABLE 2 OF § 1039.104—ALTERNATE FEL CAPS

Maximum engine power	PM FEL cap, g/kW-hr	Model years for the alternate PM FEL cap	NO <sub>x</sub> FEL cap, g/kW-hr <sup>a</sup>	Model years for the alternate NO <sub>x</sub> FEL cap
19 ≤kW <56 .....	0.30	<sup>b</sup> 2012–2015		
56 ≤kW <130 <sup>c</sup> .....	0.30	2012–2015	3.8	<sup>d</sup> 2012–2015
130 ≤kW ≤560 .....	0.20	2011–2014	3.8	<sup>e</sup> 2011–2014
kW >560 <sup>f</sup> .....	0.10	2015–2018	3.5	2015–2018

<sup>a</sup> The FEL cap for engines demonstrating compliance with a NO<sub>x</sub> + NMHC standard is equal to the previously applicable NO<sub>x</sub> + NMHC standard specified in appendix I of this part (generally the Tier 3 standards).

<sup>b</sup> For manufacturers certifying engines under Option #1 of Table 3 of § 1039.102, these alternate FEL caps apply to all 19–56 kW engines for model years from 2013 through 2016 instead of the years indicated in this table. For manufacturers certifying engines under Option #2 of Table 3 of § 1039.102, these alternate FEL caps do not apply to 19–37 kW engines except in model years 2013 to 2015.

<sup>c</sup> For engines below 75 kW, the FEL caps are 0.40 g/kW-hr for PM emissions and 4.4 g/kW-hr for NO<sub>x</sub> emissions.

<sup>d</sup> For manufacturers certifying engines in this power category using a percentage phase-in/phase-out approach instead of the alternate NO<sub>x</sub> standards of § 1039.102(e)(1), the alternate NO<sub>x</sub> FEL cap in the table applies only in the 2014–2015 model years if certifying under § 1039.102(d)(1), and only in the 2015 model year if certifying under § 1039.102(d)(2).

<sup>e</sup> For manufacturers certifying engines in this power category using the percentage phase-in/phase-out approach instead of the alternate NO<sub>x</sub> standard of § 1039.102(e)(2), the alternate NO<sub>x</sub> FEL cap in the table applies only for the 2014 model year.

<sup>f</sup> For engines above 560 kW, the provision for alternate NO<sub>x</sub> FEL caps is limited to generator-set engines.

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(5) You may certify engines under this paragraph (g) in any model year provided for in Table 1 of this section without regard to whether or not the engine family's FEL is at or below the otherwise applicable FEL cap. For example, a 200 kW engine certified to the  $\text{NO}_x$  + NMHC standard of § 1039.102(e)(3) with an FEL equal to the FEL cap of 4.0 g/kW-hr may nevertheless be certified under this paragraph (g).

(6) For engines you produce under this paragraph (g) after the Tier 4 final standards take effect, you may certify based on a  $\text{NO}_x$  + NMHC FEL as described in Table 1 of this section. Calculate emission credits for these engines relative to the applicable  $\text{NO}_x$  standard in § 1039.101 or § 1039.102, plus 0.1 g/kW-hr.

(h) *Delayed compliance with labeling requirements.* Before the 2011 model year, you may omit the dates of manufacture from the emission control information label as specified in § 1039.135(c)(6) if you keep those records and provide them to us upon request.

(i) *Lead time for diagnostic controls.* Model year 2017 and earlier engines are not subject to the requirements for diagnostic controls as specified in § 1039.110.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40462, July 13, 2005; 72 FR 53130, Sept. 18, 2007; 75 FR 22988, Apr. 30, 2010; 75 FR 68461, Nov. 8, 2010; 79 FR 7083, Feb. 6, 2014; 81 FR 74133, Oct. 25, 2016; 86 FR 34504, June 29, 2021]

### § 1039.105 What smoke opacity standards must my engines meet?

(a) The smoke opacity standards in this section apply to all engines subject to emission standards under this part, except for the following engines:

- (1) Single-cylinder engines.
- (2) Constant-speed engines.

(3) Engines certified to a PM emission standard or FEL of 0.07 g/kW-hr or lower.

(b) Measure smoke opacity as specified in § 1039.501(c). Smoke opacity from your engines may not exceed the following standards:

- (1) 20 percent during the acceleration mode.
- (2) 15 percent during the lugging mode.

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

[69 FR 39213, June 29, 2004, as amended at 88 FR 4658, Jan. 24, 2023]

### § 1039.107 What evaporative emission standards and requirements apply?

There are no evaporative emission standards for diesel-fueled engines, or engines using other nonvolatile or non-liquid fuels (for example, natural gas). If your engine uses a volatile liquid fuel, such as methanol, you must meet the evaporative emission requirements of 40 CFR part 1048 that apply to spark-ignition engines, as follows:

(a) Follow the steps in 40 CFR 1048.245 to show that you meet the requirements of 40 CFR 1048.105.

(b) Do the following things in your application for certification:

(1) Describe how your engines control evaporative emissions.

(2) Present test data to show that equipment using your engines meets the evaporative emission standards we specify in this section if you do not use design-based certification under 40 CFR 1048.245.

[69 FR 39213, June 29, 2004, as amended at 81 FR 74134, Oct. 25, 2016]

### § 1039.110 Recording reductant use and other diagnostic functions.

(a) Engines equipped with SCR systems using a reductant other than the engine's fuel must have a diagnostic system that monitors reductant quality and tank levels and alert operators to the need to refill the reductant tank before it is empty, or to replace the reductant if it does not meet your concentration specifications. Unless we approve other alerts, use a warning lamp or an audible alarm. You do not need to separately monitor reductant quality if your system uses input from an exhaust  $\text{NO}_x$  sensor (or other sensor) to alert operators when reductant quality is inadequate. However, tank level must be monitored in all cases.

(b) You may equip your engine with other diagnostic features. If you do, they must be designed to allow us to read and interpret the codes. Note that § 1039.205 requires you to provide us any information needed to read, record, and interpret all the information broadcast

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by an engine's onboard computers and electronic control units.

[81 FR 74134, Oct. 25, 2016]

### § 1039.115 What other requirements apply?

Engines that are required to meet the emission standards of this part must meet the following requirements, except as noted elsewhere in this part:

(a) *Crankcase emissions.* Crankcase emissions may not be discharged directly into the ambient atmosphere from any engine throughout its useful life, except as follows:

(1) Engines may discharge crankcase emissions to the ambient atmosphere if the emissions are added to the exhaust emissions (either physically or mathematically) during all emission testing.

(2) If you take advantage of this exception, you must do the following things:

(i) Manufacture the engines so that all crankcase emissions can be routed into the applicable sampling systems specified in 40 CFR part 1065.

(ii) Account for deterioration in crankcase emissions when determining exhaust deterioration factors.

(3) For purposes of this paragraph (a), crankcase emissions that are routed to the exhaust upstream of exhaust aftertreatment during all operation are not considered to be discharged directly into the ambient atmosphere.

(b)–(d) [Reserved]

(e) *Adjustable parameters.* Engines that have adjustable parameters must meet all the requirements of this part for any adjustment in the practically adjustable range. We may require that you set adjustable parameters to any specification within the practically adjustable range during any testing, including certification testing, selective enforcement auditing, or in-use testing. General provisions for adjustable parameters apply as specified in 40 CFR 1068.50.

(f) *Prohibited controls.* (1) *General provisions.* 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, an engine may not emit a noxious or toxic substance it would otherwise not emit

that contributes to such an unreasonable risk.

(2) *Vanadium sublimation in SCR catalysts.* For engines equipped with vanadium-based SCR catalysts, you must design the engine and its emission controls to prevent vanadium sublimation and protect the catalyst from high temperatures. We will evaluate your engine design based on the following information that you must include in your application for certification:

(i) Identify the threshold temperature for vanadium sublimation for your specified SCR catalyst formulation as described in 40 CFR 1065.1113 through 1065.1121.

(ii) Describe how you designed your engine to prevent catalyst inlet temperatures from exceeding the temperature you identify in paragraph (f)(2)(i) of this section, including consideration of engine wear through the useful life. Also describe your design for catalyst protection in case catalyst temperatures exceed the specified temperature. In your description, include how you considered elevated catalyst temperature resulting from sustained high-load engine operation, catalyst exotherms, DPF regeneration, and component failure resulting in unburned fuel in the exhaust stream.

(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 that the engine may reasonably be expected 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 the applicable test procedures described in subpart F of this part.

(2) You show your design is necessary to prevent engine (or equipment) damage or accidents.

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

(4) The auxiliary emission control device applies only for engines that will be installed in emergency equipment and the need is justified in terms of preventing the equipment from losing

speed or power due to abnormal conditions of the emission control system, or in terms of preventing such abnormal conditions from occurring, during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, and running out of diesel exhaust fluid for engines that rely on urea-based selective catalytic reduction. The emission standards do not apply when any AECs approved under this paragraph (g)(4) are active.

(5) The auxiliary emission control device operates only in emergency situations as defined in § 1039.665 and meets all of the requirements of that section, and you meet all of the requirements of that section.

[69 FR 39213, June 29, 2004, as amended at 72 FR 53130, Sept. 18, 2007; 77 FR 34147, June 8, 2012; 88 FR 4659, Jan. 24, 2023]

#### § 1039.120 What emission-related warranty requirements apply to me?

(a) *General requirements.* You must warrant to the ultimate purchaser and each subsequent purchaser that the new nonroad engine, including all parts of its emission-control system, meets two conditions:

If your engine is certified as . . .	And its maximum power is . . .	And its rated speed is . . .	Then its warranty period is . . .
Variable speed or constant speed.	kW <19 .....	Any speed .....	1,500 hours or two years, whichever comes first.
Constant speed .....	19 ≤ kW <37 .....	3,000 rpm or higher .....	1,500 hours or two years, whichever comes first.
Constant speed .....	19 ≤ kW <37 .....	Less than 3,000 rpm .....	3,000 hours or five years, whichever comes first.
Variable speed .....	19 ≤ kW <37 .....	Any speed .....	3,000 hours or five years, whichever comes first.
Variable speed or constant speed.	kW ≥ 37 .....	Any speed .....	3,000 hours or five years, whichever comes first.

(c) *Components covered.* The emission-related warranty covers all components whose failure would increase an engine's emissions of any regulated pollutant, including components listed in 40 CFR part 1068, appendix I, and components from any other system you develop to control emissions. The emission-related warranty covers these components even if another company produces the component. Your emission-related warranty does not need to cover components whose failure would

(1) It is designed, built, and equipped so it conforms at the time of sale to the ultimate purchaser 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 as long as the minimum warranty periods listed in this paragraph (b) in hours of operation and years, whichever comes first. You may offer an emission-related warranty more generous than we require. The emission-related warranty for the engine may not be shorter than any basic mechanical warranty you provide without charge for the engine. Similarly, the emission-related warranty for any component may not be shorter than any warranty you provide without charge for that component. This means that your warranty may not treat emission-related and nonemission-related defects differently for any component. If an engine has no hour meter, we base the warranty periods in this paragraph (b) only on the engine's age (in years). The warranty period begins when the engine is placed into service. The minimum warranty periods are shown in the following table:

not increase an engine's emissions of any regulated pollutant.

(d) *Limited applicability.* You may deny warranty claims under this section if the operator caused the problem through improper maintenance or use, as described in 40 CFR 1068.115.

(e) *Owners manual.* Describe in the owners manual the emission-related

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warranty provisions from this section that apply to the engine.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 75 FR 22989, Apr. 30, 2010; 81 FR 74134, Oct. 25, 2016]

### § 1039.125 What maintenance instructions must I give to buyers?

Give the ultimate purchaser 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 emission-data engines, as described in § 1039.245 and in 40 CFR part 1065.

(a) *Critical emission-related maintenance.* Critical emission-related maintenance includes any adjustment, cleaning, repair, or replacement of critical emission-related components. This may also include additional emission-related maintenance that you determine is critical if we approve it in advance. You may schedule critical emission-related maintenance on these components if you meet the following conditions:

(1) You demonstrate that the maintenance is reasonably likely to be done at the recommended intervals on in-use engines. We will accept scheduled maintenance as reasonably likely to occur if you satisfy any of the following conditions, with the exception that paragraphs (a)(1)(ii) and (iii) of this section do not apply for DEF replenishment:

(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 at least 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 your maintenance instructions.

(iv) You otherwise show us that the maintenance is reasonably likely to be done at the recommended intervals.

(2) For engines below 130 kW, you may not schedule critical emission-related maintenance more frequently than the following minimum intervals, except as specified in paragraphs (a)(4), (b), and (c) of this section:

(i) For EGR-related filters and coolers, DEF filters, crankcase ventilation valves and filters, and fuel injector tips (cleaning only), the minimum interval is 1,500 hours.

(ii) For the following components, including associated sensors and actuators, the minimum interval is 3,000 hours: Fuel injectors, turbochargers, catalytic converters, electronic control units, EGR systems (including related components, but excluding filters and coolers), and other add-on components.

(iii) For SCR systems, the minimum interval for replenishing the diesel exhaust fluid (DEF) is the number of engine operating hours necessary to consume a full tank of fuel based on normal usage starting from full fuel capacity for the equipment. Use good engineering judgment to ensure that equipment manufacturers will meet this requirement for worst-case operation by following your installation instructions. For example, if your highest rate of DEF consumption (relative to fuel consumption) will occur under a steady state operating conditions characterized by one of the modes of the applicable steady-state certification test (to the extent that continuous operation at such mode is representative of real-world conditions), the DEF tank should be large enough that a single tank of DEF would be enough to continue proper operation of the SCR system for the expected operating range with a single tank of fuel at that mode. For engine testing in a laboratory, any size DEF tank and fuel tank may be used; however, for our testing of engines, we may require you to provide us with a production-type DEF tank, including any associated sensors.

(3) For engines at or above 130 kW, you may not schedule critical emission-related maintenance more frequently than the following minimum intervals, except as specified in paragraphs (a)(4), (b), and (c) of this section:

(i) For EGR-related filters and coolers, DEF filters, crankcase ventilation valves and filters, and fuel injector tips (cleaning only), the minimum interval is 1,500 hours.

(ii) For the following components, including associated sensors and actuators, the minimum interval is 4,500

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hours: Fuel injectors, turbochargers, catalytic converters, electronic control units, EGR systems (including related components, but excluding filters and coolers), and other add-on components.

(iii) The provisions of paragraph (a)(2)(iii) of this section apply for SCR systems.

(4) For particulate traps, trap oxidizers, and components related to either of these, scheduled maintenance may include cleaning or repair at the intervals specified in paragraph (a)(2)(ii) or (a)(3)(ii) of this section, as applicable. Scheduled maintenance may include a shorter interval for cleaning or repair and may also include adjustment or replacement, but only if we approve it. We will approve your request if you provide the maintenance free of charge and clearly state this in your maintenance instructions, and you provide us additional information as needed to convince us that the maintenance will occur.

(5) You may ask us to approve a maintenance interval shorter than that specified in paragraphs (a)(2) and (3) of this section under § 1039.210, including emission-related components that were not in widespread use with nonroad compression-ignition engines before 2011. In your request you must describe the proposed maintenance step, recommend the maximum feasible interval for this maintenance, include your rationale with supporting evidence to support the need for the maintenance at the recommended interval, and demonstrate that the maintenance will be done at the recommended interval on in-use engines. In considering your request, we will evaluate the information you provide and any other available information to establish alternate specifications for maintenance intervals, if appropriate. We will announce any decision we make under this paragraph (a)(5) in the FEDERAL REGISTER. Anyone may request a hearing regarding such a decision (see § 1039.820).

(6) If your engine family has an alternate useful life under § 1039.101(g) that is shorter than the period specified in paragraph (a)(2) or (a)(3) of this section, you may not schedule critical emission-related maintenance more frequently than the alternate useful

life, except as specified in paragraph (c) of this section.

(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 state clearly 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 those engines from in-use testing or deny a warranty claim. Do not take these maintenance steps during service accumulation on your emission-data engines.

(c) *Special maintenance.* You may specify more frequent maintenance to address problems related to special situations, such as atypical engine operation. You must clearly state that this additional maintenance is associated with the special situation you are addressing. You may also address maintenance of low-use engines (such as recreational or stand-by engines) by specifying the maintenance interval in terms of calendar months or years in addition to your specifications in terms of engine operating hours. All special maintenance instructions must be consistent with good engineering judgment. We may disapprove your maintenance instructions if we determine that you have specified special maintenance steps to address maintenance that is unlikely to occur in use, or engine operation that is not atypical. For example, this paragraph (c) does not allow you to design engines that require special maintenance for a certain type of expected operation. If we determine that certain maintenance items do not qualify as special maintenance under this paragraph (c), you may identify this as recommended additional maintenance under paragraph (b) of this section.

(d) *Noncritical emission-related maintenance.* Subject to the provisions of this paragraph (d), you may schedule any amount of emission-related inspection or maintenance that is not covered by paragraph (a) of this section (that is, maintenance that is neither explicitly identified as critical emission-related

maintenance, nor that we approve as critical emission-related maintenance). Noncritical emission-related maintenance generally includes maintenance on the components we specify in 40 CFR part 1068, appendix I, that is not covered in paragraph (a) of this section. You must state in the owners manual that these steps are not necessary to keep the emission-related warranty valid. If operators fail to do this maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim. Do not take these inspection or maintenance steps during service accumulation on your emission-data 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 emission-data engines, as long as they are reasonable and technologically necessary. This might include adding engine oil, changing air, fuel, or oil filters, servicing engine-cooling systems or fuel-water separator cartridges or elements, and adjusting idle speed, governor, engine bolt torque, valve lash, or injector lash. You may not perform this non-emission-related maintenance on emission-data engines more often than the least frequent intervals that you recommend to the ultimate purchaser.

(f) *Source of parts and repairs.* State clearly in your written maintenance instructions that a repair shop or person of the owner's choosing 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 engine 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.

(g) *Payment for scheduled maintenance.* Owners are responsible for properly maintaining their engines. This generally includes paying for scheduled maintenance. However, manufacturers must pay for scheduled maintenance during the useful life if the regulations require it or if it meets all the following criteria:

(1) Each affected component was not in general use on similar engines before the applicable dates shown in paragraph (6) of the definition of *new nonroad engine* in §1039.801.

(2) The primary function of each affected component is to reduce emissions.

(3) The cost of the scheduled maintenance is more than 2 percent of the price of the engine.

(4) Failure to perform the maintenance would not cause clear problems that would significantly degrade the engine's performance.

(h) *Owners manual.* Explain the owner's responsibility for proper maintenance in the owners manual.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 72 FR 53130, Sept. 18, 2007; 73 FR 59191, Oct. 8, 2008; 75 FR 22989, Apr. 30, 2010; 79 FR 46373, Aug. 8, 2014; 81 FR 74134, Oct. 25, 2016]

**§ 1039.130 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 engine installer instructions for installing it consistent with the requirements of this part. Include all information necessary to ensure that an engine will be installed in its certified configuration.

(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 the instructions needed to properly install the exhaust system and any other components. Include instructions consistent with the requirements of § 1039.205(u). Also describe how to properly size the DEF tank consistent with the specifications in § 1039.125(a), if applicable.

(4) Describe any necessary steps for installing the diagnostic system described in § 1039.110.

(5) Describe how your certification is limited for any type of application. For example, if your engines are certified only for constant-speed operation, tell equipment manufacturers not to install the engines in variable-speed applications.

(6) Describe any other instructions to make sure the installed engine will operate according to design specifications in your application for certification. This may include, for example, instructions for installing aftertreatment devices when installing the engines.

(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 equipment, as described in 40 CFR 1068.105.”.

(8) Describe equipment-labeling requirements consistent with § 1039.135. State whether you are providing the label for the fuel inlet or the equipment manufacturer must provide the label.

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

(d) Provide instructions in writing or in an equivalent format. For example, you may post instructions on a publicly available website for downloading or printing. If you do not provide the instructions in writing, explain in your application for certification how you will ensure that each installer is informed of the installation requirements.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 79 FR 46373, Aug. 8, 2014; 81 FR 74134, Oct. 25, 2016]

### § 1039.135 How must I label and identify the engines I produce?

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

(b) At the time of manufacture, affix a permanent and legible label identifying each engine. The label must meet the requirements of 40 CFR 1068.45.

(c) The label must—

(1) Include the heading “EMISSION CONTROL INFORMATION”.

(2) Include your full corporate name and trademark. You may identify another company and use its trademark instead of yours if you comply with the branding provisions of 40 CFR 1068.45.

(3) Include EPA’s standardized designation for the engine family (and subfamily, where applicable).

(4) State the power category or subcategory from § 1039.101 or § 1039.102 that determines the applicable emission standards for the engine family. For engines at or above 37 kW and below 56 kW from model years 2008 through 2012, and for engines less than 8 kW utilizing the provision at § 1039.101(c), you must state the applicable PM standard for the engine family.

(5) State the engine’s displacement (in liters); however, you may omit this from the label if all the engines in the engine family have the same per-cylinder displacement and total displacement.

(6) State the date of manufacture [DAY (optional), MONTH, and YEAR]; however, you may omit this from the label if you stamp, engrave, or otherwise permanently identify it elsewhere on the engine, in which case you must also describe in your application for certification where you will identify the date on the engine.

(7) State the FELs to which the engines are certified if certification depends on the ABT provisions of subpart H of this part.

(8) Identify the emission-control system. Use terms and abbreviations as described in 40 CFR 1068.45. You may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(9) For diesel-fueled engines, unless otherwise specified in § 1039.104(e)(2),



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state: “ULTRA LOW SULFUR FUEL ONLY”.

(10) Identify any additional requirements for fuel and lubricants that do not involve fuel-sulfur levels. You may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(11) State the useful life for your engine family if we approve a shortened useful life under § 1039.101(g)(2).

(12) State: “THIS ENGINE COMPLIES WITH U.S. EPA REGULATIONS FOR [MODEL YEAR] NONROAD DIESEL ENGINES.”.

(13) For engines above 560 kW, include the following things:

(i) For engines certified to the emission standards for generator-set engines, add the phrase “FOR GENERATOR SETS AND OTHER APPLICATIONS”.

(ii) For all other engines, add the phrase “NOT FOR USE IN A GENERATOR SET”.

(14) If your engines are certified only for constant-speed operation, state “USE IN CONSTANT-SPEED APPLICATIONS ONLY”.

(15) For engines with one or more approved auxiliary emission control devices for emergency equipment applications under § 1039.115(g)(4), the statement: “THIS ENGINE IS FOR INSTALLATION IN EMERGENCY EQUIPMENT ONLY.” Note that this label requirement does not apply for engines that include emergency AECs under § 1039.665 rather than § 1039.115(g)(4).

(d) You may add information to the emission control information label as follows:

(1) You may identify other emission standards that the engine meets or does not meet (such as international standards), as long as this does not cause you to omit any of the information described in paragraphs (c)(5) through (10) of this section. You may add the information about the other emission standards to the statement we specify, or you may include it in a separate statement.

(2) You may add other information to ensure that the engine will be properly maintained and used.

(3) You may add appropriate features to prevent counterfeit labels. For ex-

ample, you may include the engine’s unique identification number on the label.

(e) For model year 2019 and earlier, create a separate label with the statement: “ULTRA LOW SULFUR FUEL ONLY”. Permanently attach this label to the equipment near the fuel inlet or, if you do not manufacture the equipment, take one of the following steps to ensure that the equipment will be properly labeled:

(1) Provide the label to the equipment manufacturer and include the appropriate information in the emission-related installation instructions.

(2) Confirm that the equipment manufacturers install their own complying labels.

(f) You may ask us to approve modified labeling requirements in this part 1039 if you show that it is necessary or appropriate. We will approve your request if your alternate label is consistent with the requirements of this part.

(g) If you obscure the engine label while installing the engine in the equipment such that the label cannot be read during normal maintenance, you must place a duplicate label on the equipment. If others install your engine in their equipment in a way that obscures the engine label, we require them to add a duplicate label on the equipment (see 40 CFR 1068.105); in that case, give them the number of duplicate labels they request and keep the following records for at least five years:

(1) Written documentation of the request from the equipment manufacturer.

(2) The number of duplicate labels you send for each engine family and the date you sent them.

[69 FR 39213, June 29, 2004, as amended at 72 FR 53130, Sept. 18, 2007; 73 FR 59191, Oct. 8, 2008; 75 FR 22989, Apr. 30, 2010; 77 FR 34147, June 8, 2012; 79 FR 46373, Aug. 8, 2014; 81 FR 74135, Oct. 25, 2016; 86 FR 34504, June 29, 2021]

### § 1039.140 What is my engine’s maximum engine power?

(a) An engine configuration’s maximum engine power is the maximum brake power point on the nominal power curve for the engine configuration, as defined in this section. Round

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the power value to the nearest whole kilowatt.

