

**§ 86.007-38 Maintenance instructions.**

This section includes text that specifies requirements that differ from those specified in § 86.096-38 or § 86.004-38. Where a paragraph in § 86.096-38 or § 86.004-38 is identical and applicable to § 86.007-38, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.096-38., or [Reserved]. For guidance see § 86.004-38.”

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

(g) [Reserved]. For guidance see § 86.096-38. For incorporation by reference see §§ 86.1 and 86.096-38.

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

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

[66 FR 5165, Jan. 18, 2001, as amended at 68 FR 38455, June 27, 2003]

EFFECTIVE DATE NOTE: At 69 FR 39212, June 29, 2004, § 86.007-38 was amended by revising paragraph (i) effective August 30, 2004. For the convenience of the user, the revised text is set forth as follows:

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

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

Section 86.008-10 includes text that specifies requirements that differ from § 86.098-10, § 86.099-10, § 86.005-10. Where a paragraph in § 86.098-10, § 86.099-10, or § 86.005-10 is identical and applicable to § 86.008-10, this may be indicated by specifying the corresponding paragraph

and the statement “[Reserved]. For guidance see § 86.098-10.”, “[Reserved]. For guidance see § 86.099-10.”, or “[Reserved]. For guidance see § 86.005-10.”

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

(i)(A) *Oxides of Nitrogen plus Non-methane Hydrocarbons (NO<sub>x</sub> + NMHC) for engines fueled with either gasoline, natural gas, or liquefied petroleum gas.* 1.0 grams per brake horsepower-hour (0.37 grams per megajoule).

(B) *Oxides of Nitrogen plus Non-methane Hydrocarbon Equivalent (NO<sub>x</sub> + NMHCE) for engines fueled with methanol.* 1.0 grams per brake horsepower-hour (0.37 grams per megajoule).

(a)(1)(i)(C)-(a)(3)(ii) [Reserved]. For guidance see § 86.005-10.

(4) [Reserved]

(b) [Reserved]. For guidance see § 86.099-10.

(c) [Reserved]. For guidance see § 86.098-10.

(d) [Reserved]. For guidance see § 86.005-10.

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

(f) [Reserved]

[65 FR 59955, Oct. 6, 2000]

EDITORIAL NOTE: At 66 FR 5165, Jan. 18, 2001, § 86.008-10 was added. However, § 86.008-10 already existed. For the convenience of the user, the second § 86.008-10 is set forth as follows:

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

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

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

(i)(A) *Oxides of Nitrogen (NO<sub>x</sub>).* 0.20 grams per brake horsepower-hour (0.075 grams per megajoule).

(B) A manufacturer may elect to include any or all of its Otto-cycle HDE families in any or all of the NO<sub>x</sub> and NO<sub>x</sub> plus NMHC emissions ABT programs for HDEs, within the restrictions described in § 86.008-15 or § 86.004-15. If the manufacturer elects to include engine families in any of these programs, the NO<sub>x</sub> FEL may not exceed 0.50 grams per brake horsepower-hour (0.26 grams

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per megajoule). This ceiling value applies whether credits for the family are derived from averaging, banking, or trading programs. The NO<sub>x</sub> FEL cap is 0.80 for model years before 2011 for manufacturers choosing to certify to the 1.5 g/bhp-hr NO<sub>x</sub>+NMHC standard in 2003 or 2004, in accordance with § 86.005-10(f).

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

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

(C) A manufacturer may elect to include any or all of its Otto-cycle HDE families in any or all of the NMHC emissions ABT programs for HDEs, within the restrictions described in § 86.008-15 or § 86.004-15. If the manufacturer elects to include engine families in any of these programs, the NMHC FEL may not exceed 0.30 grams per brake horsepower-hour. This ceiling value applies whether credits for the family are derived from averaging, banking, or trading programs. The NMHC FEL cap is 0.40 for model years before 2011 for manufacturers choosing to certify to the 1.5 g/bhp-hr NO<sub>x</sub>+NMHC in 2004, as allowed in § 86.005-10.

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

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

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

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

(3)-(4) [Reserved]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs., the standards set forth in paragraphs (b)(1)(ii)

and (b)(2)(ii) of this section refer to the manufacturer's engineering design evaluation using good engineering practice (a statement of which is required in § 86.098-23(b)(4)(ii)).

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

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

(d) Every manufacturer of new motor vehicle engines subject to the standards prescribed in this section shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with applicable procedures in subpart N or P of this part to ascertain that such test engines meet the requirements of this section.

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

(f) Phase-in options. (1)(i) For model year 2008, manufacturers may certify some of their engine families to the exhaust standards applicable to model year 2007 engines under § 86.005-10, in lieu of the exhaust standards specified in this section. These engines must comply with all other requirements applicable to model year 2008 engines, except as allowed by paragraph (f)(1)(ii) of this section. The combined number of engines in the engine families certified to the 2007 combined NO<sub>x</sub> plus NMHC standard may not exceed 50 percent of the manufacturer's U.S.-directed production of heavy-duty Otto-cycle motor vehicle engines for model year 2008, except as explicitly allowed by paragraph (f)(2) of this section.

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

(2)(i) Manufacturers certifying engines to all of the applicable exhaust standards listed in paragraph (a) of this section prior to model year 2008 (without using credits) may reduce the number of engines that are required to meet the NO<sub>x</sub> and NMHC exhaust standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (f)(1) of this section. For every engine that is certified early, the manufacturer

may reduce the number of engines that are required by paragraph (f)(1) of this section to meet the NO<sub>x</sub> and NMHC standards listed in paragraph (a) of this section by one engine. For example, if a manufacturer produces 100 heavy-duty Otto-cycle engines in 2007 that meet all of the applicable standards listed in paragraph (a) of this section, and it produced 10,000 heavy-duty Otto-cycle engines in 2009, then only 9,900 of the engines would need to comply with the NO<sub>x</sub> and NMHC standards listed in paragraph (a) of this section.

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

(3) Manufacturers certifying engines to a voluntary NO<sub>x</sub> standard of 0.10 g/bhp-hr (without using credits) in addition to all of the applicable standards listed in paragraphs (a) and (b) of this section prior to model year 2008 may reduce the number of engines that are required to meet the NO<sub>x</sub> and NMHC standards listed in paragraph (a) of this section in model year 2008 and/or 2009, taking into account the phase-in option provided in paragraph (f)(1) of this section. For such every engine that is certified early, the manufacturer may reduce the number of engines that are required by paragraph (f)(1) of this section to meet the NO<sub>x</sub> and NMHC standards listed in paragraph (a) of this section by two engines.

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

#### § 86.078-3 Abbreviations.

(a) The abbreviations in this section apply to this subpart and also to subparts B, D, H, I, J, N, O and P of this part and have the following meanings:

accel.—acceleration.

AECD—Auxiliary emission control device.

API—American Petroleum Institute.

ASTM—American Society for Testing and Materials.

BHP—Brake horsepower.