to be certified, deterioration data from the on-highway engine may be applied to the nonroad engine. This application of deterioration data from an on-highway engine to a nonroad engine is subject to Administrator approval, and the determination of whether the engines are similar must be based on good engineering judgment.

(iii) Engineering analysis for established technologies. (A) In the case where an engine family uses established technology, an analysis based on good engineering practices may be used in lieu of testing to determine a deterioration factor for that engine family, subject to Administrator approval.

(B) Engines for which the certification levels are not at or below the Tier 3 NMHC+NO\textsubscript{X} standards described in §89.112 are considered established technology, except as provided in paragraph (e)(3)(iii)(D) of this section.

(C) Manufacturers may petition the Administrator to consider an engine with a certification level below the Tier 3 +NO\textsubscript{X} standards as established technology. This petition must be based on proof that the technology used is not significantly different than that used on engines that have certification levels that are not below the Tier 3 NMHC+NO\textsubscript{X} levels.

(D) Engines using exhaust gas recirculation or aftertreatment are excluded from the provision set forth in paragraphs (e)(3)(iii)(A) through (e)(3)(iii)(C) of this section.

(E) The manufacturer shall provide a written statement to the Administrator that all data, analyses, test procedures, evaluations, and other documents, on which the deterioration factor is based, are available to the Administrator upon request.

(iv) Interim provision for engines rated under 37 kW. For model year 1999 and 2000 engines rated under 37 kW, manufacturers may determine deterioration factors based on good engineering judgement and reasonably available information. The manufacturer must maintain and provide to the Administrator, if requested, all information used to determine deterioration factors for these engines.

\[ PM_{adj} = PM - [BSFC \times 0.0917 \times (FSF - 0.0005)] \]

Where:

\[ BSFC \]

\[ FSF \]

\[ PM \]

\[ PM_{adj} \]

\[ 0.0917 \]

\[ 0.0005 \]

\[ 0.05 \text{ weight percent} \]

\[ \text{sulfur content} \]
§ 89.120 Compliance with emission standards.

(a) If all test engines representing an engine family have emissions less than or equal to each emission standard, that family complies with the emission standards.

(b) If any test engine representing an engine family has emissions greater than each emission standard, that family will be deemed not in compliance with the emission standard(s).

(c) For each nonroad engine family, except Tier 1 engine families with rated power at or above 37 kW that do not employ aftertreatment, a deterioration factor must be determined and applied.

(1) The applicable exhaust emission standards (or family emission limits, as appropriate) for nonroad compression-ignition engines apply to the emissions of engines for their useful life.

(2) [Reserved]

(3)(i) This paragraph (c)(3) describes the procedure for determining compliance of an engine with emission standards (or family emission limits, as appropriate), based on deterioration factors supplied by the manufacturer. The NMHC + NO\textsubscript{X} deterioration factors shall be established based on the sum of the pollutants, except as provided in paragraph (c)(3)(iv) of this section. When establishing deterioration factors for NMHC + NO\textsubscript{X}, a negative deterioration (emissions decrease from the official emissions test result) for one pollutant may not offset deterioration of the other pollutant.

(ii) Separate emission deterioration factors, determined by the manufacturer according to the requirements of §89.118, shall be provided in the certification application for each engine-system combination. Separate deterioration factors shall be established for each regulated pollutant, except that a combined NMHC + NO\textsubscript{X} deterioration factor shall be established for compression-ignition nonroad engines not utilizing aftertreatment technology. For smoke testing, separate deterioration factors shall also be established for the acceleration mode (designated as “A”), the lugging mode (designated as “B”), and peak opacity (designated as “C”).

(iii) Compression-ignition nonroad engines not utilizing aftertreatment technology (e.g., particulate traps). For CO, NMHC + NO\textsubscript{X}, and particulate, the official exhaust emission results for each emission data engine at the selected test point shall be adjusted by addition of the appropriate deterioration factor. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall be zero for the purposes of this paragraph (c)(3)(iii).

(iv) Compression-ignition nonroad engines utilizing aftertreatment technology (e.g., particulate traps). For CO, NMHC + NO\textsubscript{X}, and particulate, the official exhaust emission results for each emission data engine at the selected test point shall be adjusted by multiplication by the appropriate deterioration factor. Separate NMHC and NO\textsubscript{X} deterioration factors shall be applied to the results for these pollutants prior to combining the results. If the deterioration factor supplied by the manufacturer is less than one, it shall be one for the purposes of this paragraph (c)(3)(iv).

(v) For acceleration smoke (“A”), lugging smoke (“B”), and peak opacity (“C”), the official exhaust emission results for each emission data engine at...