(b) The nominal power curve of an engine configuration is the relationship between maximum available engine brake power and engine speed for an engine, using the mapping procedures of 40 CFR part 1065, based on the manufacturer's design and production specifications for the engine. This information may also be expressed by a torque curve that relates maximum available engine torque with engine speed.

(c) The nominal power curve must be within the range of the actual power curves of production engines considering normal production variability. If after production begins it is determined that your nominal power curve does not represent production engines, we may require you to amend your application for certification under §1039.225.

(d) Throughout this part, references to a specific power value or a range of power values for an engine are based on maximum engine power. For example, the group of engines with maximum engine power above 560 kW may be referred to as engines above 560 kW.

### Subpart C—Certifying Engine Families

#### § 1039.201 What are the general requirements for obtaining a certificate of conformity?

(a) You must send us a separate application for a certificate of conformity for each engine family. A certificate of conformity is valid for new production from the indicated effective date until the end of the model year for which it is issued, which may not extend beyond December 31 of that year. No new certificate will be issued after December 31 of the model year. You may amend your application for certification after the end of the model year in certain circumstances as described in §§1039.220 and 1039.225. You must renew your certification annually for any engines you continue to produce.

(b) The application must contain all the information required by this part and must not include false or incom-

plete statements or information (see §1039.255).

(c) We may ask you to include less information than we specify in this subpart, as long as you maintain all the information required by §1039.250.

(d) You must 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.

(f) See §1039.255 for provisions describing how we will process your application.

(g) We may require you to deliver your test engines to a facility we designate for our testing (see §1039.235(c)). Alternatively, you may choose to deliver another engine that is identical in all material respects to the test engine, or another engine that we determine can appropriately serve as an emission-data engine for the engine family.

(h) For engines that become new after being placed into service, such as engines converted to nonroad use after being used in motor vehicles, we may specify alternate certification provisions consistent with the intent of this part. See the definition of "new nonroad engine" in §1039.801.

[69 FR 39213, June 29, 2004, as amended at 75 FR 22990, Apr. 30, 2010; 81 FR 74135, Oct. 25, 2016]

#### § 1039.205 What must I include in my application?

This section specifies the information that must be in your application, unless we ask you to include less information under §1039.201(c). We may require you to provide additional information to evaluate your application.

(a) Describe the engine family's specifications and other basic parameters of the engine's design and emission controls. List the fuel type on which your engines are designed to operate (for example, ultra low-sulfur diesel fuel). List each distinguishable engine configuration in the engine family. For each engine configuration, list the maximum engine power and the range of values for maximum engine power resulting from production tolerances, as described in §1039.140.

(b) Explain how the emission-control system operates. Describe in detail all

system components for controlling exhaust emissions, including all auxiliary-emission control devices (AECDs) and all fuel-system components you will install on any production or test engine. Identify the part number of each component you describe. For this paragraph (b), treat as separate AECDs any devices that modulate or activate differently from each other. Include all the following:

- (1) Give a general overview of the engine, the emission-control strategies, and all AECDs.
- (2) Describe each AECD's general purpose and function.
- (3) Identify the parameters that each AECD senses (including measuring, estimating, calculating, or empirically deriving the values). Include equipment-based parameters and state whether you simulate them during testing with the applicable procedures.
- (4) Describe the purpose for sensing each parameter.
- (5) Identify the location of each sensor the AECD uses.
- (6) Identify the threshold values for the sensed parameters that activate the AECD.
- (7) Describe the parameters that the AECD modulates (controls) in response to any sensed parameters, including the range of modulation for each parameter, the relationship between the sensed parameters and the controlled parameters and how the modulation achieves the AECD's stated purpose. Use graphs and tables, as necessary.
- (8) Describe each AECD's specific calibration details. This may be in the form of data tables, graphical representations, or some other description.
- (9) Describe the hierarchy among the AECDs when multiple AECDs sense or modulate the same parameter. Describe whether the strategies interact in a comparative or additive manner and identify which AECD takes precedence in responding, if applicable.
- (10) Explain the extent to which the AECD is included in the applicable test procedures specified in subpart F of this part.
- (11) Do the following additional things for AECDs designed to protect engines or equipment:
  - (i) Identify the engine and/or equipment design limits that make protec-

tion necessary and describe any damage that would occur without the AECD.

(ii) Describe how each sensed parameter relates to the protected components' design limits or those operating conditions that cause the need for protection.

(iii) Describe the relationship between the design limits/parameters being protected and the parameters sensed or calculated as surrogates for those design limits/parameters, if applicable.

(iv) Describe how the modulation by the AECD prevents engines and/or equipment from exceeding design limits.

(v) Explain why it is necessary to estimate any parameters instead of measuring them directly and describe how the AECD calculates the estimated value, if applicable.

(vi) Describe how you calibrate the AECD modulation to activate only during conditions related to the stated need to protect components and only as needed to sufficiently protect those components in a way that minimizes the emission impact.

(c) If your engines are equipped with an engine diagnostic system as required under §1039.110, explain how it works, describing especially the engine conditions (with the corresponding diagnostic trouble codes) that cause the warning lamp to go on and the design features that minimize the potential for operation without reductant. Also identify the communication protocol (SAE J1939, SAE J1979, etc.)

(d) Describe the engines you selected for testing and the reasons for selecting them.

(e) Describe the test equipment and procedures that you used, including any special or alternate test procedures you used (see §1039.501).

(f) Describe how you operated the emission-data engine before testing, including the duty cycle and the number of engine operating hours used to stabilize emission levels. Explain why you selected the method of service accumulation. Describe any scheduled maintenance you did.

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(g) List the specifications of the test fuel to show that it falls within the required ranges we specify in 40 CFR part 1065.

(h) Identify the engine family's useful life.

(i) Include the maintenance instructions you will give to the ultimate purchaser of each new nonroad engine (see § 1039.125).

(j) Include the emission-related installation instructions you will provide if someone else installs your engines in a piece of nonroad equipment (see § 1039.130).

(k) Describe your emission control information label (see § 1039.135).

(l) Identify the emission standards or FELs to which you are certifying engines in the engine family. Identify the ambient operating regions that will apply for NTE testing under § 1039.101(e)(4).

(m) Identify the engine family's deterioration factors and describe how you developed them (see § 1039.245). Present any emission test data you used for this.

(n) State that you operated your emission-data engines as described in the application (including the test procedures, test parameters, and test fuels) to show you meet the requirements of this part.

(o) Present emission data for hydrocarbons (such as NMHC or THCE, as applicable), NO<sub>x</sub>, PM, and CO on an emission-data engine to show your engines meet the applicable duty-cycle emission standards we specify in § 1039.101. Show emission figures before and after applying adjustment factors for regeneration and deterioration factors for each engine. Include emission results for each mode if you do discrete-mode testing under § 1039.505. Present emission data to show that you meet any applicable smoke standards we specify in § 1039.105. If we specify more than one grade of any fuel type (for example, high-sulfur and low-sulfur diesel fuel), you need to submit test data only for one grade, unless the regulations of this part specify otherwise for your engine. Note that § 1039.235 allows you to submit an application in certain cases without new emission data.

(p) State that all the engines in the engine family comply with the not-to-exceed emission standards we specify in subpart B of this part for all normal operation and use when tested as specified in § 1039.515. Describe any relevant testing, engineering analysis, or other information in sufficient detail to support your statement.

(q) For engines above 560 kW, include information showing how your emission controls will function during normal in-use transient operation. For example, this might include the following:

(1) Emission data from transient testing of engines using measurement systems designed for measuring in-use emissions.

(2) Comparison of the engine design for controlling transient emissions with that from engines for which you have emission data over the transient duty cycle for certification.

(3) Detailed descriptions of control algorithms and other design parameters for controlling transient emissions.

(r) Report test results as follows:

(1) Report all valid test results involving measurement of pollutants for which emission standards apply. Also indicate whether there are test results from invalid tests or from any other tests of the emission-data engine, whether or not they were conducted according to the test procedures of subpart F of this part. We may require you to report these additional test results. We may ask you to send other information to confirm that your tests were valid under the requirements of this part and 40 CFR part 1065.

(2) Report measured CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub> as described in § 1039.235. Small-volume engine manufacturers may omit reporting N<sub>2</sub>O and CH<sub>4</sub>.

(s) Describe all adjustable operating parameters (see § 1039.115(e)), including production tolerances. For any operating parameters that do not qualify as adjustable parameters, include a description supporting your conclusion (see 40 CFR 1068.50(c)). Include the following in your description of each adjustable parameter:

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(1) For practically adjustable parameters, include the nominal or recommended setting, the intended practically adjustable range, and the limits or stops used to limit adjustable ranges. State that the limits, stops, or other means of inhibiting adjustment are effective in preventing adjustment of parameters on in-use engines to settings outside your intended practically adjustable ranges.

(2) For programmable operating parameters, state that you have restricted access to electronic controls to prevent parameter adjustments on in-use engines that would allow operation outside the practically adjustable range. Describe how your engines are designed to prevent unauthorized adjustments.

(t) Provide the information to read, record, and interpret all the information broadcast by an engine's onboard computers and electronic control units. State that, upon request, you will give us any hardware, software, or tools we would need to do this. If you broadcast a surrogate parameter for torque values, you must provide us what we need to convert these into torque units. You may reference any appropriate publicly released standards that define conventions for these messages and parameters. Format your information consistent with publicly released standards.

(u) Confirm that your emission-related installation instructions specify how to ensure that sampling of exhaust emissions will be possible after engines are installed in equipment and placed in service. If this cannot be done by simply adding a 20-centimeter extension to the exhaust pipe, show how to sample exhaust emissions in a way that prevents diluting the exhaust sample with ambient air.

(v) State whether your certification is intended to include engines used in stationary applications. State whether your certification is limited for certain engines. If this is the case, describe how you will prevent use of these engines in applications for which they are not certified. This applies for engines such as the following:

(1) Constant-speed engines.

(2) Engines used for transportation refrigeration units that you certify under the provisions of §1039.645.

(3) Hand-startable engines certified under the provisions of §1039.101(c).

(4) Engines above 560 kW that are not certified to emission standards for generator-set engines.

(w) Unconditionally certify that all the engines in the engine family comply with the requirements of this part, other referenced parts of the CFR, and the Clean Air Act.

(x) Include good-faith estimates of U.S.-directed production volumes. Include a justification for the estimated production volumes if they are substantially different than actual production volumes in earlier years for similar models.

(y) Include the information required by other subparts of this part. For example, include the information required by §1039.725 if you participate in the ABT program.

(z) Include other applicable information, such as information specified in this part or 40 CFR part 1068 related to requests for exemptions.

(aa) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

(bb) For imported engines or equipment, identify the following:

(1) Describe your normal practice for importing engines. For example, this may include identifying the names and addresses of any agents you have authorized to import your engines.

(2) For engines below 560 kW, identify a test facility in the United States where you can test your engines if we select them for testing under a selective enforcement audit, as specified in 40 CFR part 1068, subpart E.

[69 FR 39213, June 29, 2004, as amended at 71 FR 39185, July 11, 2006; 72 FR 53131, Sept. 18, 2007; 74 FR 56508, Oct. 30, 2009; 81 FR 74135, Oct. 25, 2016; 86 FR 34504, June 29, 2021; 88 FR 4659, Jan. 24, 2023]

**§ 1039.210 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, especially for questions related to engine family definitions, auxiliary emission-control devices, deterioration factors, testing for service accumulation, maintenance, and NTE deficiencies and carve-outs. Decisions made under this section are considered to be preliminary approval, subject to final review and approval. We will generally not reverse a decision where we have given you preliminary approval, unless we find new information supporting a different decision. If you request preliminary approval related to the upcoming model year or the model year after that, we will make best-efforts to make the appropriate determinations as soon as practicable. We will generally not provide preliminary approval related to a future model year more than two years ahead of time.

[72 FR 53131, Sept. 18, 2007]

**§ 1039.220 How do I amend my maintenance instructions?**

You may amend your emission-related maintenance instructions after you submit your application for certification as long as the amended instructions remain consistent with the provisions of § 1039.125. You must send the Designated Compliance Officer a written 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. If operators follow the original maintenance instructions rather than the newly specified maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim.

(a) If you are decreasing or eliminating any specified maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. This would generally include replacing one maintenance step with another. We may ap-

prove a shorter time or waive this requirement.

(b) If your requested change would not decrease the specified maintenance, you may distribute the new maintenance instructions anytime after you send your request. For example, this paragraph (b) would cover adding instructions to increase the frequency of filter changes for engines in severe-duty applications.

(c) You need not request approval if you are making only minor corrections (such as correcting typographical mistakes), clarifying your maintenance instructions, or changing instructions for maintenance unrelated to emission control. We may ask you to send us copies of maintenance instructions revised under this paragraph (c).

[75 FR 22990, Apr. 30, 2010; 81 FR 74135, Oct. 25, 2016]

**§ 1039.225 How do I amend my application for certification?**

Before we issue you a certificate of conformity, you may amend your application to include new or modified engine configurations, subject to the provisions of this section. After we have issued your certificate of conformity, you may send us an amended application requesting that we include new or modified engine configurations within the scope of the certificate, subject to the provisions of this section. You must amend your application if any changes occur with respect to any information that is included or should be included in your application.

(a) You must amend your application before you take any of the following actions:

(1) Add an engine configuration to an engine family. In this case, the engine configuration added must be consistent with other engine configurations in the engine family with respect to the criteria listed in § 1039.230.

(2) Change an engine configuration already included in an engine family in a way that may affect emissions, or change any of the components you described in your application for certification. This includes production and design changes that may affect emissions any time during the engine's lifetime.

(3) Modify an FEL for an engine family as described in paragraph (f) of this section.

(b) To amend your application for certification, send the relevant information to the Designated Compliance Officer.

(1) Describe in detail the addition or change in the engine model or configuration you intend to make.

(2) Include engineering evaluations or data showing that the amended engine family complies with all applicable requirements. You may do this by showing that the original emission-data engine is still appropriate for showing that the amended family complies with all applicable requirements.

(3) If the original emission-data engine for the engine family is not appropriate to show compliance for the new or modified engine configuration, include new test data showing that the new or modified engine configuration meets the requirements of this part.

(4) Include any other information needed to make your application correct and complete.

(c) We may ask for more test data or engineering evaluations. You must give us these within 30 days after we request them.

(d) For engine families already covered by a certificate of conformity, we will determine whether the existing certificate of conformity covers your newly added or modified engine. You may ask for a hearing if we deny your request (see § 1039.820).

(e) For engine families already covered by a certificate of conformity, you may start producing the new or modified engine configuration anytime after you send us your amended application and before we make a decision under paragraph (d) of this section. However, if we determine that the affected engines do not meet applicable requirements, we will notify you to cease production of the engines and may require you to recall the engines at no expense to the owner. Choosing to produce engines under this paragraph (e) is deemed to be consent to recall all engines that we determine do not meet applicable emission standards or other requirements and to remedy the non-conformity at no expense to the owner. If you do not provide information re-

quired under paragraph (c) of this section within 30 days after we request it, you must stop producing the new or modified engines.

(f) You may ask us to approve a change to your FEL in certain cases after the start of production. The changed FEL may not apply to engines you have already introduced into U.S. commerce, except as described in this paragraph (f). If we approve a changed FEL after the start of production, you must include the new FEL on the emission control information label for all engines produced after the change. You may ask us to approve a change to your FEL in the following cases:

(1) You may ask to raise your FEL for your engine family at any time. In your request, you must show that you will still be able to meet the emission standards as specified in subparts B and H of this part. If you amend your application by submitting new test data to include a newly added or modified engine, as described in paragraph (b)(3) of this section, use the appropriate FELs with corresponding production volumes to calculate emission credits for the model year, as described in subpart H of this part. In all other circumstances, you must use the higher FEL for the entire engine family to calculate emission credits under subpart H of this part.

(2) You may ask to lower the FEL for your engine family only if you have test data from production engines showing that emissions are below the proposed lower FEL. The lower FEL applies only to engines you produce after we approve the new FEL. Use the appropriate FELs with corresponding production volumes to calculate emission credits for the model year, as described in subpart H of this part.

(g) You may produce engines as described in your amended application for certification and consider those engines to be in a certified configuration if we approve a new or modified engine configuration during the model year under paragraph (d) of this section. Similarly, you may modify in-use engines as described in your amended application for certification and consider those engines to be in a certified configuration if we approve a new or modified engine configuration at any time

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under paragraph (d) of this section. Modifying a new or in-use engine to be in a certified configuration does not violate the tampering prohibition of 40 CFR 1068.101(b)(1), as long as this does not involve changing to a certified configuration with a higher family emission limit.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 72 FR 53131, Sept. 18, 2007; 75 FR 22990, Apr. 30, 2010; 81 FR 74135, Oct. 25, 2016]

### § 1039.230 How do I select engine families?

(a) For purposes of certification, divide your product line into families of engines that are expected to have similar emission characteristics throughout the useful life as described in this section. 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 the following aspects:

(1) The combustion cycle and fuel. However, you do not need to separate dual-fuel and flexible-fuel engines into separate engine families.

(2) The cooling system (water-cooled vs. air-cooled).

(3) Method of air aspiration.

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

(5) Combustion chamber design.

(6) Bore and stroke.

(7) Cylinder arrangement (such as in-line vs. vee configurations). This applies for engines with aftertreatment devices only.

(8) Method of control for engine operation other than governing (*i.e.*, mechanical or electronic).

(9) Power category.

(10) Numerical level of the emission standards that apply to the engine.

(c) You may subdivide a group of engines that is identical under paragraph (b) of this section into different engine families if you show the expected emission characteristics are different during the useful life.

(d) In unusual circumstances, you may group engines that are not identical with respect to the things listed in paragraph (b) of this section in the same engine family if you show that

their emission characteristics during the useful life will be similar.

(e) If you combine engines from different power categories into a single engine family under paragraph (d) of this section, you must certify the engine family to the more stringent set of standards from the two power categories in that model year.

[69 FR 39213, June 29, 2004, as amended at 72 FR 53131, Sept. 18, 2007; 75 FR 22990, Apr. 30, 2010; 81 FR 74135, Oct. 25, 2016]

### § 1039.235 What testing requirements apply for certification?

This section describes the emission testing you must perform to show compliance with the emission standards in § 1039.101(a) and (b) or § 1039.102(a) and (b). See § 1039.205(p) regarding emission testing related to the NTE standards. See § 1039.240, § 1039.245, and 40 CFR part 1065, subpart E, regarding service accumulation before emission testing.

(a) Select an emission-data engine from each engine family for testing. Select the engine configuration with the highest volume of fuel injected per cylinder per combustion cycle at the point of maximum torque—unless good engineering judgment indicates that a different engine configuration is more likely to exceed (or have emissions nearer to) an applicable emission standard or FEL. If two or more engines have the same fueling rate at maximum torque, select the one with the highest fueling rate at rated speed. In making this selection, consider all factors expected to affect emission-control performance and compliance with the standards, including emission levels of all exhaust constituents, especially NO<sub>x</sub> and PM.

(b) Test your emission-data engines using the procedures and equipment specified in subpart F of this part. In the case of dual-fuel engines, measure emissions when operating with each type of fuel for which you intend to certify the engine. In the case of flexible-fuel engines, measure emissions when operating with the fuel mixture that best represents in-use operation or is most likely to have the highest NO<sub>x</sub> emissions (or NO<sub>x</sub>+NMHC emissions for engines subject to NO<sub>x</sub>+NMHC standards), though you may ask us instead



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to perform tests with both fuels separately if you can show that intermediate mixtures are not likely to occur in use.

(c) We may perform confirmatory testing by measuring emissions from any of your emission-data engines or other engines from the engine family, as follows:

(1) We may decide to do the testing at your plant or any other facility. If we do this, you must deliver the engine to a test facility we designate. The engine you provide must include appropriate manifolds, aftertreatment devices, electronic control units, and other emission-related components not normally attached directly to the engine block. If we do the testing at your plant, you must schedule it as soon as possible and make available the instruments, personnel, and equipment we need.

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

(3) Before we test one of your engines, we may set its adjustable parameters to any point within the physically adjustable ranges (see § 1039.115(e)).

(4) Before we test one of your engines, we may calibrate it within normal production tolerances for anything we do not consider an adjustable parameter. For example, this would apply for an engine parameter that is subject to production variability because it is adjustable during production, but is not considered an adjustable parameter (as defined in § 1039.801) because it is permanently sealed. For parameters that relate to a level of performance that is itself subject to a specified range (such as maximum power output), we will generally perform any calibration under this paragraph (c)(4) in a way that keeps performance within the specified range.

(d) You may ask to use carryover emission data from a previous model year instead of doing new tests, but only if all the following are true:

(1) The engine family from the previous model year differs from the current engine family only with respect to model year, items identified in § 1039.225(a), or other characteristics unrelated to emissions. We may waive this criterion for differences we determine not to be relevant.

(2) The emission-data engine from the previous model year remains the appropriate emission-data engine under paragraph (b) of this section.

(3) The data show that the emission-data engine would meet all the requirements that apply to the engine family covered by the application for certification.

(e) We may require you to test a second engine of the same or different configuration in addition to the engine tested under paragraph (b) of this section.

(f) If you use an alternate test procedure under 40 CFR 1065.10 and later testing shows that such testing does not produce results that are equivalent to the procedures specified in subpart F of this part, we may reject data you generated using the alternate procedure.

(g) Measure CO<sub>2</sub> and CH<sub>4</sub> with each low-hour certification test using the procedures specified in 40 CFR part 1065 in the 2011 and 2012 model years, respectively. Also measure N<sub>2</sub>O with each low-hour certification test using the procedures specified in 40 CFR part 1065 starting in the 2013 model year for any engine family that depends on NO<sub>x</sub> aftertreatment to meet emission standards. Small-volume engine manufacturers may omit measurement of N<sub>2</sub>O and CH<sub>4</sub>. These measurements are not required for NTE testing. Use the same units and modal calculations as for your other results to report a single weighted value for each constituent. Round the final values as follows:

(1) Round CO<sub>2</sub> to the nearest 1 g/kW-hr.

(2) Round N<sub>2</sub>O to the nearest 0.001 g/kW-hr.

(3) Round CH<sub>4</sub> to the nearest 0.001g/kW-hr.

[69 FR 39213, June 29, 2004, as amended at 72 FR 53131, Sept. 18, 2007; 74 FR 56509, Oct. 30, 2009; 75 FR 22991, Apr. 30, 2010; 81 FR 74135, Oct. 25, 2016]

**§ 1039.240 How do I demonstrate that my engine family complies with exhaust emission standards?**

(a) For purposes of certification, your engine family is considered in compliance with the emission standards in § 1039.101(a) and (b), § 1039.102(a) and (b), § 1039.104, and § 1039.105 if all emission-data engines representing that family have test results showing official emission results and deteriorated emission levels at or below these standards. This also applies for all test points for emission-data engines within the family used to establish deterioration factors. Note that your FELs are considered to be the applicable emission standards with which you must comply if you participate in the ABT program in subpart H of this part.

(b) Your engine family is deemed not to comply if any emission-data engine representing that family has test results showing an official emission result or a deteriorated emission level for any pollutant that is above an applicable emission standard. Similarly, your engine family is deemed not to comply if any emission-data engine representing that family has test results showing any emission level above the applicable not-to-exceed emission standard for any pollutant. This also applies for all test points for emission-data engines within the family used to establish deterioration factors.

(c) To compare emission levels from the emission-data engine with the applicable emission standards, apply deterioration factors to the measured emission levels for each pollutant. Section 1039.245 specifies how to test your engine to develop deterioration factors that represent the deterioration expected in emissions over your engines' full useful life. Your deterioration factors must take into account any available data from in-use testing with similar engines. Small-volume engine manufacturers may use assigned deterioration factors that we establish. Apply deterioration factors as follows:

(1) *Additive deterioration factor for exhaust emissions.* Except as specified in paragraph (c)(2) of this section, use an additive deterioration factor for exhaust emissions. An additive deterioration factor is the difference between exhaust emissions at the end of the

useful life and exhaust emissions at the low-hour test point. In these cases, 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. Additive deterioration factors must be specified to one more decimal place than the applicable standard.

(2) *Multiplicative deterioration factor for exhaust emissions.* Use a multiplicative deterioration factor if good engineering judgment calls for the deterioration factor for a pollutant to be the ratio of exhaust emissions at the end of the useful life to exhaust emissions at the low-hour test point. For example, if you use aftertreatment technology that controls emissions of a pollutant proportionally to engine-out emissions, it is often appropriate to use a multiplicative deterioration factor. 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. A multiplicative deterioration factor may not be appropriate in cases where testing variability is significantly greater than engine-to-engine variability. Multiplicative deterioration factors must be specified to one more significant figure than the applicable standard.

