



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY
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ANN ARBOR, MICHIGAN 48105-2498

OFFICE OF
AIR AND RADIATION

July 20, 2020

CD-2020-11 (NRCI)

SUBJECT: Assigned Deterioration Factors for Small-Volume Engine Manufacturers of Nonroad Compression-Ignition Engines

Dear Manufacturer:

The purpose of this letter is to provide small-volume engine manufacturers of nonroad compression-ignition (NRCI) engines with EPA assigned deterioration factors (ADFs) for determining compliance with applicable emission standards in 40 CFR Part 1039. The ADFs are enclosed in Table 1 below and are effective immediately.

Applicability

The ADFs provided in Table 1 may be used for all new, NRCI engines by small-volume engine manufacturers electing to use EPA ADFs to demonstrate compliance with the Tier 4 NRCI engine emission standards. 40 CFR §§ 1039.240(c), 1039.801 (definition of “small-volume engine manufacturer”).

Methodology

The ADFs in Table 1 are based on an analysis that ranks the manufacturers’ multiplicative DFs based upon magnitude and utilizes the 70th percentile value. Prior to calculating the 70th percentile values, the DFs were organized by power category and test cycle. The data was filtered further by comparing values by component between the test cycles and mathematical application to determine the most conservative value. Thus, the ADFs provided in Table 1 are multiplicative for either cycle but may be converted to the other mathematical application if appropriate.

The data used for developing the ADFs are derived from records for model year (MY) 2018. The MY was selected to correspond with current values from engines utilizing modern technology. Due to manufacturers applying carry-over DFs for engine families, the single MY was selected to model the data to eliminate duplicate DFs.

If you have any questions, please contact Allen Duncan at Duncan.allen@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Byron J. Bunker". The signature is fluid and cursive, with a long horizontal stroke at the end.

Byron J. Bunker, Director
Compliance Division
Office of Transportation and Air Quality

Enclosure

Enclosure to CD-2020-11
Table 1 –Nonroad Compression-Ignition Engine ADFs

Power Category	Application	PM	NMHC	NO_x	CO
kW < 19	Multiplicative	1.18	1.22	1.03	2.59
19 ≤ kW < 56	Multiplicative	1.14	2.83	1.00	2.22
56 ≤ kW < 130	Multiplicative	1.10	2.39	1.19	1.93
130 ≤ kW < 560	Multiplicative	1.12	1.73	1.12	2.46
kW ≥ 560	Multiplicative	1.13	2.04	1.13	1.46