

## Environmental Protection Agency

## § 89.112

(11) Engines belonging to an engine family that has been certified as a constant-speed engine using the test cycle specified in Table 2 of appendix B to subpart E of this part must contain the statement on the label: "constant-speed only"; and

(12) Engines meeting the voluntary standards described in § 89.112(f)(1) to be designated as Blue Sky Series engines must contain the statement on the label: "Blue Sky Series".

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

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

[59 FR 31335, June 17, 1994. Redesignated and amended at 63 FR 56995, 57000, Oct. 23, 1998]

### **§ 89.111 Averaging, banking, and trading of exhaust emissions.**

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

[59 FR 31335, June 17, 1994. Redesignated at 63 FR 56995, Oct. 23, 1998]

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

(a) Exhaust emission from nonroad engines to which this subpart is applicable shall not exceed the applicable exhaust emission standards contained in Table 1, as follows:

Table 1.—Emission Standards (g/kW-hr)

Rated Power (kW)	Tier	Model Year <sup>1</sup>	NOx	HC	NMHC + NOx	CO	PM
kW<8	Tier 1	2000	—	—	10.5	8.0	1.0
	Tier 2	2005	—	—	7.5	8.0	0.80
8≤kW<19	Tier 1	2000	—	—	9.5	6.6	0.80
	Tier 2	2005	—	—	7.5	6.6	0.80
19≤kW<37	Tier 1	1999	—	—	9.5	5.5	0.80
	Tier 2	2004	—	—	7.5	5.5	0.60
37≤kW<75	Tier 1	1998	9.2	—	—	—	—
	Tier 2	2004	—	—	7.5	5.0	0.40
	Tier 3	2008	—	—	4.7	5.0	
75≤kW<130	Tier 1	1997	9.2	—	—	—	—
	Tier 2	2003	—	—	6.6	5.0	0.30
	Tier 3	2007	—	—	4.0	5.0	
130≤kW<225	Tier 1	1996	9.2	1.3	—	11.4	0.54
	Tier 2	2003	—	—	6.6	3.5	0.20
	Tier 3	2006	—	—	4.0	3.5	
225≤kW<450	Tier 1	1996	9.2	1.3	—	11.4	0.54
	Tier 2	2001	—	—	6.4	3.5	0.20
	Tier 3	2006	—	—	4.0	3.5	
450≤kW≤560	Tier 1	1996	9.2	1.3	—	11.4	0.54
	Tier 2	2002	—	—	6.4	3.5	0.20
	Tier 3	2006	—	—	4.0	3.5	
kW>560	Tier 1	2000	9.2	1.3	—	11.4	0.54
	Tier 2	2006	—	—	6.4	3.5	0.20

<sup>1</sup> The model years listed indicate the model years for which the specified tier of standards take effect.

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

**Environmental Protection Agency**

**§ 89.112**

(c) Exhaust emission of particulate matter is measured using the California Regulations for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines. This procedure is incorporated by reference. See §89.6.

(d) In lieu of the NO<sub>x</sub> standards, NMHC + NO<sub>x</sub> standards, and PM standards specified in paragraph (a) of this section, manufacturers may elect to in-

clude engine families in the averaging, banking, and trading program, the provisions of which are specified in subpart C of this part. The manufacturer must set a family emission limit (FEL) not to exceed the levels contained in Table 2. The FEL established by the manufacturer serves as the standard for that engine family. Table 2 follows:

Table 2.—Upper Limit for Family Emission Limits (g/kW-hr)

Rated Power (kW)	Tier	Model Year <sup>1</sup>	NO <sub>x</sub> FEL	NMHC+ NO <sub>x</sub> FEL	PM FEL
kW<8	Tier 1	2000	—	16.0	1.2
	Tier 2	2005	—	10.5	1.0
8≤kW<19	Tier 1	2000	—	16.0	1.2
	Tier 2	2005	—	9.5	0.80
19≤kW<37	Tier 1	1999	—	16.0	1.2
	Tier 2	2004	—	9.5	0.80
37≤kW<75	Tier 1	1998	14.6	—	—
	Tier 2	2004	—	11.5	1.2
	Tier 3	2008	—	7.5	—
75≤kW<130	Tier 1	1997	14.6	—	—
	Tier 2	2003	—	11.5	1.2
	Tier 3	2007	—	6.6	—
130≤kW<225	Tier 1	1996	14.6	—	—
	Tier 2	2003	—	10.5	0.54
	Tier 3	2006	—	6.6	—
225≤kW<450	Tier 1	1996	14.6	—	—
	Tier 2	2001	—	10.5	0.54
	Tier 3	2006	—	6.4	—
450≤kW≤560	Tier 1	1996	14.6	—	—
	Tier 2	2002	—	10.5	0.54
	Tier 3	2006	—	6.4	—
kW>560	Tier 1	2000	14.6	—	—
	Tier 2	2006	—	10.5	0.54