(3) *Sawtooth and other nonlinear deterioration patterns.* The deterioration factors described in paragraphs (c)(1) and (2) of this section assume that the highest useful life emissions occur either at the end of useful life or at the low-hour test point. The provisions of this paragraph (c)(3) apply where good engineering judgment indicates that the highest emissions over the useful life will occur between these two points. For example, emissions may increase with service accumulation until a certain maintenance step is performed, then return to the low-hour emission levels and begin increasing again. Base deterioration factors for engines with such emission patterns on the difference between (or ratio of) the point at which the highest emissions occur and the low-hour test point. Note that this applies for maintenance-related deterioration only where we

allow such critical emission-related maintenance.

(4) *Deterioration factor for smoke.* Deterioration factors for smoke are always additive, as described in paragraph (c)(1) of this section.

(5) *Deterioration factor for crankcase emissions.* If your engine vents crankcase emissions to the exhaust or to the atmosphere, you must account for crankcase emission deterioration, using good engineering judgment. You may use separate deterioration factors for crankcase emissions of each pollutant (either multiplicative or additive) or include the effects in combined deterioration factors that include exhaust and crankcase emissions together for each pollutant.

(6) *Dual-fuel and flexible-fuel engines.* In the case of dual-fuel and flexible-fuel engines, apply deterioration factors separately for each fuel type. You may accumulate service hours on a single emission-data engine using the type of fuel or the fuel mixture expected to have the highest combustion and exhaust temperatures; you may ask us to approve a different fuel mixture if you demonstrate that a different criterion is more appropriate.

(d) Determine the official emission result for each pollutant to at least one more decimal place than the applicable standard. Apply the deterioration factor to the official emission result, as described in paragraph (c) of this section, then round the adjusted figure to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each emission-data engine. In the case of NO<sub>x</sub>+NMHC standards, apply the deterioration factor to each pollutant and then add the results before rounding.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 75 FR 22991, Apr. 30, 2010; 81 FR 74136, Oct. 25, 2016]

**§ 1039.245 How do I determine deterioration factors from exhaust durability testing?**

This section describes how to determine deterioration factors, either with an engineering analysis, with pre-existing test data, or with new emission measurements. Apply these deterioration factors to determine whether your

engines will meet the duty-cycle emission standards throughout the useful life as described in §1039.240.

(a) You may ask us to approve deterioration factors for an engine family with established technology based on engineering analysis instead of testing. Engines certified to a NO<sub>x</sub> + NMHC standard or FEL greater than the Tier 3 NO<sub>x</sub> + NMHC standard described in appendix I of this part are considered to rely on established technology for gaseous emission control, except that this does not include any engines that use exhaust-gas recirculation or aftertreatment. In most cases, technologies used to meet the Tier 1 and Tier 2 emission standards would be considered to be established technology.

(b) You may ask us to approve deterioration factors for an engine family based on emission measurements from similar highway or nonroad engines if you have already given us these data for certifying the other engines in the same or earlier model years. Use good engineering judgment to decide whether the two engines are similar. We will approve your request if you show us that the emission measurements from other engines reasonably represent in-use deterioration for the engine family for which you have not yet determined deterioration factors.

(c) If you are unable to determine deterioration factors for an engine family under paragraph (a) or (b) of this section, select engines, subsystems, or components for testing. Determine deterioration factors based on service accumulation and related testing to represent the deterioration expected from in-use engines over the full useful life. You must measure emissions from the emission-data engine at least three times with evenly spaced intervals of service accumulation. You may use extrapolation to determine deterioration factors once you have established a trend of changing emissions with age for each pollutant. You may use an engine installed in nonroad equipment to accumulate service hours instead of running the engine only in the laboratory. You may perform maintenance on emission-data engines as described in §1039.125 and 40 CFR part 1065, subpart E. Use good engineering judgment for

all aspects of the effort to establish deterioration factors under this paragraph (c).

(d) Include the following information in your application for certification:

(1) If you use test data from a different engine family, explain why this is appropriate and include all the emission measurements on which you base the deterioration factor.

(2) If you determine your deterioration factors based on engineering analysis, explain why this is appropriate and include a statement that all data, analyses, evaluations, and other information you used are available for our review upon request.

(3) If you do testing to determine deterioration factors, describe the form and extent of service accumulation, including a rationale for selecting the service-accumulation period and the method you use to accumulate hours.

(e) You may alternatively determine and verify deterioration factors based on bench-aged aftertreatment as described in 40 CFR 1036.245 and 1036.246, with the following exceptions:

(1) The minimum required aging for engines as specified in 40 CFR 1036.245(c)(2) is 1,500 hours. Operate the engine for service accumulation using the same sequence of duty cycles that would apply for determining a deterioration factor under paragraph (c) of this section.

(2) Use good engineering judgment to perform verification testing using the procedures of §1039.515 rather than 40 CFR 1036.555. For PEMS testing, measure emissions as the equipment goes through its normal operation over the course of the day (or shift-day).

(3) Apply infrequent regeneration adjustment factors as specified in §1039.525 rather than 40 CFR 1036.580.

[69 FR 39213, June 29, 2004, as amended at 72 FR 53131, Sept. 18, 2007; 75 FR 22991, Apr. 30, 2010; 86 FR 34505, June 29, 2021; 88 FR 4659, Jan. 24, 2023]

#### **§1039.250 What records must I keep and what reports must I send to EPA?**

(a) Within 45 days after the end of the model year, send the Designated Compliance Officer a report describing the following information about engines you produced during the model year:

(1) Report the total number of engines you produced in each engine family by maximum engine power, total displacement, and the type of fuel system.

(2) If you produced exempted engines under the provisions of §1039.625, report the number of exempted engines you produced for each engine model and identify the buyer or shipping destination for each exempted engine.

(b) Organize and maintain the following records:

(1) A copy of all applications and any summary information you send us.

(2) Any of the information we specify in §1039.205 that you were not required to include in your application.

(3) A detailed history of each emission-data engine. For each engine, describe all of the following:

(i) The emission-data 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 the components you include in your application for certification.

(ii) How you accumulated engine operating hours (service accumulation), 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 the date and purpose of each test and documentation of test parameters as specified in part 40 CFR part 1065.

(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.

(4) Production figures for each engine family divided by assembly plant.

(5) Keep a list of engine identification numbers for all the engines you produce under each certificate of conformity.

(c) Keep required data from emission tests and all other information specified in this section for eight years after we issue your certificate. If you use the same emission data or other information for a later model year, the eight-year period restarts with each year

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that you continue to rely on the information.

(d) 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. You must keep these records readily available. We may review them at any time.

[69 FR 39213, June 29, 2004, as amended at 75 FR 22991, Apr. 30, 2010; 81 FR 74136, Oct. 25, 2016]

### § 1039.255 What decisions may EPA make regarding a certificate of conformity?

(a) If we determine an 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 the engine family for that model year. We may make the approval subject to additional conditions.

(b) We may deny an application for certification if we determine that an engine family fails to comply with emission standards or other requirements of this part or the Clean Air Act. We will base our decision on all available information. If we deny an application, we will explain why in writing.

(c) In addition, we may deny your application or suspend or revoke a certificate of conformity if you do any of the following:

(1) Refuse to comply with any testing or reporting requirements in this part.

(2) Submit false or incomplete information. This includes doing anything after submitting an application that causes submitted information to be false or incomplete.

(3) Cause any test data to become inaccurate.

(4) Deny us from completing authorized activities (see 40 CFR 1068.20). This includes a failure to provide reasonable assistance.

(5) Produce engines for importation into the United States at a location where local law prohibits us from carrying out authorized activities.

(6) Fail to supply requested information or amend an application to include all engines being produced.

(7) Take any action that otherwise circumvents the intent of the Act or this part.

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(d) We may void a certificate of conformity if you fail to keep records, send reports, or give us information as required under this part or the Act. Note that these are also violations of 40 CFR 1068.101(a)(2).

(e) We may void a certificate of conformity if we find that you intentionally submitted false or incomplete information. This includes doing anything after submitting an application that causes submitted information to be false or incomplete.

(f) If we deny an application or suspend, revoke, or void a certificate, you may ask for a hearing (see § 1039.820).

[86 FR 34505, June 29, 2021]

### Subpart D [Reserved]

### Subpart E—In-Use Testing

#### § 1039.401 General provisions.

We may perform in-use testing of any engine subject to the standards of this part. However, we will limit recall testing to the first 75 percent of each engine's useful life as specified in § 1039.101(g).

### Subpart F—Test Procedures

#### § 1039.501 How do I run a valid emission test?

(a) Use the equipment and procedures for compression-ignition engines in 40 CFR part 1065 to determine whether engines meet the duty-cycle emission standards in subpart B of this part. Measure the emissions of all the exhaust constituents subject to emission standards as specified in 40 CFR part 1065. Measure CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub> as described in § 1039.235. Use the applicable duty cycles specified in §§ 1039.505 and 1039.510.

(b) Section 1039.515 describes the supplemental procedures for evaluating whether engines meet the not-to-exceed emission standards in subpart B of this part.

(c) Measure smoke opacity using the procedures in 40 CFR part 1065, subpart L, for evaluating whether engines meet the smoke opacity standards in § 1039.105, except that you may test two-cylinder engines with an exhaust

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muffler like those installed on in-use engines.

(d) Use the fuels specified in § 1039.104(e) and 40 CFR part 1065 to perform valid tests.

(1) For service accumulation, use the test fuel or any commercially available fuel that is representative of the fuel that in-use engines will use.

(2) For diesel-fueled engines, use the appropriate diesel fuel specified in 40 CFR part 1065 for emission testing. Unless we specify otherwise, the appropriate diesel test fuel is the ultra low-sulfur diesel fuel. If we allow you to use a test fuel with higher sulfur levels, identify the test fuel in your application for certification and ensure that the emission control information label is consistent with your selection of the test fuel (see § 1039.135(c)(9)). For example, do not test with ultra low-sulfur diesel fuel if you intend to label your engines to allow use of diesel fuel with sulfur concentrations up to 500 ppm.

(e) The following provisions apply for engines using aftertreatment technology with infrequent regeneration events that may occur during testing:

(1) Adjust measured emissions to account for aftertreatment technology with infrequent regeneration as described in § 1039.525.

(2) If your engine family includes engines with one or more emergency AECDs approved under § 1039.115(g)(4) or (5), do not consider additional regenerations resulting from those AECDs when developing adjustments to measured values under this paragraph (e).

(3) Invalidate a smoke test if active regeneration starts to occur during the test.

(f) You may disable any AECDs that have been approved solely for emergency equipment applications under § 1039.115(g)(4). Note that the emission standards do not apply when any of these AECDs are active.

(g) You may use special or alternate procedures to the extent we allow them under 40 CFR 1065.10.

(h) This subpart is addressed to you as a manufacturer, but it applies equally to anyone who does testing for you, and to us when we perform testing to

determine if your engines meet emission standards.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 72 FR 53132, Sept. 18, 2007; 74 FR 56509, Oct. 30, 2009; 77 FR 34147, June 8, 2012; 79 FR 46373, Aug. 8, 2014; 81 FR 74137, Oct. 25, 2016; 88 FR 4659, Jan. 24, 2023]

### **§ 1039.505 How do I test engines using steady-state duty cycles, including ramped-modal testing?**

This section describes how to test engines under steady-state conditions. In some cases, we allow you to choose the appropriate steady-state duty cycle for an engine; you may also choose between discrete-mode and ramped-modal testing. In all cases, you must use the duty cycle you select in your application for certification for all testing you perform for that engine family. If we test your engines to confirm that they meet emission standards, we will use the duty cycle you select for your own testing. If you submit certification test data using more than one duty cycle, any of the selected duty cycles may be used for any subsequent testing. We may also perform other testing as allowed by the Clean Air Act.

(a) You may perform steady-state testing with either discrete-mode or ramped-modal cycles as described in 40 CFR part 1065.

(b) Measure emissions by testing the engine on a dynamometer with one of the following duty cycles to determine whether it meets the steady-state emission standards in § 1039.101(b):

(1) Use the 5-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (a) of Appendix II of this part for constant-speed engines. Note that these cycles do not apply to all engines used in constant-speed applications, as described in § 1039.801.

(2) Use the 6-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (b) of Appendix II of this part for variable-speed engines below 19 kW. You may instead use the 8-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (c) of Appendix II of this part if some engines from your engine family will be used in applications that do not involve governing to maintain engine operation around rated speed.

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(3) Use the 8-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (c) of Appendix II of this part for variable-speed engines at or above 19 kW.

(c) For constant-speed engines whose design prevents full-load operation for extended periods, you may ask for approval under 40 CFR 1065.10(c) to replace full-load operation with the maximum load for which the engine is designed to operate for extended periods.

(d) To allow non-motoring dynamometers on cycles with idle, you may omit additional points from the duty-cycle regression as follows:

(1) For variable-speed engines with low-speed governors, you may omit speed, torque, and power points from the duty-cycle regression statistics if the following are met:

(i) The engine operator demand is at its minimum.

(ii) The dynamometer demand is at its minimum.

(iii) It is an idle point  $f_{nref} = 0\%$  (idle) and  $T_{ref} = 0\%$  (idle).

(iv)  $T_{ref} < T \leq 5\% \cdot T_{maxmapped}$ .

(2) For variable-speed engines without low-speed governors, you may omit torque and power points from the duty-

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cycle regression statistics if the following are met:

(i) The dynamometer demand is at its minimum.

(ii) It is an idle point  $f_{nref} = 0\%$  (idle) and  $T_{ref} = 0\%$  (idle).

(iii)  $f_{nref} - (2\% \cdot f_{ntest}) < f_n < f_{nref} + (2\% \cdot f_{ntest})$ .

(iv)  $T_{ref} < T \leq 5\% \cdot T_{maxmapped}$ .

[79 FR 23750, Apr. 28, 2014, as amended at 81 FR 74137, Oct. 25, 2016]

### § 1039.510 Which duty cycles do I use for transient testing?

(a) Measure emissions by testing the engine on a dynamometer with one of the following transient duty cycles to determine whether it meets the transient emission standards in §1039.101(a):

(1) For variable-speed engines, use the transient duty cycle described in appendix VI of this part.

(2) [Reserved]

(b) The transient test sequence consists of an initial run through the transient duty cycle from a cold start, 20 minutes with no engine operation, then a final run through the same transient duty cycle. Calculate the official transient emission result from the following equation:

$$\text{Official transient emission result} = \frac{0.05 \cdot \text{cold-start emissions (g)} + 0.95 \cdot \text{hot-start emissions (g)}}{0.05 \cdot \text{cold-start work (kW} \cdot \text{hr)} + 0.95 \cdot \text{hot-start work (kW} \cdot \text{hr)}}$$

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 75 FR 22991, Apr. 30, 2010; 76 FR 57437, Sept. 15, 2011; 79 FR 23751, Apr. 28, 2014]

### § 1039.515 What are the test procedures related to not-to-exceed standards?

(a) *General provisions.* The provisions in 40 CFR 86.1370 apply for determining whether an engine meets the not-to-exceed emission standards in §1039.101(e), except as noted in this section. Interpret references to vehicles and vehicle operation to mean equipment and equipment operation.

(b) *Special PM zone.* For engines certified to a PM standard or FEL above 0.07 g/kW-hr, a modified NTE control area applies for PM emissions only. The speeds and loads to be excluded are

determined based on speeds B and C, determined according to the provisions of 40 CFR 86.1360–2007(c). One of the following provisions applies:

(1) If the C speed is below 2400 rpm, exclude the speed and load points to the right of or below the line formed by connecting the following two points on a plot of speed-vs.-power:

(i) 30% of maximum power at the B speed; however, use the power value corresponding to the engine operation at 30% of maximum torque at the B speed if this is greater than 30% of maximum power at the B speed.

(ii) 70% of maximum power at 100% speed.

(2) If the C speed is at or above 2400 rpm, exclude the speed and load points to the right of the line formed by connecting the two points in paragraphs

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(b)(2)(i) and (ii) of this section (the 30% and 50% torque/power points) and below the line formed by connecting the two points in paragraphs (b)(2)(ii) and (iii) of this section (the 50% and 70% torque/power points). The 30%, 50%, and 70% torque/power points are defined as follows:

(i) 30% of maximum power at the B speed; however, use the power value corresponding to the engine operation at 30% of maximum torque at the B speed if this is greater than 30% of maximum power at the B speed.

(ii) 50% of maximum power at 2400 rpm.

(iii) 70% of maximum power at 100% speed.

[69 FR 39213, June 29, 2004, as amended at 81 FR 74137, Oct. 25, 2016]

### § 1039.520 What testing must I perform to establish deterioration factors?

Sections 1039.240 and 1039.245 describe the method for testing that must be performed to establish deterioration factors for an engine family.

### § 1039.525 How do I adjust emission levels to account for infrequently regenerating aftertreatment devices?

For engines using aftertreatment technology with infrequent regeneration events that may occur during testing, take one of the following approaches to account for the emission impact of regeneration:

(a) You may use the calculation methodology described in 40 CFR 1065.680 to adjust measured emission results. Do this by developing an upward adjustment factor and a downward adjustment factor for each pollutant based on measured emission data and observed regeneration frequency as follows:

(1) Adjustment factors should generally apply to an entire engine family, but you may develop separate adjustment factors for different configurations within an engine family. Use the adjustment factors from this section for all testing for the engine family.

(2) You may use carryover or carry-across data to establish adjustment factors for an engine family as described in § 1039.235, consistent with good engineering judgment.

(3) For engines that are required to certify to both transient and steady-state duty cycles, calculate a separate adjustment factor for steady-state and transient operation.

(b) You may ask us to approve an alternate methodology to account for regeneration events. We will generally limit approval to cases where your engines use aftertreatment technology with extremely infrequent regeneration and you are unable to apply the provisions of this section.

(c) You may choose to make no adjustments to measured emission results if you determine that regeneration does not significantly affect emission levels for an engine family (or configuration) or if it is not practical to identify when regeneration occurs. If you choose not to make adjustments under paragraph (a) or (b) of this section, your engines must meet emission standards for all testing, without regard to regeneration.

[81 FR 74137, Oct. 25, 2016]

## Subpart G—Special Compliance Provisions

### § 1039.601 What compliance provisions apply?

(a) Engine and equipment manufacturers, as well as owners, operators, and rebuilders of engines subject to the requirements of this part, and all other persons, must observe the provisions of this part, the requirements and prohibitions in 40 CFR part 1068, and the provisions of the Act.

(b) Subpart C of this part describes how to test and certify dual-fuel and flexible-fuel engines. Some multi-fuel engines may not fit either of those defined terms. For such engines, we will determine whether it is most appropriate to treat them as single-fuel engines, dual-fuel engines, or flexible-fuel engines based on the range of possible and expected fuel mixtures. For example, an engine might burn natural gas but initiate combustion with a pilot injection of diesel fuel. If the engine is designed to operate with a single fueling algorithm (*i.e.*, fueling rates are fixed at a given engine speed and load condition), we would generally treat it as a single-fuel engine. In this context,



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the combination of diesel fuel and natural gas would be its own fuel type. If the engine is designed to also operate on diesel fuel alone, we would generally treat it as a dual-fuel engine. If the engine is designed to operate on varying mixtures of the two fuels, we would generally treat it as a flexible-fuel engine. To the extent that requirements vary for the different fuels or fuel mixtures, we may apply the more stringent requirements.

[81 FR 74137, Oct. 25, 2016, as amended at 86 FR 34505, June 29, 2021]

### § 1039.605 What provisions apply to engines certified under the motor-vehicle program?

(a) *General provisions.* If you are an engine manufacturer, this section allows you to introduce new nonroad engines into commerce if they are already certified to the requirements that apply to compression-ignition engines under 40 CFR parts 85 and 86 for the appropriate model year. If you comply with all the provisions of this section, we consider the certificate issued under 40 CFR part 86 for each engine to also be a valid certificate of conformity under this part 1039 for its model year, without a separate application for certification under the requirements of this part 1039. See § 1039.610 for similar provisions that apply to engines certified to chassis-based standards for motor vehicles.

(b) *Equipment-manufacturer provisions.* If you are not an engine manufacturer, you may install motor-vehicle engines certified for the appropriate model year under 40 CFR part 86 in nonroad equipment as long as you meet all the requirements and conditions specified in paragraph (d) of this section. You must also add the fuel-inlet label we specify in § 1039.135(e). If you modify the motor-vehicle engine in any of the ways described in paragraph (d)(2) of this section, we will consider you a manufacturer of a new nonroad engine. Such engine modifications prevent you from using the provisions of this section.

(c) *Liability.* Engines for which you meet the requirements of this section are exempt from all the requirements and prohibitions of this part, except for those specified in this section. Engines

exempted under this section must meet all the applicable requirements from 40 CFR parts 85 and 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. The prohibited acts of 40 CFR 1068.101(a)(1) apply to these new engines and equipment; however, we consider the certificate issued under 40 CFR part 86 for each engine to also be a valid certificate of conformity under this part 1039 for its model year. If we make a determination that these engines do not conform to the regulations during their useful life, we may require you to recall them under 40 CFR part 86 or 40 CFR 1068.505.

(d) *Specific requirements.* If you are an engine manufacturer or equipment manufacturer and meet all the following criteria and requirements regarding your new nonroad engine, the engine is eligible for an exemption under this section:

(1) Your engine must be covered by a valid certificate of conformity issued under 40 CFR part 86.

(2) You must not make any changes to the certified engine that could reasonably be expected to increase its exhaust emissions for any pollutant, or its evaporative emissions if it is subject to evaporative-emission standards. 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 parameters from the certified configuration.

(ii) Change, remove, or fail to properly install any other component, element of design, or calibration specified in the engine manufacturer's application for certification. This includes aftertreatment devices and all 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) You must show that fewer than 50 percent of the engine family's total sales in the United States are used in nonroad applications. This includes engines used in any application without regard to which company manufactures

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the vehicle or equipment. Show this as follows:

(i) If you are the original manufacturer of the engine, base this showing on your sales information.

(ii) In all other cases, you must get the original manufacturer of the engine to confirm this based on its sales information.

(4) You must ensure that the engine has the label we require under 40 CFR part 86.

(5) You must add a permanent supplemental label to the engine in a position where it will remain clearly visible after installation in the equipment. In the supplemental label, do the following:

(i) Include the heading: “NONROAD ENGINE EMISSION CONTROL INFORMATION”.

(ii) Include your full corporate name and trademark. You may identify another company and use its trademark instead of yours if you comply with the branding provisions of 40 CFR 1068.45.

(iii) State: “THIS ENGINE WAS ADAPTED FOR NONROAD USE WITHOUT AFFECTING ITS EMISSION CONTROLS. THE EMISSION-CONTROL SYSTEM DEPENDS ON THE USE OF FUEL MEETING SPECIFICATIONS THAT APPLY FOR MOTOR-VEHICLE APPLICATIONS. OPERATING THE ENGINE ON OTHER FUELS MAY BE A VIOLATION OF FEDERAL LAW.”

(iv) State the date you finished modifying the engine (month and year), if applicable.

(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) You must make sure that nonroad equipment produced under this section will have the fueling label we specify in § 1039.135(c)(9)(i).

(8) Send the Designated Compliance Officer written notification describing your plans before using the provisions of this section. In addition, by February 28 of each calendar year (or less often if we tell you), send the Designated Compliance Officer a signed

letter with all the following information:

(i) Identify your full corporate name, address, and telephone number.

(ii) List the engine or equipment models for which you used this exemption in the previous year and describe your basis for meeting the sales restrictions of paragraph (d)(3) of this section.

(iii) State: “We prepared each listed [engine or equipment] model for nonroad application without making any changes that could increase its certified emission levels, as described in 40 CFR 1039.605.”

(e) *Failure to comply.* If your engines do not meet the criteria listed in paragraph (d) of this section, they will be subject to the standards, requirements, and prohibitions of this part 1039 and the certificate issued under 40 CFR part 86 will not be deemed to also be a certificate issued under this part 1039. Introducing these engines into commerce without a valid exemption or certificate of conformity under this part violates the prohibitions in 40 CFR 1068.101(a)(1).

(f) *Data submission.* We may require you to send us emission test data on any applicable nonroad duty cycles.

