§ 86.008–10

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 § 86.099–10. 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\textsubscript{X}). 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\textsubscript{X} and NO\textsubscript{X} 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\textsubscript{X} FEL may not exceed 0.50 grams per brake horsepower-hour (0.26 grams per megajoule). This ceiling value applies whether credits for the family are derived from averaging, banking, or trading programs. The NO\textsubscript{X} FEL cap is 0.80 for model years before 2011 for manufacturers choosing to certify to the 1.5 g/bhp-hr NO\textsubscript{X}+NMHC in 2004, as allowed in §86.005–10.

(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 (0.052 grams per megajoule).

(B) Non-methane Hydrocarbon Equivalent (NMHCE) for engines fueled with methanol. 0.14 grams per brake horsepower-hour (0.052 grams 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\textsubscript{X}+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. 0.01 grams per brake horsepower-hour (0.0037 grams 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.

(i) Perform the test interval set forth in paragraph (f)(1) of Appendix I of this part with a cold-start according to 40 CFR part 1065, subpart F. This is the cold-start test interval.

(ii) Shut down the engine after completing the test interval and allow 20 minutes to elapse. This is the hot soak.

(iii) Repeat the test interval. This is the hot-start test interval.

(iv) Calculate the total emission mass of each constituent, \( m \), and the total work, \( W \), over each test interval according to 40 CFR 1065.650.

(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

\[
\text{Brake-specific emissions} = \frac{m_{\text{cold-start}} + m_{\text{hot-start}}}{W_{\text{cold-start}} + W_{\text{hot-start}}}
\]

(3)(4) [Reserved]
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 gase-fueled engines). 

(i) For vehicles with a Gross Vehicle Weight Rating of up to 14,000 lbs:
   (A) For the full three-diurnal test sequence described in §86.1230–96, diurnal plus hot soak measurements: 1.4 grams 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) For the full three-diurnal test sequence described in §86.1230–96, diurnal plus hot soak measurements: 1.9 grams carbon per test.
   (B) Running loss test: 0.05 grams carbon per mile.

(ii) For vehicles with a Gross Vehicle Weight Rating of greater than 26,000 lbs.:
   (A) 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.
   (B) 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)).

(3) 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) For the full three-diurnal test sequence described in §86.1230–96, diurnal plus hot soak measurements: 1.4 grams per test.
   (B) Running loss test: 1.0 grams carbon per test.

(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 NOX 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) 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 NOX 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 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.

(ii) Manufacturers certifying engines to a voluntary NOX 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 NOX 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 evaporative standards listed in paragraph (b) of this section by one engine.

(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 NOX FEL no higher than 0.50 g/bhp-hr, the applicable compliance limits for NOX and NMHC shall be determined by adding 0.10 g/bhp-hr to the otherwise applicable standards or FELs for NOX and NMHC.


§86.010–2 Definitions.

The definitions of §86.004-2 continue to apply to 2004 and later model year vehicles. The definitions listed in this