<sup>1</sup> The model years listed indicate the model years for which the specified tier of limits take effect.

(e) Naturally aspirated nonroad engines to which this subpart is applicable shall not discharge crankcase emissions into the ambient atmosphere, un-

less such crankcase emissions are permanently routed into the exhaust and included in all exhaust emission measurements. This provision applies to all

**Environmental Protection Agency**

**§ 89.114**

Tier 2 engines and later models. This provision does not apply to engines using turbochargers, pumps, blowers, or superchargers for air induction.

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

(1) *Voluntary standards.* Engines may be designated "Blue Sky Series" engines through the 2004 model year by meeting the voluntary standards listed in Table 3, which apply to all certification and in-use testing, as follows:

TABLE 3.—VOLUNTARY EMISSION STANDARDS (G/kW-HR)

Rated Brake Power (kW)	NMHC+NO <sub>x</sub>	PM
kW<8 .....	4.6	0.48
8≤kW<19 .....	4.5	0.48
19≤kW<37 .....	4.5	0.36
37≤kW<75 .....	4.7	0.24
75≤kW<130 .....	4.0	0.18
130≤kW≤560 .....	4.0	0.12
kW>560 .....	3.8	0.12

(2) *Additional standards.* Blue Sky Series engines are subject to all provisions that would otherwise apply under this part, except as specified in paragraph (f)(3) of this section.

(3) *Test procedures.* NO<sub>x</sub>, NMHC, and PM emissions are measured using the procedures set forth in 40 CFR part 86, subpart N, in lieu of the procedures set forth in subpart E of this part. CO emissions may be measured using the procedures set forth either in 40 CFR part 86, subpart N, or in Subpart E of this part. Manufacturers may use an alternate procedure to demonstrate the desired level of emission control if approved in advance by the Administrator. Engines meeting the requirements to qualify as Blue Sky Series engines must be capable of maintaining a comparable level of emission control when tested using the procedures set forth in paragraph (c) of this section and subpart E of this part. The numerical emission levels measured using the procedures from subpart E of this part may be up to 20 percent higher than those measured using the procedures from 40 CFR part 86, subpart N, and still be considered comparable.

[59 FR 31335, June 17, 1994. Redesignated and amended at 63 FR 56995, 57000, Oct. 23, 1998]

**§ 89.113 Smoke emission standard.**

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

- (1) 20 percent during the acceleration mode;
- (2) 15 percent during the lugging mode; and
- (3) 50 percent during the peaks in either the acceleration or lugging modes.

(b) Opacity levels are to be measured and calculated as set forth in 40 CFR part 86, subpart I. Notwithstanding the provisions of 40 CFR part 86, subpart I, two-cylinder nonroad engines may be tested using an exhaust muffler that is representative of exhaust mufflers used with the engines in use.

(c) The following engines are exempt from the requirements of this section:

- (1) Single-cylinder engines;
- (2) Propulsion marine diesel engines; and
- (3) Constant-speed engines.

[59 FR 31335, June 17, 1994. Redesignated and amended at 63 FR 56995, 57003, Oct. 23, 1998]

**§ 89.114 Special and alternate test procedures.**

(a) *Special test procedures.* The Administrator may, on the basis of written application by a manufacturer, establish special test procedures other than those set forth in this part, for any nonroad engine that the Administrator determines is not susceptible to satisfactory testing under the specified test procedures set forth in subpart E of this part or 40 CFR part 86, subpart I.

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

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

[59 FR 31335, June 17, 1994. Redesignated and amended at 63 FR 56995, 57003, Oct. 23, 1998]