(g) *Participation in averaging, banking and trading.* Engines adapted for nonroad use under this section may not generate or use emission credits under this part 1039. These engines may generate credits under the ABT provisions in 40 CFR part 86. These engines must use emission credits under 40 CFR part 86 if they are certified to an FEL that exceeds an applicable standard under 40 CFR part 86.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 72 FR 53132, Sept. 18, 2007; 75 FR 22992, Apr. 30, 2010; 81 FR 74138, Oct. 25, 2016]

### § 1039.610 What provisions apply to vehicles certified under the motor-vehicle program?

(a) *General provisions.* If you are a motor-vehicle manufacturer, this section allows you to introduce new nonroad engines or equipment into commerce if the vehicle is already certified to the requirements that apply under 40 CFR parts 85 and 86 for the appropriate model year. If you comply

with all of the provisions of this section, we consider the certificate issued under 40 CFR part 86 for each motor vehicle to also be a valid certificate of conformity for the engine under this part 1039 for its model year, without a separate application for certification under the requirements of this part 1039. See §1039.605 for similar provisions that apply to motor-vehicle engines produced for nonroad equipment.

(b) *Equipment-manufacturer provisions.* If you are not a motor-vehicle manufacturer, you may produce nonroad equipment from motor vehicles under this section as long as you meet all the requirements and conditions specified in paragraph (d) of this section. You must also add the fuel-inlet label we specify in §1039.135(e). If you modify the motor vehicle or its engine in any of the ways described in paragraph (d)(2) of this section, we will consider you a manufacturer of a new nonroad engine. Such modifications prevent you from using the provisions of this section.

(c) *Liability.* Engines, vehicles, and equipment for which you meet the requirements of this section are exempt from all the requirements and prohibitions of this part, except for those specified in this section. Engines exempted under this section must meet all the applicable requirements from 40 CFR parts 85 and 86. This applies to engine manufacturers, equipment manufacturers, and all other persons as if the nonroad equipment were motor vehicles. The prohibited acts of 40 CFR 1068.101(a)(1) apply to these new pieces of equipment; however, we consider the certificate issued under 40 CFR part 86 for each motor vehicle to also be a valid certificate of conformity for the engine under this part 1039 for its model year. If we make a determination that these engines, vehicles, or equipment do not conform to the regulations during their useful life, we may require you to recall them under 40 CFR part 86 or 40 CFR 1068.505.

(d) *Specific requirements.* If you are a motor-vehicle manufacturer and meet all the following criteria and requirements regarding your new nonroad equipment and its engine, the engine is eligible for an exemption under this section:

(1) Your equipment must be covered by a valid certificate of conformity as a motor vehicle issued under 40 CFR part 86.

(2) You must not make any changes to the certified vehicle that we could reasonably expect to increase its exhaust emissions for any pollutant, or its evaporative emissions if it is subject to evaporative-emission standards. For example, if you make any of the following changes, you do not qualify for this exemption:

(i) Change any fuel system parameters from the certified configuration.

(ii) Change, remove, or fail to properly install any other component, element of design, or calibration specified in the vehicle manufacturer's application for certification. This includes aftertreatment devices and all related components.

(iii) Modify or design the engine cooling system so that temperatures or heat rejection rates are outside the original vehicle manufacturer's specified ranges.

(iv) Add more than 500 pounds to the curb weight of the originally certified motor vehicle.

(3) You must show that fewer than 50 percent of the engine family's total sales in the United States are used in nonroad applications. This includes any type of vehicle, without regard to which company completes the manufacturing of the nonroad equipment. Show this as follows:

(i) If you are the original manufacturer of the vehicle, base this showing on your sales information.

(ii) In all other cases, you must get the original manufacturer of the vehicle to confirm this based on their sales information.

(4) The equipment must have the vehicle emission control information and fuel labels we require under 40 CFR 86.007–35.

(5) You must add a permanent supplemental label to the equipment in a position where it will remain clearly visible. In the supplemental label, do the following:

(i) Include the heading: “NONROAD ENGINE EMISSION CONTROL INFORMATION”.

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(ii) Include your full corporate name and trademark. You may identify another company and use its trademark instead of yours if you comply with the branding provisions of 40 CFR 1068.45.

(iii) State: “THIS VEHICLE WAS ADAPTED FOR NONROAD USE WITHOUT AFFECTING ITS EMISSION CONTROLS. THE EMISSION-CONTROL SYSTEM DEPENDS ON THE USE OF FUEL MEETING SPECIFICATIONS THAT APPLY FOR MOTOR-VEHICLE APPLICATIONS. OPERATING THE ENGINE ON OTHER FUELS MAY BE A VIOLATION OF FEDERAL LAW.”.

(iv) State the date you finished modifying the vehicle (month and year), if applicable.

(6) The original and supplemental labels must be readily visible in the fully assembled equipment.

(7) Send the Designated Compliance Officer written notification describing your plans before using the provisions of this section. In addition, by February 28 of each calendar year (or less often if we tell you), send the Designated Compliance Officer a signed letter with all the following information:

(i) Identify your full corporate name, address, and telephone number.

(ii) List the equipment models for which you used this exemption in the previous year and describe your basis for meeting the sales restrictions of paragraph (d)(3) of this section.

(iii) State: “We prepared each listed engine or equipment model for nonroad application without making any changes that could increase its certified emission levels, as described in 40 CFR 1039.610.”

(e) *Failure to comply.* If your engines, vehicles, or equipment do not meet the criteria listed in paragraph (d) of this section, the engines will be subject to the standards, requirements, and prohibitions of this part 1039, and the certificate issued under 40 CFR part 86 will not be deemed to also be a certificate issued under this part 1039. Introducing these engines into commerce without a valid exemption or certificate of conformity under this part violates the prohibitions in 40 CFR 1068.101(a)(1).

(f) *Data submission.* We may require you to send us emission test data on any applicable nonroad duty cycles.

(g) *Participation in averaging, banking and trading.* Vehicles adapted for nonroad use under this section may not generate or use emission credits under this part 1039. These vehicles may generate credits under the ABT provisions in 40 CFR part 86. These vehicles must be included in the calculation of the applicable fleet average in 40 CFR part 86.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40463, July 13, 2005; 72 FR 53132, Sept. 18, 2007; 75 FR 22992, Apr. 30, 2010; 81 FR 74138, Oct. 25, 2016]

### § 1039.615 What special provisions apply to engines using noncommercial fuels?

In §1039.115(e), we generally require that engines meet emission standards for any adjustment within the full range of any adjustable parameters. For engines that use noncommercial fuels significantly different than the specified test fuel of the same type, you may ask to use the parameter-adjustment provisions of this section instead of those in §1039.115(e). Engines certified under this section must be in a separate engine family.

(a) If we approve your request, the following provisions apply:

(1) You must certify the engine using the test fuel specified in §1039.501.

(2) You may produce the engine without limits or stops that keep the engine adjusted within the certified range.

(3) You must specify in-use adjustments different than the adjustable settings appropriate for the specified test fuel, consistent with the provisions of paragraph (b)(1) of this section.

(b) To produce engines under this section, you must do the following:

(1) Specify in-use adjustments needed so the engine's level of emission control for each regulated pollutant is equivalent to that from the certified configuration.

(2) Add the following information to the emission control information label specified in §1039.135:

(i) Include instructions describing how to adjust the engine to operate in a way that maintains the effectiveness of the emission-control system.

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(ii) State: “THIS ENGINE IS CERTIFIED TO OPERATE IN APPLICATIONS USING NONCOMMERCIAL FUEL. MALADJUSTMENT OF THE ENGINE IS A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.”.

(3) Keep records to document the destinations and quantities of engines produced under this section.

**§ 1039.620 What are the provisions for exempting engines used solely for competition?**

The provisions of this section apply for new engines built on or after January 1, 2006.

(a) Equipment manufacturers may use uncertified engines if the vehicles or equipment in which they are installed will be used solely for competition.

(b) The definition of nonroad engine in 40 CFR 1068.30 excludes engines used solely for competition. These engines are not required to comply with this part, but 40 CFR 1068.101 prohibits the use of competition engines for noncompetition purposes.

(c) We consider a vehicle or piece of equipment to be one that will be used solely for competition if it has features that are not easily removed that would make its use other than in competition unsafe, impractical, or highly unlikely.

(d) As an engine manufacturer, your engine is exempt without our prior approval if you have a written request for an exempted engine from the equipment manufacturer showing the basis for believing that the equipment will be used solely for competition. You must permanently label engines exempted under this section to clearly indicate that they are to be used solely for competition. Failure to properly label an engine will void the exemption.

(e) We may discontinue an exemption under this section if we find that engines are not used solely for competition.

[69 FR 39213, June 29, 2004, as amended at 86 FR 34505, June 29, 2021]

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**§ 1039.625 What requirements apply under the program for equipment-manufacturer flexibility?**

The provisions of this section allow equipment manufacturers to produce equipment with engines that are subject to less stringent emission standards after the Tier 4 emission standards begin to apply. To be eligible to use the provisions of this section, you must follow all the instructions in this section. See § 1039.626 for requirements that apply specifically to companies that manufacture equipment outside the United States and to companies that import such equipment without manufacturing it. Engines and equipment you produce under this section are exempt from the prohibitions in 40 CFR 1068.101(a)(1), subject to the provisions of this section.

(a) *General.* If you are an equipment manufacturer, you may introduce into commerce in the United States limited numbers of nonroad equipment with engines exempted under this section. You may use the exemptions in this section only if you have primary responsibility for designing and manufacturing equipment and your manufacturing procedures include installing some engines in this equipment. Consider all U.S.-directed equipment sales in showing that you meet the requirements of this section, including those from any parent or subsidiary companies and those from any other companies you license to produce equipment for you. If you produce a type of equipment that has more than one engine, count each engine separately. These provisions are available over the following periods:

(1) These provisions are available for the years shown in the following table, except as provided in paragraph (a)(2) of this section:

**TABLE 1 OF § 1039.625—GENERAL AVAILABILITY OF ALLOWANCES**

Power category	Calendar years
kW <19 .....	2008–2014
19 ≤kW <56 .....	2008–2014
56 ≤kW <130 .....	2012–2018
130 ≤kW ≤560 .....	2011–2017
kW >560 .....	2011–2017

(2) If you do not use any allowances in a power category before the earliest

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dates shown in the following table, you may delay the start of the seven-year period for using allowances under this section as follows:

TABLE 2 OF § 1039.625—AVAILABILITY OF  
DELAYED ALLOWANCES

Power category	Calendar years
kW <19 .....	.....
19 ≤kW <56 .....	2012–2018
56 ≤kW <130 .....	2014–2020
130 ≤kW ≤560 .....	2014–2020
kW >560 .....	2015–2021

(b) *Allowances.* You may choose one of the following options for each power category to produce equipment with exempted engines under this section, except as allowed under § 1039.627:

(1) *Percent-of-production allowances.* You may produce a certain number of units with exempted engines calculated using a percentage of your total sales within a power category relative to your total U.S.-directed production volume. The sum of these percentages within a power category during the seven-year period specified in paragraph (a) of this section may not exceed 80 percent, except as allowed under paragraph (b)(2) or (m) of this section.

(2) *Small-volume allowances.* You may determine an alternate allowance for a specific number of exempted engines under this section using one of the following approaches for your U.S.-directed production volumes:

(i) You may produce up to 700 units with exempted engines within a power category during the seven-year period specified in paragraph (a) of this section, with no more than 200 units in any single year within a power category, except as provided in paragraph (m) of this section. Engines within a power category that are exempted under this section must be from a single engine family within a given year.

(ii) For engines below 130 kW, you may produce up to 525 units with exempted engines within a power category during the seven-year period specified in paragraph (a) of this section, with no more than 150 units in any single year within a power category, except as provided in paragraph (m) of this section. For engines at or above 130 kW, you may produce up to

350 units with exempted engines within a power category during the seven-year period, with no more than 100 units in any single year within a power category. Exemptions under this paragraph (b)(2)(ii) may apply to engines from multiple engine families in a given year.

(iii) In each power category at or above 56 kW, you may apply the provisions of paragraph (b)(2)(i) of this section in the first two model years for which Tier 4 standards apply, regardless of the number of engine families you use in your equipment, provided you exceed the single engine family restriction of that paragraph primarily due to production of equipment intended specifically to travel on snow and to commonly operate at more than 9,000 feet above sea level. After the first two Tier 4 model years in a power category, you may continue to apply the provisions of paragraph (b)(2)(i) of this section, subject to the single engine family restriction.

(c) *Percentage calculation.* Calculate for each calendar year the percentage of equipment with exempted engines from your total U.S.-directed production within a power category if you need to show that you meet the percent-of-production allowances in paragraph (b)(1) of this section.

(d) *Inclusion of engines not subject to Tier 4 standards.* The following provisions apply to engines that are not subject to Tier 4 standards:

(1) If you use the provisions of 40 CFR 1068.105(a) to use up your inventories of engines not certified to new emission standards, do not include these units in your count of equipment with exempted engines under paragraph (b) of this section. However, you may include these units in your count of total equipment you produce for the given year for the percentage calculation in paragraph (b)(1) of this section.

(2) If you install engines that are exempted from the Tier 4 standards for any reason, other than for equipment-manufacturer allowances under this section, do not include these units in your count of exempted engines under paragraph (b) of this section. However, you may include these units in your count of total equipment you produce for the given year for the percentage

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calculation in paragraph (b)(1) of this section. For example, if we grant a hardship exemption for the engine manufacturer, you may count these as compliant engines under this section. This paragraph (d)(2) applies only if the engine has a permanent label describing why it is exempted from the Tier 4 standards.

(3) Do not include equipment using model year 2008 or 2009 engines certified under the provisions of § 1039.101(c) in your count of equipment using exempted engines. However, you may include these units in your count of total equipment you produce for the given year for the percentage calculation in paragraph (b)(1) of this section.

(4) You may start using the allowances under this section for engines that are not yet subject to Tier 4 standards, as long as the seven-year period for using allowances under the Tier 2 or Tier 3 program has expired. Table 3 of this section shows the years for which this paragraph (d)(4) applies. To use these early allowances, you must use engines that meet the emission standards described in paragraph (e) of this section. You must also count these units or calculate these percentages as described in paragraph (c) of this section and apply them toward the total number or percentage of equipment with exempted engines we allow for the Tier 4 standards as described in paragraph (b) of this section. The maximum number of cumulative early allowances under this paragraph (d)(4) is 10 percent under the percent-of-production allowance or 100 units under the small-volume allowance. For example, if you produce 5 percent of your equipment with engines between 130 and 560 kW that use allowances under this paragraph (d)(4) in 2009, you may use up to an additional 5 percent of your allowances in 2010. If you use allowances for 5 percent of your equipment in both 2009 and 2010, your 80 percent allowance for 2011–2017 in the 130–560 kW power category decreases to 70 percent. Manufacturers using allowances under this paragraph (d)(4) must comply with the notification and reporting requirements specified in paragraph (g) of this section.

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TABLE 3 OF § 1039.625—YEARS FOR EARLY ALLOWANCES

Maximum engine power	Calendar years
kW <19 .....	2007
19 ≤kW <37 .....	2006–2011
37 ≤kW <56 .....	2011
56 ≤kW <75 .....	2011
75 ≤kW <130 .....	2010–2011
130 ≤kW <225 .....	2010
225 ≤kW <450 .....	2008–2010
450 ≤kW ≤560 .....	2009–2010
kW >560 .....	

(e) *Standards.* If you produce equipment with exempted engines under this section, the engines must meet emission standards specified in this paragraph (e), or more stringent standards. Note that we consider engines to be meeting emission standards even if they are certified with a family emission limit that is higher than the emission standard that would otherwise apply.

(1) If you are using the provisions of paragraph (d)(4) of this section, engines must meet the applicable Tier 1 or Tier 2 emission standards described in appendix I of this part.

(2) If you are using the provisions of paragraph (a)(2) of this section, engines must be identical in all material respects to engines certified under this part 1039 as follows:

Engines in the following power category. . .	Must meet all standards and requirements that applied in the following model year. . .
(i) 19 ≤kW <56 .....	2008 (Option 1, where applicable).
(ii) 56 ≤kW <130 .....	2012 (Phase-out).
(iii) 130 ≤kW ≤560 .....	2011 (Phase-out).
(iv) kW >560 .....	2011.

(3) In all other cases, engines at or above 56 kW and at or below 560 kW must meet the appropriate Tier 3 standards described in appendix I of this part. Engines below 56 kW and engines above 560 kW must meet the appropriate Tier 2 standards described in appendix I of this part.

(f) *Equipment labeling.* You must add a permanent label, written legibly in English, to the engine or another readily visible part of each piece of equipment you produce with exempted engines under this section. This label, which supplements the engine manufacturer's emission control information label, must include at least the following items:

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(1) The label heading “EMISSION CONTROL INFORMATION”.

(2) Your corporate name and trademark.

(3) The calendar year in which the equipment is manufactured.

(4) An e-mail address and phone number to contact for further information, or a Web site that includes this contact information.

(5) The following statement:

THIS EQUIPMENT [or identify the type of equipment] HAS AN ENGINE THAT MEETS U.S. EPA EMISSION STANDARDS UNDER 40 CFR 1039.625.

(g) *Notification and reporting.* You must notify us of your intent to use the provisions of this section and send us an annual report to verify that you are not exceeding the allowances, as follows:

(1) Before you use the provisions of this section, send the Designated Compliance Officer a written notice of your intent, including:

(i) Your company's name and address, and your parent company's name and address, if applicable.

(ii) The name, phone number and e-mail address of a person to contact for more information.

(iii) The calendar years in which you expect to use the exemption provisions of this section.

(iv) The name and address of each company you expect to produce engines for the equipment you manufacture under this section.

(v) Your best estimate of the number of units in each power category you will produce under this section and whether you intend to comply under paragraph (b)(1) or (b)(2) of this section.

(vi) The number of units in each power category you have sold in years for which the Tier 2 and Tier 3 standards apply.

(2) For each year that you use the provisions of this section, send the Designated Compliance Officer a written report by March 31 of the following year. Identify the following things in your report:

(i) The total count of units you sold in the preceding year for each power category, based on actual U.S.-directed production information.

(ii) The percentages of U.S.-directed production that correspond to the number of units in each power category and the cumulative numbers and percentages of units for all the units you have sold under this section for each power category. You may omit the percentage figures if you include in the report a statement that you will not be using the percent-of-production allowances in paragraph (b)(1) of this section.

(iii) The manufacturer of the engine installed in the equipment you produce under this section if this is different than you specified under paragraph (g)(1)(iv) of this section.

(h) *Recordkeeping.* Keep the following records of all equipment with exempted engines you produce under this section for at least five full years after the final year in which allowances are available for each power category:

(1) The model number, serial number, and the date of manufacture for each engine and piece of equipment.

(2) The maximum power of each engine.

(3) The total number or percentage of equipment with exempted engines, as described in paragraph (b) of this section and all documentation supporting your calculation.

(4) The notifications and reports we require under paragraph (g) of this section.

(i) *Enforcement.* Producing more exempted engines or equipment than we allow under this section or installing engines that do not meet the emission standards of paragraph (e) of this section violates the prohibitions in 40 CFR 1068.101(a)(1). You must give us the records we require under this section if we ask for them (*see* 40 CFR 1068.101(a)(2)).

(j) *Provisions for engine manufacturers.* As an engine manufacturer, you may produce exempted engines as needed under 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. Send us an annual report of the engines you produce under this section, as described in §1039.250(a). Exempt engines must meet the emission standards in



paragraph (e) of this section and you must meet all the requirements of 40 CFR 1068.265, except that engines produced under the provisions of paragraph (a)(2) of this section must be identical in all material respects to engines previously certified under this part 1039. If you show under 40 CFR 1068.265(c) that the engines are identical in all material respects to engines that you have previously certified to one or more FELs above the standards specified in paragraph (e) of this section, you must supply sufficient credits for these engines. Calculate these credits under subpart H of this part using the previously certified FELs and the alternate standards. You must meet the labeling requirements in §1039.135, as applicable, with the following exceptions:

(1) Add the following statement instead of the compliance statement in §1039.135(c)(12):

THIS ENGINE MEETS U.S. EPA EMISSION STANDARDS UNDER 40 CFR 1039.625. SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN FOR THE EQUIPMENT FLEXIBILITY PROVISIONS OF 40 CFR 1039.625 MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(2) You may omit the family emission limits if they are below the emission standards.

(k) *Other exemptions.* See 40 CFR 1068.255 for exemptions based on hardship for equipment manufacturers and secondary engine manufacturers.

(l) [Reserved]

(m) *Additional exemptions for technical or engineering hardship.* You may request additional engine allowances under paragraph (b) of this section; however, you may use these extra allowances only for those equipment models for which you, or an affiliated company, do not also produce the engine. Additional allowances under this paragraph (m) must be used within the specified seven-year period. After considering the circumstances, we may permit you to introduce into U.S. commerce equipment with such engines that do not comply with Tier 4 emission standards, as follows:

(1) We may approve additional exemptions if extreme and unusual circumstances that are clearly outside

your control and that could not have been avoided with reasonable discretion have resulted in technical or engineering problems that prevent you from meeting the requirements of this part. You must show that you exercised prudent planning and have taken all reasonable steps to minimize the scope of your request for additional allowances.

(2) To apply for exemptions under this paragraph (m), send the Designated Compliance Officer a written request as soon as possible before you are in violation. In your request, include the following information:

(i) Describe your process for designing equipment.

(ii) Describe how you normally work cooperatively or concurrently with your engine supplier to design products.

(iii) Describe the engineering or technical problems causing you to request the exemption and explain why you have not been able to solve them. Describe the extreme and unusual circumstances that led to these problems and explain how they were unavoidable.

(iv) Describe any information or products you received from your engine supplier related to equipment design—such as written specifications, performance data, or prototype engines—and when you received it.

(v) Compare the design processes of the equipment model for which you need additional exemptions and that for other models for which you do not need additional exemptions. Explain the technical differences that justify your request.

(vi) Describe your efforts to find and use other compliant engines, or otherwise explain why none is available.

(vii) Describe the steps you have taken to minimize the scope of your request.

(viii) Include other relevant information. You must give us other relevant information if we ask for it.

(ix) Estimate the increased percent of production you need for each equipment model covered by your request, as described in paragraph (m)(3) of this section. Estimate the increased number of allowances you need for each

equipment model covered by your request, as described in paragraph (m)(4) of this section.

(3) We may approve your request to increase the allowances under paragraph (b)(1) of this section, subject to the following limitations:

(i) You must use up the allowances under paragraph (b)(1) of this section before using any additional allowances under this paragraph (m).

(ii) The additional allowances under this paragraph (m)(3) may not exceed 200 percent for each power category.

(iii) You may use these additional allowances only for the specific equipment models covered by your request.

(4) We may approve your request to increase the small-volume allowances under paragraph (b)(2) of this section, subject to the following limitations:

(i) You are eligible for additional allowances under this paragraph (m)(4) only if you do not use the provisions of paragraph (m)(3) of this section to obtain additional allowances within a given power category.

(ii) You must use up the allowances under paragraph (b)(2) of this section before using any additional allowances under this paragraph (m).

(iii) The additional allowances under this paragraph (m)(4) may not exceed 2,000 units.

(iv) We may approve additional allowances in the form of waiving the annual limits specified in paragraph (b)(2) of this section instead of or in addition to increasing the total number of allowances under this paragraph (m)(4).

(v) If we increase the total number of allowances, you may use these allowances only for the specific equipment models covered by your request.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40464, July 13, 2005; 72 FR 53133, Sept. 18, 2007; 73 FR 59191, Oct. 8, 2008; 75 FR 68461, Nov. 8, 2010; 78 FR 49966, Aug. 16, 2013; 79 FR 7084, Feb. 6, 2014; 86 FR 34505, June 29, 2021]

**§ 1039.626 What special provisions apply to equipment imported under the equipment-manufacturer flexibility program?**

This section describes requirements that apply to equipment manufacturers using the provisions of § 1039.625 for equipment produced outside the United States. Note that § 1039.625 limits these provisions to equipment manufacturers

that install some engines and have primary responsibility for designing and manufacturing equipment. Companies that import equipment into the United States without meeting these criteria are not eligible for these allowances. Such importers may import equipment with exempted engines only as described in paragraph (b) of this section.

(a) As a foreign equipment manufacturer, you or someone else may import equipment with exempted engines under this section if you comply with the provisions in § 1039.625 and commit to the following:

(1) Give any EPA inspector or auditor complete and immediate access to inspect and audit, as follows:

(i) Inspections and audits may be announced or unannounced.

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

(iii) You must provide access to any location where—

(A) Any nonroad engine, equipment, or vehicle is produced or stored.

(B) Documents related to manufacturer operations are kept.

(C) Equipment, engines, or vehicles are tested or stored for testing.

(iv) You must provide any documents requested by an EPA inspector or auditor that are related to matters covered by the inspections or audit.

(v) EPA inspections and audits may include review and copying of any documents related to demonstrating compliance with the exemptions in § 1039.625.

(vi) EPA inspections and audits may include inspection and evaluation of complete or incomplete equipment, engines, or vehicles, and interviewing employees.

(vii) You must make any of your employees available for interview by the EPA inspector or auditor, on request, within a reasonable time period.

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

(ix) You must provide English-language interpreters to accompany EPA inspectors and auditors, on request.

(2) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any

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action by EPA or otherwise by the United States related to the requirements of this part.

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

(4) The substantive and procedural laws of the United States shall apply to any civil or criminal enforcement action against you or any of your officers or employees related to the provisions of this section.

(5) Provide the notification required by § 1039.625(g). Include in the notice of intent in § 1039.625(g)(1) a commitment to comply with the requirements and obligations of § 1039.625 and this section. This commitment must be signed by the owner or president.

(6) You, your agents, officers, and employees must not seek to detain or to impose civil or criminal remedies against EPA inspectors or auditors, whether EPA employees or EPA contractors, for actions performed within the scope of EPA employment related to the provisions of this section.

(7) By submitting notification of your intent to use the provisions of § 1039.625, producing and exporting for resale to the United States nonroad equipment under this section, or taking other actions to comply with the requirements of this part, you, your agents, officers, and employees, without exception, become subject to the full operation of the administrative and judicial enforcement powers and provisions of the United States as described in 28 U.S.C. 1605(a)(2), without limitation based on sovereign immunity, for conduct that violates the requirements applicable to you under this part 1039—including such conduct that violates 18 U.S.C. 1001, 42 U.S.C. 7413(c)(2), or other applicable provisions of the Clean Air Act—with respect to actions instituted against you and your agents, officers, and employees in any court or other tribunal in the United States.

(8) Any report or other document you submit to us must be in the English language, or include a complete translation in English.

(9) You must post a bond to cover any potential enforcement actions under the Clean Air Act before you or anyone else imports your equipment under this section, as follows:

(i) The value of the bond is based on the per-engine bond values shown in Table 1 of this section and on the highest number of engines in each power category you produce in any single calendar year under the provisions of § 1039.625. For example, if you have projected U.S.-directed production volumes of 100 exempt engines in the 19–56 kW power category and 300 exempt engines in the 56–130 kW power category in 2013, the appropriate bond amount is \$180,000. If your estimated or actual engine imports increase beyond the level appropriate for your current bond payment, you must post additional bond to reflect the increased sales within 90 days after you change your estimate or determine the actual sales. You may not decrease your bond.

(ii) You may meet the bond requirements of this section with any of the following methods:

(A) Get a bond from a third-party surety that is cited in the U.S. Department of Treasury Circular 570, “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies.” Maintain this bond for five years after the applicable allowance period expires, or five years after you use up all the available allowances under § 1039.625, whichever comes first.

(B) Get us to approve a waiver from the bonding requirement if you can show that you meet the asset thresholds described in 40 CFR 1054.690.

(iii) If you forfeit some or all of your bond in an enforcement action, you must post any appropriate bond for continuing importation within 90 days after you forfeit the bond amount.

**TABLE 1 OF § 1039.626—PER-ENGINE BOND VALUES**

For engines with maximum engine power falling in the following ranges . . .	The per-engine bond value is . . .
kW <19 .....	\$150
19 ≤kW <56 .....	300
56 ≤kW <130 .....	500
130 ≤kW <225 .....	1,000
225 ≤kW <450 .....	3,000
kW ≥450 .....	8,000

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(iv) You will forfeit the proceeds of the bond posted under this section if you need to satisfy any U.S. administrative settlement agreement, administrative final order or judicial judgment against you arising from your violation of this chapter, or violation of 18 U.S.C. 1001, 42 U.S.C. 7413(c)(2), or other applicable provisions of the Clean Air Act.

(b) The provisions of this paragraph (b) apply to importers that do not install engines into equipment and do not have primary responsibility for designing and manufacturing equipment. Such importers may import equipment with engines exempted under § 1039.625 only if each engine is exempted under an allowance provided to an equipment manufacturer meeting the requirements of § 1039.625 and this section. You must notify us of your intent to use the provisions of this section and send us an annual report, as follows:

(1) Before you use the provisions of this section, send the Designated Compliance Officer a written notice of your intent, including:

(i) Your company's name and address, and your parent company's name and address, if applicable.

(ii) The name and address of the companies that produce the equipment and engines you will be importing under this section.

(iii) Your best estimate of the number of units in each power category you will import under this section in the upcoming calendar year, broken down by equipment manufacturer and power category.

(iv) The number of units in each power category you have imported in

years for which the Tier 2 and Tier 3 standards apply.

(2) For each year that you use the provisions of this section, send the Designated Compliance Officer a written report by March 31 of the following year. Include in your report the total number of engines you imported under this section in the preceding calendar year, broken down by engine manufacturer and by equipment manufacturer.

[69 FR 39213, June 29, 2004, as amended at 73 FR 59192, Oct. 8, 2008; 86 FR 34506, June 29, 2021]

### § 1039.627 What are the incentives for equipment manufacturers to use cleaner engines?

This section allows equipment manufacturers to generate additional allowances under the provisions of § 1039.625 by producing equipment using engines at or above 19 kW certified to specified levels earlier than otherwise required.

(a) For early-compliant engines to generate offsets for use under this section, the following general provisions apply:

(1) The engine manufacturer must comply with the provisions of § 1039.104(a)(1) for the offset-generating engines.

(2) Engines you install in your equipment after December 31 of the years specified in § 1039.104(a)(1) do not generate allowances under this section, even if the engine manufacturer generated offsets for that engine under § 1039.104(a).

(3) Offset-generating engines must be certified to the following standards under this part 1039:

If the engine's maximum power is . . .	And you install . . .	Certified early to the . . .	You may reduce the number of engines in the same power category that are required to meet the . . .	In later model years by . . .
(i) kW ≥ 19 .....	One engine .....	Emissions standards in § 1039.101	Standards in Tables 2 through 7 of § 1039.102 or in § 1039.101.	One engine.
(ii) 56 ≤ kW < 130 .....	Two engines .....	NO <sub>x</sub> standards in § 1039.102(e)(1), and NMHC standard of 0.19 g/kW-hr, a PM standard of 0.02 g/kW-hr, and a CO standard of 5.0 g/kW-hr.	Standards in Tables 2 through 7 of § 1039.102 or in § 1039.101.	One engine.
(iii) 130 ≤ kW < 560 ...	Two engines .....	NO <sub>x</sub> standards in § 1039.102(e)(2), an NMHC standard of 0.19 g/kW-hr, a PM standard of 0.02 g/kW-hr, and a CO standard of 3.5 g/kW-hr.	Standards in Tables 2 through 7 of § 1039.102 or in § 1039.101.	One engine.

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(b) *Using engine offsets.* (1) You may use engine offsets generated under paragraph (a) of this section to generate additional allowances under § 1039.625, as follows:

(i) For each engine offset, you may increase the number of available allowances under § 1039.625(b) for that power category by one engine for the years indicated.

(ii) For engines in 56–560 kW power categories, you may transfer engine offsets across power categories within this power range. Calculate the number of additional allowances by scaling the number of generated engine offsets according to the ratio of engine power for offset and allowance engines. Make this calculation for all your offset engines for which you will transfer offsets under this paragraph (b)(1)(ii), then round the result to determine the total number of available power-weighted allowances. For example, if you generate engine offsets for 75 500-kW engines, you may generate up to 37,500 kW-engines of power-weighted allowances. You may apply this to 375 100-kW engines or any other combination that totals 37,500 kW-engines.

(2) You may decline to use the offsets. If you decline, the engine manufacturer may use the provisions of § 1039.104(a)(1).

(c) *Limitation on offsets for engines above 560 kW.* For engines above 560 kW, you must track how many engines you install in generator sets and how many you install in other applications under the provisions of this section. Offsets from generator-set engines may be used only for generator-set engines. Offsets from engines for other applications may be used only for other applications besides generator sets.

(d) *Reporting.* When you submit your first annual report under § 1039.625(g), include the following additional information related to the engines you use to generate offsets under this section:

(1) The name of each engine family involved.

(2) The number of engines from each power category.

(3) The maximum engine power of each engine.

(4) For engines above 560 kW, whether you use engines certified to the standards for generator-set engines.

(e) *In-use fuel.* If the engine manufacturer certifies using ultra low-sulfur diesel fuel, you must take steps to ensure that the in-use engines in the family will use diesel fuel with a sulfur concentration no greater than 15 ppm. For example, selling equipment only into applications where the operator commits to a central-fueling facility with ultra low-sulfur diesel fuel throughout its lifetime would meet this requirement.

[69 FR 39213, June 29, 2004, as amended at 75 FR 22992, Apr. 30, 2010]

### § 1039.630 What are the economic hardship provisions for equipment manufacturers?

If you qualify for the economic hardship provisions specified in 40 CFR 1068.255, we may approve your hardship application subject to the following additional conditions:

(a) You must show that you have used up the allowances to produce equipment with exempted engines under § 1039.625.

(b) You may produce equipment under this section for up to 12 months total (or 24 months total for small-volume manufacturers).

### § 1039.635 What are the hardship provisions for engine manufacturers?

If you qualify for the hardship provisions specified in 40 CFR 1068.245, we may approve a period of delayed compliance for up to one model year total (or two model years total for small-volume manufacturers). If you qualify for the hardship provisions specified in 40 CFR 1068.250 for small-volume manufacturers, we may approve a period of delayed compliance for up to two model years total.

### § 1039.645 What special provisions apply to engines used for transportation refrigeration units?

Manufacturers may choose to use the provisions of this section for engines used in transportation refrigeration units (TRUs). The operating restrictions and characteristics in paragraph (f) of this section define engines that are not used in TRUs. All provisions of this part apply for TRU engines, except as specified in this section.

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(a) You may certify engines under this section with the following special provisions:

(1) The engines are not subject to the transient emission standards of subpart B of this part.

(2) The steady-state emission standards in subpart B of this part apply for emissions measured over the steady-state test cycle described in paragraph

(b) of this section instead of the otherwise applicable duty cycle described in § 1039.505.

(b) Measure steady-state emissions using the procedures specified in § 1039.505, except for the duty cycles, as follows:

(1) The following duty cycle applies for discrete-mode testing:

TABLE 1 OF § 1039.645—DISCRETE-MODE CYCLE FOR TRU ENGINES

Mode number	Engine speed <sup>1</sup>	Torque (percent) <sup>2</sup>	Weighting factors
1 .....	Maximum test speed .....	75	0.25
2 .....	Maximum test speed .....	50	0.25
3 .....	Intermediate test speed .....	75	0.25
4 .....	Intermediate test speed .....	50	0.25

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.

<sup>2</sup> The percent torque is relative to the maximum torque at the given engine speed.

(2) The following duty cycle applies for ramped-modal testing:

TABLE 2 OF § 1039.645—RAMPED-MODAL CYCLE FOR TRU ENGINES

RMC mode	Time in mode (seconds)	Engine speed <sup>1</sup>	Torque (percent) <sup>2 3</sup>
1a Steady-state .....	290	Intermediate Speed .....	75.
1b Transition .....	20	Intermediate Speed .....	Linear Transition.
2a Steady-state .....	280	Intermediate Speed .....	50.
2b Transition .....	20	Linear Transition .....	Linear Transition.
3a Steady-state .....	280	Maximum Test Speed .....	75.
3b Transition .....	20	Maximum Test Speed .....	Linear Transition.
4 Steady-state .....	290	Maximum Test Speed .....	50

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.

<sup>2</sup> The percent torque is relative to the maximum torque at the commanded engine speed.

<sup>3</sup> Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode, and simultaneously command a similar linear progression for engine speed if there is a change in speed setting.

(c) Engines certified under this section must be certified in a separate engine family that contains only TRU engines.

(d) You must do the following for each engine certified under this section:

(1) State on the emission control information label: “THIS ENGINE IS CERTIFIED TO OPERATE ONLY IN TRANSPORTATION REFRIGERATION UNITS. INSTALLING OR USING THIS ENGINE IN ANY OTHER APPLICATION MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.”.

(2) State in the emission-related installation instructions all steps necessary to ensure that the engine will

operate only in the modes covered by the test cycle described in this section.

(3) Keep records to document the destinations and quantities of engines produced under this section.

(e) All engines certified under this section must comply with NTE standards, as described in § 1039.101 or § 1039.102 for the applicable model year, except that the NTE standards are not limited with respect to operating speeds and loads. In your application for certification, certify that all the engines in the engine family comply with the not-to-exceed emission standards for all normal operation and use. The deficiency provisions of § 1039.104(d) do not apply to these engines. This paragraph (e) applies whether or not

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the engine would otherwise be subject to NTE standards.

(f) An engine is not considered to be used in a TRU if any of the following is true:

(1) The engine is installed in any equipment other than refrigeration units for railcars, truck trailers, or other freight vehicles.

(2) The engine operates in any mode not covered by the test cycle described in this section, except as follows:

(i) The engine may operate briefly at idle. Note, however, that TRU engines must meet NTE emission standards under any type of operation, including idle, as described in paragraph (e) of this section.

(ii) The engine may have a minimal amount of transitional operation between two allowable modes. As an example, a thirty-second transition period would clearly not be considered minimal.

(iii) The engine as installed may experience up to a 2-percent decrease in load at a given setpoint over any 10-minute period, and up to a 15-percent decrease in load at a given setpoint over any 60-minute period.

(3) The engine is sold in a configuration that allows the engine to operate in any mode not covered by the test cycle described in this section. For example, this section does not apply to an engine sold without a governor limiting operation only to those modes covered by the test cycle described in this section.

(4) The engine is subject to Tier 3 or earlier standards, or phase-out Tier 4 standards.

[69 FR 39213, June 29, 2004, as amended at 73 FR 37241, June 30, 2008]

## § 1039.650 [Reserved]

### § 1039.655 What special provisions apply to engines sold in American Samoa or the Commonwealth of the Northern Mariana Islands?

(a) The prohibitions in 40 CFR 1068.101(a)(1) do not apply to diesel-fueled engines that are intended for use and will be used in American Samoa or the Commonwealth of the Northern Mariana Islands, subject to the following conditions:

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(1) The engine meets the latest applicable emission standards in appendix I of this part.

(2) You meet all the requirements of 40 CFR 1068.265.

(b) If you introduce an engine into U.S. commerce under this section, you must meet the labeling requirements in §1039.135, but add the following statement instead of the compliance statement in §1039.135(c)(12):

THIS ENGINE DOES NOT COMPLY WITH U.S. EPA TIER 4 EMISSION REQUIREMENTS. IMPORTING THIS ENGINE INTO THE UNITED STATES OR ANY TERRITORY OF THE UNITED STATES EXCEPT AMERICAN SAMOA OR THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(c) Introducing into commerce an engine exempted under this section in any state or territory of the United States other than American Samoa or the Commonwealth of the Northern Mariana Islands, throughout its lifetime, violates the prohibitions in 40 CFR 1068.101(a)(1), unless it is exempt under a different provision.

(d) The exemption provisions in this section also applied for engines that were introduced into commerce in Guam before January 1, 2024 if they would otherwise have been subject to Tier 4 standards.

[88 FR 4659, Jan. 24, 2023]

### § 1039.665 Special provisions for use of engines in emergency situations.

This section specifies provisions that allow for temporarily disabling emission controls during qualified emergency situations. For purposes of this section, a qualified emergency situation is one in which the condition of an engine's emission controls poses a significant direct or indirect risk to human life. An example of a direct risk would be an emission control condition that inhibits the performance of an engine being used to rescue a person from a life-threatening situation. An example of an indirect risk would be an emission control condition that inhibits the performance of an engine being used to provide electrical power to a data center that routes "911" emergency response telecommunications.

(a) *Scope.* To facilitate temporarily disabling emission controls during a qualified emergency situation, manufacturers may apply for approval of auxiliary emission control devices (AECDs) under this section. Once activated, an AECD approved under this section may disable any emission controls as necessary to address a qualified emergency situation, subject to the limitations in this section. For the purposes of this section, automatically limiting engine performance to induce an operator to perform emission-related maintenance—such as refilling a DEF tank—is considered an emission control. AECDs approved under this section are not defeat devices, and their proper use during a qualified emergency situation is not prohibited under Clean Air Act section 203 (42 U.S.C. 7522). Manufacturers may apply for AECD approval at any time; however, we encourage manufacturers to obtain preliminary approval before submitting an application for certification. We may allow manufacturers to apply an approved AECD to engines and equipment that have already been placed into service.

(b) *AECD approval criteria.* We will approve an AECD where we determine that the following criteria have been met:

(1) The AECD's design must be consistent with good engineering judgment and the manufacturer must show that the AECD deactivates emission controls only to the extent necessary to address the expected emergency situation.

(2) Manufacturers must discourage improper activation of the AECD by displaying information where it is clearly visible to the equipment operator when the operator is in a position to activate the AECD. Unless we approve alternate language, state the following: "EMERGENCY USE ONLY. SEE OWNERS MANUAL. PENALTIES APPLY FOR MISUSE."

(3) Manufacturers may design and produce their engines with the AECD initially armed to allow operators to activate the AECD one time per engine without any further input or permission from the manufacturer. The AECD may be subsequently reset as specified in paragraph (b)(8) of this section.

(4) Except as allowed by paragraph (b)(3) of this section, AECD activation must require either input of a temporary code, reconfiguration of the engine's electronic control module by a qualified service technician, or an equivalent security feature that is unique to each engine.

(5) The engine controls must be configured to record the total number of AECD activations in that engine's non-volatile electronic memory.

(6) The engine controls must include an operator-activated switch or other element of design to allow the operator to manually deactivate the AECD once a qualified emergency situation has ended. This manual control may include a "confirm-delete" function, as needed, to prevent unintentionally deactivating the AECD. This control may allow for manual reactivation of the AECD provided that the AECD's automatic deactivation limits in paragraph (b)(7) of this section have not yet been reached, but such reactivation by operators would be allowed only under emergency situations. This manual deactivation control must not deactivate operator inducements required by paragraph (b)(9) of this section.

(7) The AECD must automatically deactivate within a cumulative engine run time of 120 hours after the AECD was initially activated (excluding any time the AECD was deactivated). The AECD may be subsequently reset as specified in paragraph (b)(8) of this section. For emission controls that involve a sequence of increasingly severe engine performance limits to induce operators to perform emission-related maintenance, the emission controls may be reset to the initial point of that sequence when the AECD is deactivated.

(8) The manufacturer must ensure that resetting the AECD cannot occur without the manufacturer's specific permission, and that resetting the AECD requires either input of a temporary code, reconfiguration of the engine's electronic control module by a qualified service technician, or an equivalent security feature that is unique to each engine. AECD resets may not occur unless either the manufacturer has evidence that the emergency situation is continuing or the



operator provides the information required in paragraph (e) of this section, in writing or by any other means.

(9) The manufacturer must take appropriate additional steps to induce operators to report AECD activation and request resetting the AECD. We recommend including one or more persistent visible and/or audible alarms that are active from the point when the AECD is activated to the point when it is reset.

(c) *Required information.* Manufacturers producing engines equipped with an AECD approved under this section must communicate at least the following information in writing to the operator:

(1) Instructions for activating, deactivating, and reactivating the AECD; reporting AECD use; and requesting AECD resets.

(2) A warning that federal regulations prohibit activating the emergency AECD for something other than a qualified emergency situation, failing to disable the emergency AECD after a qualified emergency situation ends, and failing to notify the manufacturer and send reports as required under paragraph (e) of this section. The warning must also identify the maximum civil penalty for such violations as described in 40 CFR 1068.101.

(3) Notification that the manufacturer will send the information from the operator's report under paragraph (e) of this section to EPA and that federal regulation separately prohibits submitting false information.

(d) *Resetting AECDs.* The operator (or other person responsible for the engine/equipment) may request resetting the AECD at any time. The manufacturer may reset the AECD only if the manufacturer has evidence that the emergency situation is continuing, or after the operator provides the information required in paragraph (e) of this section, in writing or by any other means.

(e) *Operator reporting of AECD use.* The operator (or other person responsible for the engine/equipment) must send a written report to the manufacturer within 60 calendar days after activating an AECD approved under this section. The report must include the following:

(1) Contact name, mail and email addresses, and telephone number for the responsible company or entity.

(2) A description of the emergency situation, the location of the engine during the emergency, and the contact information for an official who can verify the emergency situation (such as a county sheriff, fire marshal, or hospital administrator).

(3) The reason for AECD activation during the emergency situation, such as the lack of DEF, or the failure of an emission-related sensor when the engine was needed to respond to an emergency situation.

(4) The engine's serial number (or equivalent).

(5) A description of the extent and duration of the engine operation while the AECD was active, including a statement describing whether or not the AECD was manually deactivated after the emergency situation ended.

(f) *Operator failure to report.* If the operator fails to submit the report required by paragraph (e) of this section to the manufacturer within 60 days of activating an AECD approved under this section, the manufacturer, to the extent it has been made aware of the AECD activation, must send written notification to the operator that failure to meet the submission requirements may subject the operator to penalties under 40 CFR 1068.101.

(g) *Prohibited acts.* The following actions by the operator are improper use of the AECD and are prohibited under Clean Air Act section 203 (42 U.S.C. 7522):

(1) Activating the emergency AECD for any use other than a qualified emergency situation where the emission control strategy would curtail engine performance.

(2) Failing to disable the emergency AECD after a qualified emergency situation has ended.

(3) Failing to disable the emergency AECD after the problem causing the emission control strategy to interfere with engine performance has been or can reasonably be fixed.

(4) Failing to provide the information required under paragraph (e) of this section within 60 days of AECD activation.

(h) *Manufacturer reporting to EPA.* Within 90 days after each calendar year, the manufacturer must send an annual report to the Designated Compliance Officer describing the use of AECDs approved under this section. A manufacturer may request an extension if it is impractical to meet this deadline as the result of an emergency situation occurring late in a given calendar year. The annual report must include a description of each emergency situation leading to each AECD activation and copies of the reports submitted by operators (or statements that an operator did not submit a report, to the extent of the manufacturer's knowledge).

(i) *Submissions to EPA.* Notifications and reports submitted to comply with this section are deemed to be submissions to EPA.

(j) *Recordkeeping.* The manufacturer must keep records to document the use of AECDs approved under this section until the end of the calendar year five years after the onset of the relevant emergency situation. We may approve alternate recordkeeping and reporting requirements.

(k) *Anti-circumvention.* We may set other reasonable conditions to ensure that the provisions in this section are not used to circumvent the emission standards of this part.

[79 FR 46373, Aug. 8, 2014]

#### **§ 1039.670 Approval of an emergency equipment field modification (EEFM).**

This section describes how you may implement design changes for emergency equipment that has already been placed into service to ensure that the equipment will perform properly in emergency situations.

(a) You must notify us in writing of your intent to install or distribute an emergency equipment field modification (EEFM). In some cases you may install or distribute an EEFM only with our advance approval, as specified in this section.

(b) Include in your notification a full description of the EEFM and any documentation to support your determination that the EEFM is necessary to prevent the equipment from losing speed, torque, or power due to abnormal

conditions of its emission control system during operation related to emergency response, or to prevent such abnormal conditions from occurring during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, or running out of diesel exhaust fluid (DEF) for engines that rely on urea-based selective catalytic reduction. Your determination must be based on an engineering evaluation or testing or both.

(c) You may need our advance approval for your EEFM, as follows:

(1) Where the proposed EEFM is identical to an AECD we approved under this part for an engine family currently in production, no approval of the proposed EEFM is necessary.

(2) Where the proposed EEFM is for an engine family currently in production but the applicable demonstration is based on an AECD we approved under this part for an engine family no longer in production, you must describe to us how your proposed EEFM differs from the approved AECD. Unless we say otherwise, your proposed EEFM is deemed approved 30 days after you notify us.

(3) If we have not approved an EEFM comparable to the one you are proposing, you must get our approval before installing or distributing it. In this case, we may request additional information to support your determination under paragraph (b) of this section, as follows:

(i) If we request additional information and you do not provide it within 30 days after we ask, we may deem that you have retracted your request for our approval; however, we may extend this deadline for submitting the additional information.

(ii) We will deny your request if we determine that the EEFM is not necessary to prevent the equipment from losing speed, torque, or power due to abnormal conditions of the emission control system during operation related to emergency response, or to prevent such abnormal conditions from occurring during operation related to emergency response.

(iii) Unless we say otherwise, your proposed EEFM is deemed approved 30

days after we acknowledge that you have provided us with all the additional information we have specified.

(4) If your proposed EEFM is deemed to be approved under paragraph (c)(2) or (3) of this section and we find later that your EEFM in fact does not meet the requirements of this section, we may require you to no longer install or distribute it.

[77 FR 34147, June 8, 2012, as amended at 79 FR 46375, Aug. 8, 2014]

**§ 1039.699 Emission standards and certification requirements for auxiliary power units for highway tractors.**

(a) This section describes emission standards and certification requirements for auxiliary power units (APU) installed on highway tractors subject to standards under 40 CFR 1037.106 starting in model year 2024.

(b) You may apply for a certificate of conformity under this section if you manufacture APUs, or if you install emission control hardware to meet the standard in this section.

(c) Exhaust emissions may not exceed a PM standard of 0.02 g/kW-hr when tested using the steady-state test procedures described in subpart F of this part for the duty cycles specified in §1039.505(b)(1). Your APUs must meet the exhaust emission standards of this section over the engine's useful life as specified in §1039.101(g). These emission standards also apply for testing with production and in-use APUs.

(d) The APU is deemed to have a valid certificate of conformity under this section if the engine manufacturer certifies the engine under 40 CFR part 1039 with a family emission limit of 0.02 g/kW-hr or less.

(e) The APU may draw power from the installed engine to regenerate a particulate filter, but you must not make any other changes to the certified engine that could reasonably be expected to increase its emissions of any pollutant.

(f) Sections 1039.115, 1039.120, 1039.125, and 1039.130 apply for APUs as written. You must exercise due diligence in ensuring that your system will not adversely affect safety or otherwise violate the prohibition of §1039.115(f).

(g) All your APUs are considered to be part of a single emission family; however, you may subdivide your APUs into multiple emission families if you show the expected emission characteristics are different during the useful life.

(h) Testing requirements apply for certification as follows:

(1) Select an emission-data APU representing a worst-case condition for PM emissions. Measure emissions from the test engine with the APU installed according to your specifications.

(2) We may require you to provide an engineering analysis showing that the performance of your emission controls will not deteriorate during the useful life with proper maintenance. If we determine that your emission controls are likely to deteriorate during the useful life, we may require you to develop and apply deterioration factors consistent with good engineering judgment.

(3) Collect emission data and round to the nearest 0.01 g/kW-hr for comparing to the standard. Calculate full-life emissions as described in §1039.240(d) if you need to apply a deterioration factor.

(4) You may ask to use emission data from a previous production period instead of doing new tests as described in §1039.235(d).

(5) Additional testing provisions apply as described in §1039.235(c), (e), and (f).

(i) Your APU certificate is valid for any engine certified under this part 1039, as long as the engine has a maximum engine power no more than 10 percent greater than the maximum engine power of the engine used for certification testing under this section.

(j) The following provisions apply for determining whether your APU complies with the requirements of this section:

(1) For purposes of certification, your emission family is considered in compliance with the emission standards of this section if all emission-data APUs representing that family have test results showing compliance with the standards.

(2) Your engine family is deemed not to comply if any emission-data APU

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representing that family for certification has test results showing a full-life emission level above the PM standard.

(k) At the time of manufacture, affix a permanent and legible label identifying each APU. This applies even if the engine manufacturer certifies a compliant engine as described in paragraph (d) of this section. The label must meet the specifications described in 40 CFR 1068.45(a). The label must—

(1) Include the heading “EMISSION CONTROL INFORMATION”.

(2) Include your full corporate name and trademark.

(3) State: “THIS APU ENGINE COMPLIES WITH 40 CFR 1039.699.”

(1) [Reserved]

(m) See §§1039.201, 1039.210, 1039.220, 1039.225, 1039.250, and 1039.255 for general requirements related to obtaining a certificate of conformity. A certificate issued under this section may apply for a production period lasting up to five years. Include the following information in your application for certification, unless we ask you to include less information:

(1) Describe the emission family’s specifications and other basic parameters of the APU’s design and emission controls. List each distinguishable configuration in the emission family. For each APU configuration, list the maximum engine power for which the APU is designed to operate.

(2) Explain how the emission control system operates. Identify the part number of each component you describe.

(3) Describe the engines you selected for testing and the reasons for selecting them.

(4) Describe the test equipment and procedures that you used. Also describe any special or alternate test procedures you used.

(5) Describe how you operated the emission-data APU before testing, including any operation to break in the APU or otherwise stabilize emission levels. Describe any scheduled maintenance you did.

(6) List the specifications of the test fuel to show that it falls within the required ranges we specify in 40 CFR part 1065.

(7) Include the maintenance and warranty instructions you will provide (see §§1039.120 and 1039.125).

(8) Describe your emission control information label.

(9) Identify the emission family’s deterioration factors and describe how you developed them, or summarize your analysis describing why you don’t expect performance of emission controls to deteriorate. Present any emission test data you used for this.

(10) State that you operated your emission-data APU as described in the application (including the test procedures, test parameters, and test fuels) to show you meet the requirements of this part.

(11) Present emission data for PM.

(12) Report all test results, including those from invalid tests, whether or not they were conducted according to the test procedures of subpart F of this part. We may ask you to send other information to confirm that your tests were valid under the requirements of this part and 40 CFR part 1065.

(13) Describe any adjustable operating parameters as described in §1039.205(s).

(14) Unconditionally certify that all the APUs in the emission family comply with the requirements of this part, other referenced parts of the CFR, and the Clean Air Act.

(15) Provide additional information if we say we need it to evaluate your application.

(16) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

(n) If a highway tractor manufacturer violates 40 CFR 1037.106(g) by installing an APU from you that is not properly certified and labeled, you are presumed to have caused the violation (see 40 CFR 1068.101(c)).

[81 FR 74138, Oct. 25, 2016]

## Subpart H—Averaging, Banking, and Trading for Certification

### § 1039.701 General provisions.

(a) You may average, bank, and trade (ABT) emission credits for purposes of certification as described in this subpart to show compliance with the standards of this part. Participation in this program is voluntary.

(b) Section 1039.740 restricts the use of emission credits to certain averaging sets.

(c) The definitions of Subpart I of this part apply to this subpart. The following definitions also apply:

(1) *Actual emission credits* means emission credits you have generated that we have verified by reviewing your final report.

(2) *Averaging set* means a set of engines in which emission credits may be exchanged only with other engines in the same averaging set.

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

(4) *Buyer* means the entity that receives emission credits as a result of a trade.

(5) *Reserved emission credits* means emission credits you have generated that we have not yet verified by reviewing your final report.

(6) *Seller* means the entity that provides emission credits during a trade.

(7) *Standard* means the emission standard that applies under subpart B of this part for engines not participating in the ABT program of this subpart.

(8) *Trade* means to exchange emission credits, either as a buyer or seller.

(d) You may not use emission credits generated under this subpart to offset any emissions that exceed an FEL or standard. This applies for all testing, including certification testing, in-use testing, selective enforcement audits, and other production-line testing. However, if emissions from an engine exceed an FEL or standard (for example, during a selective enforcement audit), you may use emission credits to recertify the engine family with a higher FEL that applies only to future production.

(e) Engine families that use emission credits for one or more pollutants may

not generate positive emission credits for another pollutant.

(f) Emission credits may be used in the model year they are generated or in future model years. Emission credits may not be used for past model years.

(g) You may increase or decrease an FEL during the model year by amending your application for certification under § 1039.225. The new FEL may apply only to engines you have not already introduced into commerce. Each engine's emission control information label must include the applicable FELs.

(h) You may use either of the following approaches to retire or forego emission credits:

(1) You may retire emission credits generated from any number of your engines. This may be considered donating emission credits to the environment. Identify any such credits in the reports described in § 1039.730. Engines must comply with the applicable FELs even if you donate or sell the corresponding emission credits under this paragraph (h). Those credits may no longer be used by anyone to demonstrate compliance with any EPA emission standards.

(2) You may certify a family using an FEL below the emission standard as described in this part and choose not to generate emission credits for that family. If you do this, you do not need to calculate emission credits for those families and you do not need to submit or keep the associated records described in this subpart for that family.

[69 FR 39213, June 29, 2004, as amended at 81 FR 74139, Oct. 25, 2016]

### § 1039.705 How do I generate and calculate emission credits?

The provisions of this section apply separately for calculating emission credits for NO<sub>x</sub>, NO<sub>x</sub> + NMHC, or PM.

(a) [Reserved]

(b) For each participating family, calculate positive or negative emission credits relative to the otherwise applicable emission standard. Calculate positive emission credits for a family that has an FEL below the standard. Calculate negative emission credits for a family that has an FEL above the standard. Sum your positive and negative credits for the model year before rounding. Round the sum of emission

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credits to the nearest kilogram (kg), using consistent units throughout the following equation:

$$\text{Emission credits (kg)} = (\text{Std} - \text{FEL}) \times (\text{Volume}) \times (\text{AvgPR}) \times (\text{UL}) \times (10^{-3})$$

Where:

Std = the emission standard, in grams per kilowatt-hour, that applies under subpart B of this part for engines not participating in the ABT program of this subpart (the “otherwise applicable standard”).

FEL = the family emission limit for the engine family, in grams per kilowatt-hour.

Volume = the number of engines eligible to participate in the averaging, banking, and trading program within the given engine family during the model year, as described in paragraph (c) of this section.

AvgPR = the average value of maximum engine power values for the engine configurations within an engine family, calculated on a sales-weighted basis, in kilowatts.

UL = the useful life for the given engine family, in hours.

(c) As described in §1039.730, compliance with the requirements of this subpart is determined at the end of the model year based on actual U.S.-directed production volumes. Do not include any of the following engines to calculate emission credits:

(1) Engines with a permanent exemption under subpart G of this part or under 40 CFR part 1068.

(2) Exported engines.

(3) Engines not subject to the requirements of this part, such as those excluded under §1039.5.

(4) Engines in families that include only stationary engines, except for engines in families certified to standards that are identical to standards applicable under this part 1039 to nonroad engines of the same type for the same model year.

(5) Any other engines, where we indicate elsewhere in this part 1039 that they are not to be included in the calculations of this subpart.

[69 FR 39213, June 29, 2004, as amended at 71 FR 39185, July 11, 2006; 72 FR 53133, Sept. 18, 2007; 75 FR 22992, Apr. 30, 2010; 81 FR 74139, Oct. 25, 2016]

### § 1039.710 How do I average emission credits?

(a) Averaging is the exchange of emission credits among your engine families. You may average emission credits only within the same averaging set.

(b) You may certify one or more engine families to an FEL above the applicable standard, subject to the FEL caps and other provisions in subpart B of this part, if you show in your application for certification that your projected balance of all emission-credit transactions in that model year is greater than or equal to zero.

(c) If you certify an engine family to an FEL that exceeds the otherwise applicable standard, you must obtain enough emission credits to offset the engine family's deficit by the due date for the final report required in §1039.730. The emission credits used to address the deficit may come from your other engine families that generate emission credits in the same model year, from emission credits you have banked from previous model years, or from emission credits generated in the same or previous model years that you obtained through trading.

[69 FR 39213, June 29, 2004, as amended at 81 FR 74140, Oct. 25, 2016]

### § 1039.715 How do I bank emission credits?

(a) Banking is the retention of emission credits by the manufacturer generating the emission credits for use in future model years for averaging or trading.

(b) You may designate any emission credits you plan to bank in the reports you submit under §1039.730 as reserved credits. During the model year and before the due date for the final report, you may designate your reserved emission credits for averaging or trading.

(c) Reserved credits become actual emission credits when you submit your final report. However, we may revoke these emission credits if we are unable to verify them after reviewing your reports or auditing your records.

[75 FR 22992, Apr. 30, 2010]

**§ 1039.720 How do I trade emission credits?**

(a) Trading is the exchange of emission credits between manufacturers. You may use traded emission credits for averaging, banking, or further trading transactions. Traded emission credits may be used only within the averaging set in which they were generated.

(b) You may trade actual emission credits as described in this subpart. You may also trade reserved emission credits, but we may revoke these emission credits based on our review of your records or reports or those of the company with which you traded emission credits. You may trade banked credits within an averaging set to any certifying manufacturer.

(c) If a negative emission credit balance results from a transaction, both the buyer and seller are liable, except in cases we deem to involve fraud. See § 1039.255(e) for cases involving fraud. We may void the certificates of all engine families participating in a trade that results in a manufacturer having a negative balance of emission credits. See § 1039.745.

[69 FR 39213, June 29, 2004, as amended at 75 FR 22992, Apr. 30, 2010]

**§ 1039.725 What must I include in my application for certification?**

(a) You must declare in your application for certification your intent to use the provisions of this subpart for each engine family that will be certified using the ABT program. You must also declare the FELs you select for the engine family for each pollutant for which you are using the ABT program. Your FELs must comply with the specifications of subpart B of this part, including the FEL caps. FELs must be expressed to the same number of decimal places as the applicable standards.

(b) Include the following in your application for certification:

(1) A statement that, to the best of your belief, you will not have a negative balance of emission credits for any averaging set when all emission credits are calculated at the end of the year.

(2) Detailed calculations of projected emission credits (positive or negative) based on projected production volumes.

We may require you to include similar calculations from your other engine families to demonstrate that you will be able to avoid negative credit balances for the model year. If you project negative emission credits for a family, state the source of positive emission credits you expect to use to offset the negative emission credits.

[69 FR 39213, June 29, 2004, as amended at 75 FR 22992, Apr. 30, 2010; 81 FR 74140, Oct. 25, 2016]

**§ 1039.730 What ABT reports must I send to EPA?**

(a) If any of your engine families are certified using the ABT provisions of this subpart, you must send an end-of-year report within 90 days after the end of the model year and a final report within 270 days after the end of the model year. We may waive the requirement to send the end-of-year report, as long as you send the final report on time.

(b) Your end-of-year and final reports must include the following information for each engine family participating in the ABT program:

(1) Engine-family designation and averaging set.

(2) The emission standards that would otherwise apply to the engine family.

(3) The FEL for each pollutant. If you change the FEL after the start of production, identify the date that you started using the new FEL and/or give the engine identification number for the first engine covered by the new FEL. In this case, identify each applicable FEL and calculate the positive or negative emission credits as specified in § 1039.225.

(4) The projected and actual U.S.-directed production volumes for the model year. If you changed an FEL during the model year, identify the actual U.S.-directed production volume associated with each FEL.

(5) Maximum engine power for each engine configuration, and the average engine power weighted by U.S.-directed production volumes for the engine family.

(6) Useful life.

(7) Calculated positive or negative emission credits for the whole engine family. Identify any emission credits

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that you traded, as described in paragraph (d)(1) of this section.

(c) Your end-of-year and final reports must include the following additional information:

(1) Show that your net balance of emission credits from all your participating engine families in each averaging set in the applicable model year is not negative.

(2) State whether you will retain any emission credits for banking. If you choose to retire emission credits that would otherwise be eligible for banking, identify the engine families that generated the emission credits, including the number of emission credits from each family.

(3) State that the report's contents are accurate.

(d) If you trade emission credits, you must send us a report within 90 days after the transaction, as follows:

(1) As the seller, you must include the following information in your report:

(i) The corporate names of the buyer and any brokers.

(ii) A copy of any contracts related to the trade.

(iii) The averaging set corresponding to the engine families that generated emission credits for the trade, including the number of emission credits from each averaging set.

(2) As the buyer, you must include the following information in your report:

(i) The corporate names of the seller and any brokers.

(ii) A copy of any contracts related to the trade.

(iii) How you intend to use the emission credits, including the number of emission credits you intend to apply for each averaging set.

(e) Send your reports electronically to the Designated Compliance Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.

(f) Correct errors in your end-of-year report or final report as follows:

(1) You may correct any errors in your end-of-year report when you prepare the final report, as long as you send us the final report by the time it is due.

(2) If you or we determine within 270 days after the end of the model year that errors mistakenly decreased your balance of emission credits, you may correct the errors and recalculate the balance of emission credits. You may not make these corrections for errors that are determined more than 270 days after the end of the model year. If you report a negative balance of emission credits, we may disallow corrections under this paragraph (f)(2).

(3) If you or we determine anytime that errors mistakenly increased your balance of emission credits, you must correct the errors and recalculate the balance of emission credits.

[69 FR 39213, June 29, 2004, as amended at 72 FR 53133, Sept. 18, 2007; 75 FR 22992, Apr. 30, 2010; 81 FR 74140, Oct. 25, 2016]

### § 1039.735 What records must I keep?

(a) You must organize and maintain your records as described in this section.

(b) Keep the records required by this section for at least eight years after the due date for the end-of-year report. You may not use emission credits for any engines if you do not keep all the records required under this section. You must therefore keep these records to continue to bank valid credits.

(c) Keep a copy of the reports we require in § 1039.725 and § 1039.730.

(d) Keep records of the engine identification number for each engine you produce that generates or uses emission credits under the ABT program. You may identify these numbers as a range. If you change the FEL after the start of production, identify the date you started using each FEL and the range of engine identification numbers associated with each FEL. You must also identify the purchaser and destination for each engine you produce to the extent this information is available.

(e) We may require you to keep additional records or to send us relevant information not required by this section in accordance with the Clean Air Act.

[69 FR 39213, June 29, 2004, as amended at 72 FR 53133, Sept. 18, 2007; 75 FR 22993, Apr. 30, 2010; 81 FR 74140, Oct. 25, 2016]



§ 1039.740

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§ 1039.740 What restrictions apply for using emission credits?

The following restrictions apply for using emission credits:

(a) *Averaging sets.* Emission credits may be exchanged only within an averaging set. For emission credits generated by Tier 4 engines, there are two averaging sets—one for engines at or

below 560 kW and another for engines above 560 kW.

(b) *Emission credits from earlier tiers of standards.* (1) For purposes of ABT under this subpart, you may not use emission credits generated from engines subject to emission standards identified in appendix I of this part, except as specified in § 1039.102(d)(1) or as follows:

If the maximum power of the credit-generating engine is * * *	And it was certified to the following standards identified in appendix I of this part * * *	Then you may use those banked credits for the following Tier 4 engines * * *
(i) kW < 19 .....	Tier 2 .....	kW < 19.
(ii) 19 ≤ kW < 37 .....	Tier 2 .....	kW ≥ 19.
(iii) 37 ≤ kW ≤ 560 .....	Tier 3 .....	kW ≥ 19.
(iv) kW > 560 .....	Tier 2 .....	kW ≥ 19.

(2) Emission credits generated from marine engines certified to the standards identified in appendix I of this part for land-based engines may not be used under this part.

(c) *NO<sub>x</sub> and NO<sub>x</sub> + NMHC emission credits.* You may use NO<sub>x</sub> emission credits without adjustment to show compliance with NO<sub>x</sub> + NMHC standards. You may use NO<sub>x</sub> + NMHC emission credits to show compliance with NO<sub>x</sub> standards, but you must adjust the NO<sub>x</sub> + NMHC emission credits downward by twenty percent when you use them, as shown in the following equation:

$$\text{NO}_x \text{ emission credits} = (0.8) \times (\text{NO}_x + \text{NMHC emission credits}).$$

(d) *Other restrictions.* Other sections of this part specify additional restrictions for using emission credits under certain special provisions.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40464, July 13, 2005; 81 FR 74140, Oct. 25, 2016; 86 FR 34506, June 29, 2021]

§ 1039.745 What can happen if I do not comply with the provisions of this subpart?

(a) For each engine family participating in the ABT program, the certificate of conformity is conditional upon full compliance with the provisions of this subpart during and after the model year. You are responsible to establish to our satisfaction that you fully comply with applicable requirements. We may void the certificate of conformity

for an engine family if you fail to comply with any provisions of this subpart.

(b) You may certify your engine family to an FEL above an applicable standard based on a projection that you will have enough emission credits to offset the deficit for the engine family. However, we may void the certificate of conformity if you cannot show in your final report that you have enough actual emission credits to offset a deficit for any pollutant in an engine family.

(c) We may void the certificate of conformity for an engine family if you fail to keep records, send reports, or give us information we request.

(d) You may ask for a hearing if we void your certificate under this section (see § 1039.820).

Subpart I—Definitions and Other Reference Information

§ 1039.801 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. 7401–7671q.

*Adjustable parameter* has the meaning given in 40 CFR 1068.50.

*Aftertreatment* means relating to a catalytic converter, particulate filter, or any other system, component, or technology mounted downstream of the

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exhaust valve (or exhaust port) whose design function is to decrease emissions in the engine exhaust before it is exhausted to the environment. Exhaust-gas recirculation (EGR) and turbochargers are not aftertreatment.

*Aircraft* means any vehicle capable of sustained air travel more than 100 feet above the ground.

*Alcohol-fueled engine* means an engine that is designed to run using an alcohol fuel. For purposes of this definition, alcohol fuels do not include fuels with a nominal alcohol content below 25 percent by volume.

*Amphibious vehicle* means a vehicle with wheels or tracks that is designed primarily for operation on land and secondarily for operation in water.

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

*Brake power* means the usable power output of the engine, not including power required to fuel, lubricate, or heat the engine, circulate coolant to the engine, or to operate aftertreatment devices.

*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.

*Carryover* means relating to certification based on emission data generated from an earlier model year as described in § 1039.235(d).

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

*Certified emission level* means the highest deteriorated emission level in an engine family for a given pollutant from either transient or steady-state testing.

*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 whose certification is limited to

constant-speed operation. Engines whose constant-speed governor function is removed or disabled are no longer constant-speed engines.

*Constant-speed operation* has the meaning given in 40 CFR 1065.1001.

*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.

*Critical emission-related component* has the meaning given in 40 CFR 1068.30.

*Date of manufacture* has the meaning given in 40 CFR 1068.30.

*Designated Compliance Officer* means the Director, Diesel Engine Compliance Center, U.S. Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor, MI 48105; [complianceinfo@epa.gov](mailto:complianceinfo@epa.gov); [www.epa.gov/ve-certification](http://www.epa.gov/ve-certification)

*Deteriorated emission level* means the emission level that results from applying the appropriate deterioration factor to the official emission result of the emission-data engine.

*Deterioration factor* means the relationship between emissions at the end of useful life and emissions at the low-hour test point, expressed in one of the following ways:

(1) For multiplicative deterioration factors, the ratio of emissions at the end of useful life to emissions at the low-hour test point.

(2) For additive deterioration factors, the difference between emissions at the end of useful life and emissions at the low-hour test point.

*Diesel exhaust fluid (DEF)* means a liquid reducing agent (other than the engine fuel) used in conjunction with selective catalytic reduction to reduce NO<sub>x</sub> emissions. *Diesel exhaust fluid* is generally understood to be an aqueous solution of urea conforming to the specifications of ISO 22241.

*Discrete-mode* means relating to the discrete-mode type of steady-state test described in § 1039.505.

*Dual-fuel* means relating to an engine designed for operation on two different fuels but not on a continuous mixture of those fuels (see § 1039.601(b)). For purposes of this part, such an engine remains a dual-fuel engine even if it is

designed for operation on three or more different fuels.

*Emergency equipment* means any of the following types of equipment that is not a motor vehicle:

(1) Specialized vehicles used to perform aircraft rescue and/or fire-fighting functions at airports, with particular emphasis on saving lives and reducing injuries coincident with aircraft fires following impact, or aircraft ground fires.

(2) Wildland firefighting equipment designed primarily to support wildland fire suppression operations. For example, a bulldozer designed with special features for fighting wildfires would be a piece of emergency equipment.

(3) Any other equipment that we have determined will likely be used in emergency situations where emission control function or malfunction may cause a significant risk to human life. For example, we would consider nonroad equipment that is certain to be retrofitted with a slip-on fire-fighting module to be emergency equipment, irrespective of the equipment manufacturer's original design. In making this determination, we may consider any factor that has an effect on the totality of the actual risk to human life. For example, we may consider how frequently the equipment will be used in emergency situations or how likely it is that the emission controls will cause a significant risk to human life when the equipment is used in emergency situations. We will consider to what extent the flexibility provisions of §1039.665 already address the risk. In the example above, we would not consider equipment to be emergency equipment if there is merely a possibility (rather than a certainty) that the equipment will be retrofitted with a slip-on firefighting module.

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

*Emission-data engine* means an engine that is tested for certification. This includes engines tested to establish deterioration factors.

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

*Engine configuration* means a unique combination of engine hardware and calibration within an engine family. Engines within a single engine configuration differ only with respect to normal production variability or factors unrelated to emissions.

*Engine family* has the meaning given in §1039.230.

*Engine manufacturer* means the manufacturer of the engine. See the definition of “manufacturer” in this section.

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

*Equipment manufacturer* means a manufacturer of nonroad equipment. All nonroad equipment manufacturing entities under the control of the same person are considered to be a single nonroad equipment manufacturer. (Note: In §1039.626, the term “equipment manufacturer” has a narrower meaning, which applies only to that section.)

*Excluded* means relating to an engine that either:

(1) Has been determined not to be a nonroad engine, as specified in 40 CFR 1068.30; or

(2) Is a nonroad engine that, according to §1039.5, is not subject to this part 1039.

*Exempted* has the meaning we give in 40 CFR 1068.30.

*Exhaust-gas recirculation* means a technology that reduces emissions by routing exhaust gases that had been exhausted from the combustion chamber(s) back into the engine to be mixed with incoming air before or during combustion. The use of valve timing to increase the amount of residual exhaust gas in the combustion chamber(s) that is mixed with incoming air before or during combustion is not considered exhaust-gas recirculation for the purposes of this part.

*Family emission limit (FEL)* means an emission level declared by the manufacturer to serve in place of an otherwise applicable emission standard under the ABT program in subpart H of this part. The family emission limit must be expressed to the same number of decimal places as the emission

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standard it replaces. The family emission limit serves as the emission standard for the engine family with respect to all required testing.

*Flexible-fuel* means relating to an engine designed for operation on any mixture of two or more different fuels (see § 1039.601(b)).

*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 diesel fuel or natural gas. There can be multiple grades within a single fuel type, such as high-sulfur or low-sulfur diesel fuel.

*Generator-set engine* means an engine used primarily to operate an electrical generator or alternator to produce electric power for other applications.

*Good engineering judgment* has the meaning we give in 40 CFR 1068.30. See 40 CFR 1068.5 for the administrative process we use to evaluate good engineering judgment.

*High-sulfur diesel fuel* means one of the following:

(1) For in-use fuels, *high-sulfur diesel fuel* means a diesel fuel with a maximum sulfur concentration greater than 500 parts per million.

(2) For testing, *high-sulfur diesel fuel* has the meaning we give in 40 CFR part 1065.

*Hydrocarbon (HC)* means the hydrocarbon group on which the emission standards are based for each fuel type. For alcohol-fueled engines, HC means total hydrocarbon equivalent (THCE). For all other engines, HC means non-methane hydrocarbon (NMHC).

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

*Intermediate test speed* has the meaning given in 40 CFR 1065.1001.

*Low-hour* means relating to an engine with stabilized emissions and represents the undeteriorated emission level. This would generally involve less than 300 hours of operation for engines

with NO<sub>x</sub> aftertreatment and 125 hours of operation for other engines.

*Low-sulfur diesel fuel* means one of the following:

(1) For in-use fuels, *low-sulfur diesel fuel* means a diesel fuel with a maximum sulfur concentration of 500 parts per million.

(2) For testing, *low-sulfur diesel fuel* has the meaning we give in 40 CFR part 1065.

*Manufacture* means the physical and engineering process of designing, constructing, and assembling a nonroad engine or a piece of nonroad equipment.

*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. (Note: In § 1039.626, the term “equipment manufacturer” has a narrower meaning, which applies only to that section.)

*Marine engine* means a nonroad engine that is installed or intended to be installed on a marine vessel. This includes a portable auxiliary marine engine only if its fueling, cooling, or exhaust system is an integral part of the 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* has the meaning given in 1 U.S.C. 3, except that it does not include amphibious vehicles. The definition in 1 U.S.C. 3 very broadly includes every craft capable of being used as a means of transportation on water.

*Maximum engine power* has the meaning given in § 1039.140. Note that § 1039.230 generally disallows grouping engines from different power categories in the same engine family.

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

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

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*Model year* means one of the following things:

(1) For freshly manufactured equipment and engines (*see* definition of “new nonroad engine,” paragraph (1)), model year means one of the following:

(i) Calendar year of production.

(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 as a stationary engine, or being certified and placed into service as a motor vehicle engine, model year means the calendar year in which the engine was originally produced. For a motor vehicle engine that is converted to be a nonroad engine without having been certified, model year means the calendar year in which the engine becomes a new nonroad engine. (*See* definition of “new nonroad engine,” paragraph (2).)

(3) For a nonroad engine excluded under §1039.5 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 (*see* definition of “new nonroad engine,” paragraph (4)).

(5) For imported engines:

(i) For imported engines described in paragraph (5)(i) of the definition of “new nonroad engine,” *model year* has the meaning given in paragraphs (1) through (4) of this definition.

(ii) For imported engines described in paragraph (5)(ii) of the definition of “new nonroad engine” in this section, model year means the calendar year in which the engine is modified.

(iii) For imported engines described in paragraph (5)(iii) of the definition of “new nonroad engine,” *model year* means the calendar year in which the engine is first assembled in its im-

ported configuration, unless specified otherwise in this part or in 40 CFR part 1068.

*Motor vehicle* has the meaning we give in 40 CFR 85.1703(a).

*New nonroad engine* means any of the following things:

(1) A freshly manufactured nonroad engine for which the ultimate purchaser has never received the equitable or legal title. This kind of engine might commonly be thought of as “brand new.” In the case of this paragraph (1), the engine is new from the time it is produced until the ultimate purchaser receives the title or the product is placed into service, whichever comes first.

(2) An engine originally manufactured as a motor vehicle engine or a stationary engine that is later used or intended to be used in a piece of nonroad equipment. In this case, the engine is no longer a motor vehicle or stationary engine and becomes a “new nonroad engine.” The engine is no longer new when it is placed into nonroad service. This paragraph (2) applies if a motor vehicle engine or a stationary engine is installed in nonroad equipment, or if a motor vehicle or a piece of stationary equipment is modified (or moved) to become nonroad equipment.

(3) A nonroad engine that has been previously placed into service in an application we exclude under §1039.5, when that engine is installed in a piece of equipment that is covered by this part 1039. The engine is no longer new when it is placed into nonroad service covered by this part 1039. For example, this would apply to marine diesel engine that is no longer used in a marine vessel but is instead installed in a piece of nonroad equipment subject to the provisions of this part.

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

(5) An imported nonroad engine, subject to the following provisions:

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(i) An imported nonroad engine covered by a certificate of conformity issued under this part that meets the criteria of one or more of paragraphs (1) through (4) of this definition, where the original engine manufacturer holds the certificate, is new as defined by those applicable paragraphs.

(ii) An imported engine covered by a certificate of conformity issued under this part, where someone other than the original engine manufacturer holds the certificate (such as when the engine is modified after its initial assembly), is a new nonroad engine when it is imported. It is no longer new when the ultimate purchaser receives a title for the engine or it is placed into service, whichever comes first.

(iii) An imported nonroad engine that is not covered by a certificate of conformity issued under this part at the time of importation is new, but only if it was produced on or after the dates shown in the following table. This addresses uncertified engines and equipment initially placed into service that someone seeks to import into the United States. Importation of this kind of engine (or equipment containing such an engine) is generally prohibited by 40 CFR part 1068. However, the importation of such an engine is not prohibited if the engine has an earlier model year than that identified in the following table:

APPLICABILITY OF EMISSION STANDARDS FOR  
NONROAD DIESEL ENGINES

Maximum engine power	Initial date of emission standards
kW <19 .....	January 1, 2000.
19 ≤kW <37 .....	January 1, 1999.
37 ≤kW <75 .....	January 1, 1998.
75 ≤kW <130 .....	January 1, 1997.
130 ≤kW ≤560 .....	January 1, 1996.
kW >560 .....	January 1, 2000.

*New nonroad equipment* means either of the following things:

(1) A nonroad piece of equipment for which the ultimate purchaser has never received the equitable or legal title. The product is no longer new when the ultimate purchaser 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 requirements of this part start to apply (see § 1039.1).

*Noncommercial fuel* means a combustible product that is not marketed as a commercial fuel, but is used as a fuel for nonroad engines. For example, this includes methane that is produced and released from landfills or oil wells, or similar unprocessed fuels that are not intended to meet any otherwise applicable fuel specifications. See § 1039.615 for provisions related to engines designed to burn noncommercial fuels.

*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 hydrocarbons (NMHC)* means the sum of all hydrocarbon species except methane. Refer to 40 CFR 1065.660 for NMHC determination.

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

*Nonroad engine* has the meaning we give in 40 CFR 1068.30. In general this means all internal-combustion engines except motor vehicle engines, stationary engines, engines used solely for competition, or engines used in aircraft. This part does not apply to all nonroad engines (see § 1039.5).

*Nonroad equipment* means a piece of equipment that is powered by one or more nonroad engines.

*Official emission result* means the measured emission rate for an emission-data engine on a given duty cycle before the application of any deterioration factor, but after the applicability of regeneration adjustment factors.

*Opacity* means the fraction of a beam of light, expressed in percent, which fails to penetrate a plume of smoke, as measured by the procedure specified in § 1039.501.

*Owners manual* means a document or collection of documents prepared by the engine manufacturer for the owner

or operator to describe appropriate engine maintenance, applicable warranties, and any other information related to operating or keeping the engine. The owners manual is typically provided to the ultimate purchaser at the time of sale. The owners manual may be in paper or electronic format.

*Oxides of nitrogen* has the meaning given in 40 CFR 1065.1001.

*Particulate trap* means a filtering device that is designed to physically trap all particulate matter above a certain size.

*Piece of equipment* means any vehicle, vessel, or other type of equipment using engines to which this part applies.

*Placed into service* means put into initial use for its intended purpose. Engines and equipment do not qualify as being “placed into service” based on incidental use by a manufacturer or dealer.

*Power category* means a specific range of maximum engine power that defines the applicability of standards. For example, references to the 56–130 kW power category and  $56 \leq \text{kW} < 130$  include all engines with maximum engine power at or above 56 kW but below 130 kW. Also references to 56–560 kW power categories or  $56 \leq \text{kW} \leq 560$  include all engines with maximum engine power at or above 56 kW but at or below 560 kW, even though these engines span multiple power categories. Note that in some cases, FEL caps are based on a subset of a power category. The power categories are defined as follows:

- (1) Engines with maximum power below 19 kW.
- (2) Engines with maximum power at or above 19 kW but below 56 kW.
- (3) Engines with maximum power at or above 56 kW but below 130 kW.
- (4) Engines with maximum power at or above 130 kW but at or below 560 kW.
- (5) Engines with maximum power above 560 kW.

*Ramped-modal* means relating to the ramped-modal type of steady-state test described in § 1039.505.

*Rated speed* means the maximum full-load governed speed for governed engines and the speed of maximum power for ungoverned engines.

*Revoke* has the meaning we give in 40 CFR 1068.30.

*Round* has the meaning given in 40 CFR 1065.1001.

*Scheduled maintenance* means adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems periodically to keep a part or system from failing, malfunctioning, or wearing prematurely. 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 engine manufacturer* means an engine manufacturer with 1,000 or fewer employees that has had annual U.S.-directed production volume of no more than 2,500 units. For manufacturers owned by a parent company, these limits apply to the total number of employees and production volume from the parent company and all its subsidiaries.

*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.

*Steady-state* has the meaning given in 40 CFR 1065.1001.

*Sulfur-sensitive technology* means an emission control technology that experiences a significant drop in emission control performance or emission-system durability when an engine is operated on low-sulfur diesel fuel (*i.e.*, fuel with a sulfur concentration of 300 to 500 ppm) as compared to when it is operated on ultra-low sulfur diesel fuel (*i.e.*, fuel with a sulfur concentration less than 15 ppm). Exhaust gas recirculation is not a sulfur-sensitive technology.

*Suspend* has the meaning we give in 40 CFR 1068.30.

*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. This may include testing for certification, production-line testing, or in-use testing.

*Tier 1* means relating to the Tier 1 emission standards identified in appendix I of this part.

*Tier 2* means relating to the Tier 2 emission standards identified in appendix I of this part.

*Tier 3* means relating to the Tier 3 emission standards identified in appendix I of this part.

*Tier 4* means relating to the Tier 4 emission standards, as shown in §1039.101 and §1039.102. This includes the emission standards that are shown in §1039.101 and §1039.102 that are unchanged from Tier 2 or Tier 3 emission standards.

*Total hydrocarbon* has the meaning given in 40 CFR 1065.1001. This generally means the combined mass of organic compounds measured by the specified procedure for measuring total hydrocarbon, expressed as a hydrocarbon with an atomic hydrogen-to-carbon ratio of 1.85:1.

*Total hydrocarbon equivalent* has the meaning given in 40 CFR 1065.1001. This generally 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 exhaust hydrocarbon from petroleum-fueled engines. The atomic hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

*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.

*Ultra low-sulfur diesel fuel* means one of the following:

(1) For in-use fuels, *ultra low-sulfur diesel fuel* means a diesel fuel with a maximum sulfur concentration of 15 parts per million.

(2) For testing, *ultra low-sulfur diesel fuel* has the meaning we give in 40 CFR part 1065.

*United States* has the meaning we give in 40 CFR 1068.30.

*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 purchasers 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, whichever comes first. It is the period during which a nonroad engine is required to comply with all applicable emission standards. See §1039.101(g).

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

*Void* has the meaning we give in 40 CFR 1068.30.

*Volatile liquid fuel* means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch.

*We (us, our)* means the Administrator of the Environmental Protection Agency and any authorized representatives.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40464, July 13, 2005; 72 FR 53133, Sept. 18, 2007; 73 FR 59192, Oct. 8, 2008; 75 FR 22993, Apr. 30, 2010; 77 FR 34147, June 8, 2012; 79 FR 46375, Aug. 8, 2014; 81 FR 74140, Oct. 25, 2016; 86 FR 34506, June 29, 2021; 88 FR 4660, Jan. 24, 2023]

#### § 1039.805 What symbols, acronyms, and abbreviations does this part use?

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

CFR Code of Federal Regulations.  
 CH<sub>4</sub> methane.  
 CO carbon monoxide.  
 CO<sub>2</sub> carbon dioxide.  
 DEF Diesel exhaust fluid.  
 EEFM Emergency equipment field modification.  
 EPA Environmental Protection Agency.  
 FEL Family Emission Limit.  
 g/kW-hr grams per kilowatt-hour.  
 HC hydrocarbon.  
 ISO International Organization for Standardization (see [www.iso.org](http://www.iso.org)).  
 kW kilowatts.  
 N<sub>2</sub>O nitrous oxide.  
 NIST National Institute of Standards and Technology.  
 NMHC nonmethane hydrocarbons.  
 NO<sub>x</sub> oxides of nitrogen (NO and NO<sub>2</sub>).  
 NTE not-to-exceed  
 PM particulate matter.  
 rpm revolutions per minute.  
 SAE Society of Automotive Engineers.



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SCR Selective catalytic reduction.  
SEA Selective enforcement audit.  
THC total hydrocarbon.  
THCE total hydrocarbon equivalent.  
TRU transportation refrigeration unit.  
U.S.C. United States Code.

[69 FR 39213, June 29, 2004, as amended at 74 FR 56509, Oct. 30, 2009; 77 FR 34148, June 8, 2012]

### § 1039.815 What provisions apply to confidential information?

The provisions of 40 CFR 1068.10 apply for information you consider confidential.

[81 FR 74141, Oct. 25, 2016]

### § 1039.820 How do I request a hearing?

(a) You may request a hearing under certain circumstances, as described elsewhere in this part. To do this, you must file a written request, including a description of your objection and any supporting data, within 30 days after we make a decision.

(b) For a hearing you request under the provisions of this part, we will approve your request if we find that your request raises a substantial factual issue.

(c) If we agree to hold a hearing, we will use the procedures specified in 40 CFR part 1068, subpart G.

### § 1039.825 What reporting and record-keeping requirements apply under this part?

(a) This part includes various requirements to submit and record data or other information. Unless we specify otherwise, store required records in any format and on any media and keep them readily available for eight years after you send an associated application for certification, or eight years after you generate the data if they do not support an application for certification. You are expected to keep your own copy of required records rather than relying on someone else to keep records on your behalf. We may review these records at any time. You must promptly send us organized, written records in English if we ask for them. We may require you to submit written records in an electronic format.

(b) The regulations in § 1039.255, 40 CFR 1068.25, and 40 CFR 1068.101 describe your obligation to report truth-

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ful and complete information. This includes information not related to certification. Failing to properly report information and keep the records we specify violates 40 CFR 1068.101(a)(2), which may involve civil or criminal penalties.

(c) Send all reports and requests for approval to the Designated Compliance Officer (see § 1039.801).

(d) Any written information we require you to send to or receive from another company is deemed to be a required record under this section. Such records are also deemed to be submissions to EPA. We may require you to send us these records whether or not you are a certificate holder.

(e) Under the Paperwork Reduction Act (44 U.S.C. 3501 et seq), the Office of Management and Budget approves the reporting and recordkeeping specified in the applicable regulations. The following items illustrate the kind of reporting and recordkeeping we require for engines and equipment regulated under this part:

(1) We specify the following requirements related to engine certification in this part 1039:

(i) In § 1039.20 we require engine manufacturers to label stationary engines that do not meet the standards in this part.

(ii) In § 1039.135 we require engine manufacturers to keep certain records related to duplicate labels sent to equipment manufacturers.

(iii) [Reserved]

(iv) In subpart C of this part we identify a wide range of information required to certify engines.

(v) [Reserved]

(vi) In subpart G of this part we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various special compliance provisions. For example, equipment manufacturers must submit reports and keep records related to the flexibility provisions in § 1039.625.

(vii) In § 1039.725, 1039.730, and 1039.735 we specify certain records related to averaging, banking, and trading.

(2) We specify the following requirements related to testing in 40 CFR part 1065:

(i) In 40 CFR 1065.2 we give an overview of principles for reporting information.

(ii) In 40 CFR 1065.10 and 1065.12 we specify information needs for establishing various changes to published test procedures.

(iii) In 40 CFR 1065.25 we establish basic guidelines for storing test information.

(iv) In 40 CFR 1065.695 we identify the specific information and data items to record when measuring emissions.

(3) We specify the following requirements related to the general compliance provisions in 40 CFR part 1068:

(i) In 40 CFR 1068.5 we establish a process for evaluating good engineering judgment related to testing and certification.

(ii) In 40 CFR 1068.25 we describe general provisions related to sending and keeping information.

(iii) In 40 CFR 1068.27 we require manufacturers to make engines available for our testing or inspection if we make such a request.

(iv) In 40 CFR 1068.105 we require equipment manufacturers to keep certain records related to duplicate labels from engine manufacturers.

(v) In 40 CFR 1068.120 we specify recordkeeping related to rebuilding engines.

(vi) In 40 CFR part 1068, subpart C, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various exemptions.

(vii) In 40 CFR part 1068, subpart D, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to importing engines.

(viii) In 40 CFR 1068.450 and 1068.455 we specify certain records related to testing production-line engines in a selective enforcement audit.

(ix) In 40 CFR 1068.501 we specify certain records related to investigating and reporting emission-related defects.

(x) In 40 CFR 1068.525 and 1068.530 we specify certain records related to recalling nonconforming engines.

(xi) In 40 CFR part 1068, subpart G, we specify certain records for requesting a hearing.

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#### APPENDIX I TO PART 1039—SUMMARY OF PREVIOUS EMISSION STANDARDS

The following standards, which EPA originally adopted under 40 CFR part 89, apply to nonroad compression-ignition engines produced before the model years specified in §1039.1:

(a) Tier 1 standards apply as summarized in the following table:

TABLE 1 TO APPENDIX I—TIER 1 EMISSION STANDARDS  
[g/kW-hr]

Rated power (kW)	Starting model year	NO <sub>x</sub>	HC	NO <sub>x</sub> + NMHC	CO	PM
kW < 8 .....	2000	.....	.....	10.5	8.0	1.0
8 ≤ kW < 19 .....	2000	.....	.....	9.5	6.6	0.80
19 ≤ kW < 37 .....	1999	.....	.....	9.5	5.5	0.80
37 ≤ kW < 75 .....	1998	9.2	.....	.....	.....	.....
75 ≤ kW < 130 .....	1997	9.2	.....	.....	.....	.....
130 ≤ kW ≤ 560 .....	1996	9.2	1.3	.....	11.4	0.54
kW > 560 .....	2000	9.2	1.3	.....	11.4	0.54

(b) Tier 2 standards apply as summarized in the following table:

TABLE 2 TO APPENDIX I—TIER 2 EMISSION STANDARDS  
[g/kW-hr]

Rated power (kW)	Starting model year	NO <sub>x</sub> + NMHC	CO	PM
kW < 8 .....	2005	7.5	8.0	0.80
8 ≤ kW < 19 .....	2005	7.5	6.6	0.80
19 ≤ kW < 37 .....	2004	7.5	5.5	0.60
37 ≤ kW < 75 .....	2004	7.5	5.0	0.40
75 ≤ kW < 130 .....	2003	6.6	5.0	0.30

TABLE 2 TO APPENDIX I—TIER 2 EMISSION STANDARDS—Continued  
[g/kW-hr]

Rated power (kW)	Starting model year	NO <sub>x</sub> + NMHC	CO	PM
130 ≤ kW < 225 .....	2003	6.6	3.5	0.20
225 ≤ kW < 450 .....	2001	6.4	3.5	0.20
450 ≤ kW ≤ 560 .....	2002	6.4	3.5	0.20
kW > 560 .....	2006	6.4	3.5	0.20

(c) Tier 3 standards apply as summarized in the following table:

TABLE 3 TO APPENDIX I—TIER 3 EMISSION STANDARDS  
[g/kW-hr]

Rated power (kW)	Starting model year	NO <sub>x</sub> +NMHC	CO	PM
37 ≤ kW < 75 .....	2008	4.7	5.0	0.40
75 ≤ kW < 130 .....	2007	4.0	5.0	0.30
130 ≤ kW ≤ 560 .....	2006	4.0	3.5	0.20

(d) Tier 1 through Tier 3 standards applied for discrete-mode steady-state testing. There were no not-to-exceed standards or transient testing.

[86 FR 34507, June 29, 2021, as amended at 88 FR 4660, Jan. 24, 2023]

## APPENDIX II TO PART 1039—STEADY-STATE DUTY CYCLES

(a) The following duty cycles apply for constant-speed engines:

(1) The following duty cycle applies for discrete-mode testing:

D2 mode number	Engine speed	Torque (percent) <sup>1</sup>	Weighting factors
1 .....	Engine governed .....	100	0.05
2 .....	Engine governed .....	75	0.25
3 .....	Engine governed .....	50	0.30
4 .....	Engine governed .....	25	0.30
5 .....	Engine governed .....	10	0.10

<sup>1</sup> The percent torque is relative to maximum test torque.

(2) The following duty cycle applies for ramped-modal testing:

RMC mode	Time in mode (seconds)	Engine speed	Torque (percent) <sup>1 2</sup>
1a Steady-state .....	53	Engine governed .....	100.
1b Transition .....	20	Engine governed .....	Linear transition.
2a Steady-state .....	101	Engine governed .....	10.
2b Transition .....	20	Engine governed .....	Linear transition.
3a Steady-state .....	277	Engine governed .....	75.
3b Transition .....	20	Engine governed .....	Linear transition.
4a Steady-state .....	339	Engine governed .....	25.
4b Transition .....	20	Engine governed .....	Linear transition.
5 Steady-state .....	350	Engine governed .....	50.

<sup>1</sup> The percent torque is relative to maximum test torque.

<sup>2</sup> Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode.

(b) The following duty cycles apply for variable-speed engines with maximum engine power below 19 kW:

(1) The following duty cycle applies for discrete-mode testing:

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G2 mode number	Engine speed <sup>1</sup>	Torque (percent) <sup>2</sup>	Weighting factors
1 .....	Maximum test speed .....	100	0.09
2 .....	Maximum test speed .....	75	0.20
3 .....	Maximum test speed .....	50	0.29
4 .....	Maximum test speed .....	25	0.30
5 .....	Maximum test speed .....	10	0.07
6 .....	Warm idle .....	0	0.05

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.

<sup>2</sup> The percent torque is relative to the maximum torque at the commanded test speed.

(2) The following duty cycle applies for ramped-modal testing:

RMC mode	Time in mode (seconds)	Engine speed <sup>1 3</sup>	Torque (percent) <sup>2 3</sup>
1a Steady-state .....	41	Warm idle .....	0.
1b Transition .....	20	Linear transition .....	Linear transition.
2a Steady-state .....	135	Maximum test speed .....	100.
2b Transition .....	20	Maximum test speed .....	Linear transition.
3a Steady-state .....	112	Maximum test speed .....	10.
3b Transition .....	20	Maximum test speed .....	Linear transition.
4a Steady-state .....	337	Maximum test speed .....	75.
4b Transition .....	20	Maximum test speed .....	Linear transition.
5a Steady-state .....	518	Maximum test speed .....	25.
5b Transition .....	20	Maximum test speed .....	Linear transition.
6a Steady-state .....	494	Maximum test speed .....	50.
6b Transition .....	20	Linear transition .....	Linear transition.
7 Steady-state .....	43	Warm idle .....	0.

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.

<sup>2</sup> The percent torque is relative to the maximum torque at the commanded engine speed.

<sup>3</sup> Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode, and simultaneously command a similar linear progression for engine speed if there is a change in speed setting.

(c) The following duty cycles apply for variable-speed engines with maximum engine power at or above 19 kW:

(1) The following duty cycle applies for discrete-mode testing:

C1 mode number	Engine speed <sup>1</sup>	Torque (percent) <sup>2</sup>	Weighting factors
1 .....	Maximum test speed .....	100	0.15
2 .....	Maximum test speed .....	75	0.15
3 .....	Maximum test speed .....	50	0.15
4 .....	Maximum test speed .....	10	0.10
5 .....	Intermediate test speed .....	100	0.10
6 .....	Intermediate test speed .....	75	0.10
7 .....	Intermediate test speed .....	50	0.10
8 .....	Warm idle .....	0	0.15

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.

<sup>2</sup> The percent torque is relative to the maximum torque at the commanded test speed.

(2) The following duty cycle applies for ramped-modal testing:

RMC mode	Time in mode (seconds)	Engine speed <sup>1 3</sup>	Torque (percent) <sup>2 3</sup>
1a Steady-state .....	126	Warm Idle .....	0.
1b Transition .....	20	Linear Transition .....	Linear Transition.
2a Steady-state .....	159	Intermediate Speed .....	100.
2b Transition .....	20	Intermediate Speed .....	Linear Transition.
3a Steady-state .....	160	Intermediate Speed .....	50.
3b Transition .....	20	Intermediate Speed .....	Linear Transition.
4a Steady-state .....	162	Intermediate Speed .....	75.
4b Transition .....	20	Linear Transition .....	Linear Transition.
5a Steady-state .....	246	Maximum Test Speed .....	100.
5b Transition .....	20	Maximum Test Speed .....	Linear Transition.
6a Steady-state .....	164	Maximum Test Speed .....	10.
6b Transition .....	20	Maximum Test Speed .....	Linear Transition.
7a Steady-state .....	248	Maximum Test Speed .....	75.
7b Transition .....	20	Maximum Test Speed .....	Linear Transition.
8a Steady-state .....	247	Maximum Test Speed .....	50.

RMC mode	Time in mode (seconds)	Engine speed <sup>1 3</sup>	Torque (percent) <sup>2 3</sup>
8b Transition .....	20	Linear Transition .....	Linear Transition.
9 Steady-state .....	128	Warm Idle .....	0.

<sup>1</sup> Speed terms are defined in 40 CFR part 1065.

<sup>2</sup> The percent torque is relative to the maximum torque at the commanded engine speed.

<sup>3</sup> Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode, and simultaneously command a similar linear progression for engine speed if there is a change in speed setting.

[69 FR 39213, June 29, 2004, as amended at 73 FR 37241, June 30, 2008]

APPENDIXES III–V TO PART 1039  
[RESERVED]

APPENDIX VI TO PART 1039—NONROAD  
COMPRESSION-IGNITION COMPOSITE  
TRANSIENT CYCLE

Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>	Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>
1 .....	0	0	50 .....	102	51
2 .....	0	0	51 .....	102	50
3 .....	0	0	52 .....	102	46
4 .....	0	0	53 .....	102	41
5 .....	0	0	54 .....	102	31
6 .....	0	0	55 .....	89	2
7 .....	0	0	56 .....	82	0
8 .....	0	0	57 .....	47	1
9 .....	0	0	58 .....	23	1
10 .....	0	0	59 .....	1	3
11 .....	0	0	60 .....	1	8
12 .....	0	0	61 .....	1	3
13 .....	0	0	62 .....	1	5
14 .....	0	0	63 .....	1	6
15 .....	0	0	64 .....	1	4
16 .....	0	0	65 .....	1	4
17 .....	0	0	66 .....	0	6
18 .....	0	0	67 .....	1	4
19 .....	0	0	68 .....	9	21
20 .....	0	0	69 .....	25	56
21 .....	0	0	70 .....	64	26
22 .....	0	0	71 .....	60	31
23 .....	0	0	72 .....	63	20
24 .....	1	3	73 .....	62	24
25 .....	1	3	74 .....	64	8
26 .....	1	3	75 .....	58	44
27 .....	1	3	76 .....	65	10
28 .....	1	3	77 .....	65	12
29 .....	1	3	78 .....	68	23
30 .....	1	6	79 .....	69	30
31 .....	1	6	80 .....	71	30
32 .....	2	1	81 .....	74	15
33 .....	4	13	82 .....	71	23
34 .....	7	18	83 .....	73	20
35 .....	9	21	84 .....	73	21
36 .....	17	20	85 .....	73	19
37 .....	33	42	86 .....	70	33
38 .....	57	46	87 .....	70	34
39 .....	44	33	88 .....	65	47
40 .....	31	0	89 .....	66	47
41 .....	22	27	90 .....	64	53
42 .....	33	43	91 .....	65	45
43 .....	80	49	92 .....	66	38
44 .....	105	47	93 .....	67	49
45 .....	98	70	94 .....	69	39
46 .....	104	36	95 .....	69	39
47 .....	104	65	96 .....	66	42
48 .....	96	71	97 .....	71	29
49 .....	101	62	98 .....	75	29
			99 .....	72	23
			100 .....	74	22
			101 .....	75	24
			102 .....	73	30
			103 .....	74	24
			104 .....	77	6
			105 .....	76	12
			106 .....	74	39
			107 .....	72	30

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Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>	Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>
108	75	22	180	1	3
109	78	64	181	1	4
110	102	34	182	1	5
111	103	28	183	1	6
112	103	28	184	1	5
113	103	19	185	1	3
114	103	32	186	1	4
115	104	25	187	1	4
116	103	38	188	1	6
117	103	39	189	8	18
118	103	34	190	20	51
119	102	44	191	49	19
120	103	38	192	41	13
121	102	43	193	31	16
122	103	34	194	28	21
123	102	41	195	21	17
124	103	44	196	31	21
125	103	37	197	21	8
126	103	27	198	0	14
127	104	13	199	0	12
128	104	30	200	3	8
129	104	19	201	3	22
130	103	28	202	12	20
131	104	40	203	14	20
132	104	32	204	16	17
133	101	63	205	20	18
134	102	54	206	27	34
135	102	52	207	32	33
136	102	51	208	41	31
137	103	40	209	43	31
138	104	34	210	37	33
139	102	36	211	26	18
140	104	44	212	18	29
141	103	44	213	14	51
142	104	33	214	13	11
143	102	27	215	12	9
144	103	26	216	15	33
145	79	53	217	20	25
146	51	37	218	25	17
147	24	23	219	31	29
148	13	33	220	36	66
149	19	55	221	66	40
150	45	30	222	50	13
151	34	7	223	16	24
152	14	4	224	26	50
153	8	16	225	64	23
154	15	6	226	81	20
155	39	47	227	83	11
156	39	4	228	79	23
157	35	26	229	76	31
158	27	38	230	68	24
159	43	40	231	59	33
160	14	23	232	59	3
161	10	10	233	25	7
162	15	33	234	21	10
163	35	72	235	20	19
164	60	39	236	4	10
165	55	31	237	5	7
166	47	30	238	4	5
167	16	7	239	4	6
168	0	6	240	4	6
169	0	8	241	4	5
170	0	8	242	7	5
171	0	2	243	16	28
172	2	17	244	28	25
173	10	28	245	52	53
174	28	31	246	50	8
175	33	30	247	26	40
176	36	0	248	48	29
177	19	10	249	54	39
178	1	18	250	60	42
179	0	16	251	48	18

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Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>	Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>
252 .....	54	51	324 .....	13	27
253 .....	88	90	325 .....	15	28
254 .....	103	84	326 .....	16	28
255 .....	103	85	327 .....	16	31
256 .....	102	84	328 .....	15	20
257 .....	58	66	329 .....	17	0
258 .....	64	97	330 .....	20	34
259 .....	56	80	331 .....	21	25
260 .....	51	67	332 .....	20	0
261 .....	52	96	333 .....	23	25
262 .....	63	62	334 .....	30	58
263 .....	71	6	335 .....	63	96
264 .....	33	16	336 .....	83	60
265 .....	47	45	337 .....	61	0
266 .....	43	56	338 .....	26	0
267 .....	42	27	339 .....	29	44
268 .....	42	64	340 .....	68	97
269 .....	75	74	341 .....	80	97
270 .....	68	96	342 .....	88	97
271 .....	86	61	343 .....	99	88
272 .....	66	0	344 .....	102	86
273 .....	37	0	345 .....	100	82
274 .....	45	37	346 .....	74	79
275 .....	68	96	347 .....	57	79
276 .....	80	97	348 .....	76	97
277 .....	92	96	349 .....	84	97
278 .....	90	97	350 .....	86	97
279 .....	82	96	351 .....	81	98
280 .....	94	81	352 .....	83	83
281 .....	90	85	353 .....	65	96
282 .....	96	65	354 .....	93	72
283 .....	70	96	355 .....	63	60
284 .....	55	95	356 .....	72	49
285 .....	70	96	357 .....	56	27
286 .....	79	96	358 .....	29	0
287 .....	81	71	359 .....	18	13
288 .....	71	60	360 .....	25	11
289 .....	92	65	361 .....	28	24
290 .....	82	63	362 .....	34	53
291 .....	61	47	363 .....	65	83
292 .....	52	37	364 .....	80	44
293 .....	24	0	365 .....	77	46
294 .....	20	7	366 .....	76	50
295 .....	39	48	367 .....	45	52
296 .....	39	54	368 .....	61	98
297 .....	63	58	369 .....	61	69
298 .....	53	31	370 .....	63	49
299 .....	51	24	371 .....	32	0
300 .....	48	40	372 .....	10	8
301 .....	39	0	373 .....	17	7
302 .....	35	18	374 .....	16	13
303 .....	36	16	375 .....	11	6
304 .....	29	17	376 .....	9	5
305 .....	28	21	377 .....	9	12
306 .....	31	15	378 .....	12	46
307 .....	31	10	379 .....	15	30
308 .....	43	19	380 .....	26	28
309 .....	49	63	381 .....	13	9
310 .....	78	61	382 .....	16	21
311 .....	78	46	383 .....	24	4
312 .....	66	65	384 .....	36	43
313 .....	78	97	385 .....	65	85
314 .....	84	63	386 .....	78	66
315 .....	57	26	387 .....	63	39
316 .....	36	22	388 .....	32	34
317 .....	20	34	389 .....	46	55
318 .....	19	8	390 .....	47	42
319 .....	9	10	391 .....	42	39
320 .....	5	5	392 .....	27	0
321 .....	7	11	393 .....	14	5
322 .....	15	15	394 .....	14	14
323 .....	12	9	395 .....	24	54

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Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>	Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>
396 .....	60	90	468 .....	93	60
397 .....	53	66	469 .....	89	73
398 .....	70	48	470 .....	86	73
399 .....	77	93	471 .....	81	73
400 .....	79	67	472 .....	78	73
401 .....	46	65	473 .....	78	73
402 .....	69	98	474 .....	76	73
403 .....	80	97	475 .....	79	73
404 .....	74	97	476 .....	82	73
405 .....	75	98	477 .....	86	73
406 .....	56	61	478 .....	88	72
407 .....	42	0	479 .....	92	71
408 .....	36	32	480 .....	97	54
409 .....	34	43	481 .....	73	43
410 .....	68	83	482 .....	36	64
411 .....	102	48	483 .....	63	31
412 .....	62	0	484 .....	78	1
413 .....	41	39	485 .....	69	27
414 .....	71	86	486 .....	67	28
415 .....	91	52	487 .....	72	9
416 .....	89	55	488 .....	71	9
417 .....	89	56	489 .....	78	36
418 .....	88	58	490 .....	81	56
419 .....	78	69	491 .....	75	53
420 .....	98	39	492 .....	60	45
421 .....	64	61	493 .....	50	37
422 .....	90	34	494 .....	66	41
423 .....	88	38	495 .....	51	61
424 .....	97	62	496 .....	68	47
425 .....	100	53	497 .....	29	42
426 .....	81	58	498 .....	24	73
427 .....	74	51	499 .....	64	71
428 .....	76	57	500 .....	90	71
429 .....	76	72	501 .....	100	61
430 .....	85	72	502 .....	94	73
431 .....	84	60	503 .....	84	73
432 .....	83	72	504 .....	79	73
433 .....	83	72	505 .....	75	72
434 .....	86	72	506 .....	78	73
435 .....	89	72	507 .....	80	73
436 .....	86	72	508 .....	81	73
437 .....	87	72	509 .....	81	73
438 .....	88	72	510 .....	83	73
439 .....	88	71	511 .....	85	73
440 .....	87	72	512 .....	84	73
441 .....	85	71	513 .....	85	73
442 .....	88	72	514 .....	86	73
443 .....	88	72	515 .....	85	73
444 .....	84	72	516 .....	85	73
445 .....	83	73	517 .....	85	72
446 .....	77	73	518 .....	85	73
447 .....	74	73	519 .....	83	73
448 .....	76	72	520 .....	79	73
449 .....	46	77	521 .....	78	73
450 .....	78	62	522 .....	81	73
451 .....	79	35	523 .....	82	72
452 .....	82	38	524 .....	94	56
453 .....	81	41	525 .....	66	48
454 .....	79	37	526 .....	35	71
455 .....	78	35	527 .....	51	44
456 .....	78	38	528 .....	60	23
457 .....	78	46	529 .....	64	10
458 .....	75	49	530 .....	63	14
459 .....	73	50	531 .....	70	37
460 .....	79	58	532 .....	76	45
461 .....	79	71	533 .....	78	18
462 .....	83	44	534 .....	76	51
463 .....	53	48	535 .....	75	33
464 .....	40	48	536 .....	81	17
465 .....	51	75	537 .....	76	45
466 .....	75	72	538 .....	76	30
467 .....	89	67	539 .....	80	14



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Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>	Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>
540 .....	71	18	612 .....	22	37
541 .....	71	14	613 .....	57	69
542 .....	71	11	614 .....	68	38
543 .....	65	2	615 .....	73	2
544 .....	31	26	616 .....	40	14
545 .....	24	72	617 .....	42	38
546 .....	64	70	618 .....	64	69
547 .....	77	62	619 .....	64	74
548 .....	80	68	620 .....	67	73
549 .....	83	53	621 .....	65	73
550 .....	83	50	622 .....	68	73
551 .....	83	50	623 .....	65	49
552 .....	85	43	624 .....	81	0
553 .....	86	45	625 .....	37	25
554 .....	89	35	626 .....	24	69
555 .....	82	61	627 .....	68	71
556 .....	87	50	628 .....	70	71
557 .....	85	55	629 .....	76	70
558 .....	89	49	630 .....	71	72
559 .....	87	70	631 .....	73	69
560 .....	91	39	632 .....	76	70
561 .....	72	3	633 .....	77	72
562 .....	43	25	634 .....	77	72
563 .....	30	60	635 .....	77	72
564 .....	40	45	636 .....	77	70
565 .....	37	32	637 .....	76	71
566 .....	37	32	638 .....	76	71
567 .....	43	70	639 .....	77	71
568 .....	70	54	640 .....	77	71
569 .....	77	47	641 .....	78	70
570 .....	79	66	642 .....	77	70
571 .....	85	53	643 .....	77	71
572 .....	83	57	644 .....	79	72
573 .....	86	52	645 .....	78	70
574 .....	85	51	646 .....	80	70
575 .....	70	39	647 .....	82	71
576 .....	50	5	648 .....	84	71
577 .....	38	36	649 .....	83	71
578 .....	30	71	650 .....	83	73
579 .....	75	53	651 .....	81	70
580 .....	84	40	652 .....	80	71
581 .....	85	42	653 .....	78	71
582 .....	86	49	654 .....	76	70
583 .....	86	57	655 .....	76	70
584 .....	89	68	656 .....	76	71
585 .....	99	61	657 .....	79	71
586 .....	77	29	658 .....	78	71
587 .....	81	72	659 .....	81	70
588 .....	89	69	660 .....	83	72
589 .....	49	56	661 .....	84	71
590 .....	79	70	662 .....	86	71
591 .....	104	59	663 .....	87	71
592 .....	103	54	664 .....	92	72
593 .....	102	56	665 .....	91	72
594 .....	102	56	666 .....	90	71
595 .....	103	61	667 .....	90	71
596 .....	102	64	668 .....	91	71
597 .....	103	60	669 .....	90	70
598 .....	93	72	670 .....	90	72
599 .....	86	73	671 .....	91	71
600 .....	76	73	672 .....	90	71
601 .....	59	49	673 .....	90	71
602 .....	46	22	674 .....	92	72
603 .....	40	65	675 .....	93	69
604 .....	72	31	676 .....	90	70
605 .....	72	27	677 .....	93	72
606 .....	67	44	678 .....	91	70
607 .....	68	37	679 .....	89	71
608 .....	67	42	680 .....	91	71
609 .....	68	50	681 .....	90	71
610 .....	77	43	682 .....	90	71
611 .....	58	4	683 .....	92	71

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Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>	Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>
684	91	71	756	103	47
685	93	71	757	102	49
686	93	68	758	102	42
687	98	68	759	102	52
688	98	67	760	102	57
689	100	69	761	102	55
690	99	68	762	102	61
691	100	71	763	102	61
692	99	68	764	102	58
693	100	69	765	103	58
694	102	72	766	102	59
695	101	69	767	102	54
696	100	69	768	102	63
697	102	71	769	102	61
698	102	71	770	103	55
699	102	69	771	102	60
700	102	71	772	102	72
701	102	68	773	103	56
702	100	69	774	102	55
703	102	70	775	102	67
704	102	68	776	103	56
705	102	70	777	84	42
706	102	72	778	48	7
707	102	68	779	48	6
708	102	69	780	48	6
709	100	68	781	48	7
710	102	71	782	48	6
711	101	64	783	48	7
712	102	69	784	67	21
713	102	69	785	105	59
714	101	69	786	105	96
715	102	64	787	105	74
716	102	69	788	105	66
717	102	68	789	105	62
718	102	70	790	105	66
719	102	69	791	89	41
720	102	70	792	52	5
721	102	70	793	48	5
722	102	62	794	48	7
723	104	38	795	48	5
724	104	15	796	48	6
725	102	24	797	48	4
726	102	45	798	52	6
727	102	47	799	51	5
728	104	40	800	51	6
729	101	52	801	51	6
730	103	32	802	52	5
731	102	50	803	52	5
732	103	30	804	57	44
733	103	44	805	98	90
734	102	40	806	105	94
735	103	43	807	105	100
736	103	41	808	105	98
737	102	46	809	105	95
738	103	39	810	105	96
739	102	41	811	105	92
740	103	41	812	104	97
741	102	38	813	100	85
742	103	39	814	94	74
743	102	46	815	87	62
744	104	46	816	81	50
745	103	49	817	81	46
746	102	45	818	80	39
747	103	42	819	80	32
748	103	46	820	81	28
749	103	38	821	80	26
750	102	48	822	80	23
751	103	35	823	80	23
752	102	48	824	80	20
753	103	49	825	81	19
754	102	48	826	80	18
755	102	46	827	81	17

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Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>	Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>
828	80	20	900	81	22
829	81	24	901	81	19
830	81	21	902	81	17
831	80	26	903	81	17
832	80	24	904	81	17
833	80	23	905	81	15
834	80	22	906	80	15
835	81	21	907	80	28
836	81	24	908	81	22
837	81	24	909	81	24
838	81	22	910	81	19
839	81	22	911	81	21
840	81	21	912	81	20
841	81	31	913	83	26
842	81	27	914	80	63
843	80	26	915	80	59
844	80	26	916	83	100
845	81	25	917	81	73
846	80	21	918	83	53
847	81	20	919	80	76
848	83	21	920	81	61
849	83	15	921	80	50
850	83	12	922	81	37
851	83	9	923	82	49
852	83	8	924	83	37
853	83	7	925	83	25
854	83	6	926	83	17
855	83	6	927	83	13
856	83	6	928	83	10
857	83	6	929	83	8
858	83	6	930	83	7
859	76	5	931	83	7
860	49	8	932	83	6
861	51	7	933	83	6
862	51	20	934	83	6
863	78	52	935	71	5
864	80	38	936	49	24
865	81	33	937	69	64
866	83	29	938	81	50
867	83	22	939	81	43
868	83	16	940	81	42
869	83	12	941	81	31
870	83	9	942	81	30
871	83	8	943	81	35
872	83	7	944	81	28
873	83	6	945	81	27
874	83	6	946	80	27
875	83	6	947	81	31
876	83	6	948	81	41
877	83	6	949	81	41
878	59	4	950	81	37
879	50	5	951	81	43
880	51	5	952	81	34
881	51	5	953	81	31
882	51	5	954	81	26
883	50	5	955	81	23
884	50	5	956	81	27
885	50	5	957	81	38
886	50	5	958	81	40
887	50	5	959	81	39
888	51	5	960	81	27
889	51	5	961	81	33
890	51	5	962	80	28
891	63	50	963	81	34
892	81	34	964	83	72
893	81	25	965	81	49
894	81	29	966	81	51
895	81	23	967	80	55
896	80	24	968	81	48
897	81	24	969	81	36
898	81	28	970	81	39
899	81	27	971	81	38

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Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>	Time(s)	Normalized speed (percent)	Normalized torque (percent) <sup>1</sup>
972 .....	80	41	1044 .....	81	43
973 .....	81	30	1045 .....	81	41
974 .....	81	23	1046 .....	79	46
975 .....	81	19	1047 .....	80	44
976 .....	81	25	1048 .....	84	20
977 .....	81	29	1049 .....	79	31
978 .....	83	47	1050 .....	87	29
979 .....	81	90	1051 .....	82	49
980 .....	81	75	1052 .....	84	21
981 .....	80	60	1053 .....	82	56
982 .....	81	48	1054 .....	81	30
983 .....	81	41	1055 .....	85	21
984 .....	81	30	1056 .....	86	16
985 .....	80	24	1057 .....	79	52
986 .....	81	20	1058 .....	78	60
987 .....	81	21	1059 .....	74	55
988 .....	81	29	1060 .....	78	84
989 .....	81	29	1061 .....	80	54
990 .....	81	27	1062 .....	80	35
991 .....	81	23	1063 .....	82	24
992 .....	81	25	1064 .....	83	43
993 .....	81	26	1065 .....	79	49
994 .....	81	22	1066 .....	83	50
995 .....	81	20	1067 .....	86	12
996 .....	81	17	1068 .....	64	14
997 .....	81	23	1069 .....	24	14
998 .....	83	65	1070 .....	49	21
999 .....	81	54	1071 .....	77	48
1000 .....	81	50	1072 .....	103	11
1001 .....	81	41	1073 .....	98	48
1002 .....	81	35	1074 .....	101	34
1003 .....	81	37	1075 .....	99	39
1004 .....	81	29	1076 .....	103	11
1005 .....	81	28	1077 .....	103	19
1006 .....	81	24	1078 .....	103	7
1007 .....	81	19	1079 .....	103	13
1008 .....	81	16	1080 .....	103	10
1009 .....	80	16	1081 .....	102	13
1010 .....	83	23	1082 .....	101	29
1011 .....	83	17	1083 .....	102	25
1012 .....	83	13	1084 .....	102	20
1013 .....	83	27	1085 .....	96	60
1014 .....	81	58	1086 .....	99	38
1015 .....	81	60	1087 .....	102	24
1016 .....	81	46	1088 .....	100	31
1017 .....	80	41	1089 .....	100	28
1018 .....	80	36	1090 .....	98	3
1019 .....	81	26	1091 .....	102	26
1020 .....	86	18	1092 .....	95	64
1021 .....	82	35	1093 .....	102	23
1022 .....	79	53	1094 .....	102	25
1023 .....	82	30	1095 .....	98	42
1024 .....	83	29	1096 .....	93	68
1025 .....	83	32	1097 .....	101	25
1026 .....	83	28	1098 .....	95	64
1027 .....	76	60	1099 .....	101	35
1028 .....	79	51	1100 .....	94	59
1029 .....	86	26	1101 .....	97	37
1030 .....	82	34	1102 .....	97	60
1031 .....	84	25	1103 .....	93	98
1032 .....	86	23	1104 .....	98	53
1033 .....	85	22	1105 .....	103	13
1034 .....	83	26	1106 .....	103	11
1035 .....	83	25	1107 .....	103	11
1036 .....	83	37	1108 .....	103	13
1037 .....	84	14	1109 .....	103	10
1038 .....	83	39	1110 .....	103	10
1039 .....	76	70	1111 .....	103	11
1040 .....	78	81	1112 .....	103	10
1041 .....	75	71	1113 .....	103	10
1042 .....	86	47	1114 .....	102	18
1043 .....	83	35	1115 .....	102	31