
40 C.F.R. § 86.1819-14

Greenhouse gas emission standards for medium-duty and heavy-duty vehicles.

This section describes exhaust emission standards for CO₂, CH₄, and N₂O for medium-duty vehicles. The standards of this section apply for model year 2014 and later vehicles that are chassis-certified with respect to criteria pollutants under this subpart S. Additional medium-duty and heavy-duty vehicles may be subject to the standards of this section as specified in paragraph (j) of this section. Any medium-duty or heavy-duty vehicles not subject to standards under this section are instead subject to greenhouse gas standards under 40 CFR part 1037, and engines installed in these vehicles are subject to standards under 40 CFR part 1036. If you are not the engine manufacturer, you must notify the engine manufacturer that its engines are subject to 40 CFR part 1036 if you intend to use their engines in vehicles that are not subject to standards under this section. Vehicles produced by small businesses may be exempted from the standards of this section as described in paragraph (k)(5) of this section.

(a) *Fleet-average CO₂ emission standards.* Fleet-average CO₂ emission standards apply for the full useful life for each manufacturer as follows:

(1) Calculate a work factor, *WF*, for each vehicle subconfiguration (or group of subconfigurations as allowed under paragraph (a)(4) of this section), rounded to the nearest pound, using the following equation:

$$WF = 0.75 \times (GVWR - \text{Curb Weight} + xwd) + 0.25 \times (GCWR - GVWR)$$

Where:

xwd = 500 pounds if the vehicle has four-wheel drive or all-wheel drive; *xwd* = 0 pounds for all other vehicles.

(2) CO₂ target values apply as described in this paragraph (a)(2) for model year 2032 and later. See paragraph (k)(4) of this section for model year 2031 and earlier:

(i) For vehicles with work factor at or below 5,500 pounds, use the appropriate work factor in the following equation to calculate a target value for each vehicle subconfiguration (or group of subconfigurations as allowed under paragraph (a)(4) of this section), rounding to the nearest whole g/mile:

$$CO_2\text{Target} = 0.0221 \times WF + 170$$

(ii) For vehicles with work factor above 5,500 pounds, the CO₂ target value is 292 g/mile.

(3) Calculate a production-weighted average of the target values and round it to the nearest whole g/mile. This is your fleet-average standard. All vehicles subject to the standards of this section form a single averaging set. Use the following equation to calculate your fleet-average standard from the target value for each vehicle subconfiguration (*Target_i*) and U.S.-directed production volume of each vehicle

subconfiguration for the given model year ($Volume_i$):

$$\text{Fleet-Average Standard} = \frac{\sum[\text{Target}_i \times \text{Volume}_i]}{\sum[\text{Volume}_i]}$$

(4) You may group subconfigurations within a configuration together for purposes of calculating your fleet-average standard as follows:

(i) You may group together subconfigurations that have the same equivalent test weight (ETW), GVWR, and GCWR. Calculate your work factor and target value assuming a curb weight equal to two times ETW minus GVWR.

(ii) You may group together other subconfigurations if you use the lowest target value calculated for any of the subconfigurations.

(5) The standards specified in this section apply for testing at both low-altitude conditions and high-altitude conditions. However, manufacturers must submit an engineering evaluation indicating that common calibration approaches are utilized at high altitude instead of performing testing for certification, consistent with § 86.1829. Any deviation from low altitude emission control practices must be included in the auxiliary emission control device (AECD) descriptions submitted at certification. Any AECD specific to high altitude requires engineering emission data for EPA evaluation to quantify any emission impact and determine the validity of the AECD.

(b) *Production and in-use CO₂ standards.* Each vehicle you produce that is subject to the standards of this section has an “in-use” CO₂ standard that is calculated from your test result and that applies for selective enforcement audits and in-use testing. This in-use CO₂ standard for each vehicle is equal to the applicable deteriorated emission level multiplied by 1.10 and rounded to the nearest whole g/mile.

(c) *N₂O and CH₄ standards.* Except as allowed under this paragraph (c), all vehicles subject to the standards of this section must comply with an N₂O standard of 0.05 g/mile and a CH₄ standard of 0.05 g/mile when calculated according to the provisions of paragraph (d)(4) of this section. You may specify CH₄ and/or N₂O alternative standards using CO₂ emission credits instead of these otherwise applicable emission standards for one or more test groups. To do this, calculate the CH₄ and/or N₂O emission credits needed (negative credits) using the equation in this paragraph (c) based on the FEL(s) you specify for your vehicles during certification. You must adjust the calculated emissions by the global warming potential (GWP): GWP equals 34 for CH₄ from model year 2021 and later vehicles, 25 for CH₄ from earlier vehicles, and 298 for N₂O. This means, for example, that you must use 298 Mg of positive CO₂ credits to offset 1 Mg of negative N₂O credits. Note that § 86.1818-12(f) does not apply for vehicles subject to the standards of this section. Calculate credits using the following equation, rounded to the nearest whole number:

$$\text{CO}_2\text{Credits Needed (Mg)} = [(FEL - Std) \times (U.S.-directed\ production\ volume) \times (Useful\ Life)] \times (GWP) \div 1,000,000$$

(d) *Compliance provisions.* The following compliance provisions apply instead of other provisions described in this subpart S:

(1) The CO₂ standards of this section apply with respect to CO₂ emissions, not with respect to carbon-related exhaust emissions (CREE).

(2) The following general credit provisions apply:

(i) Credits you generate under this section may be used only to offset credit deficits under this section. You may bank credits for use in a future model year in which your average CO₂ level exceeds the standard. You may trade credits to another manufacturer according to § 86.1865-12(k)(8). Before you bank or trade credits, you must apply any available credits to offset a deficit if the deadline to offset that credit deficit has not yet passed.

(ii) Vehicles subject to the standards of this section are included in a single greenhouse gas averaging set separate from any averaging set otherwise included in this subpart S.

(iii) Banked CO₂ credits keep their full value for five model years after the year in which they were generated. Unused credits may not be used for more than five model years after the model year in which the credits are generated.

(3) Special credit and incentive provisions related to air conditioning in §§ 86.1867 and 86.1868 do not apply for vehicles subject to the standards of this section.

(4) Measure emissions using the procedures of subpart B of this part and 40 CFR part 1066. Determine separate emission results for the Federal Test Procedure (FTP) described in 40 CFR 1066.801(c)(1) and the Highway Fuel Economy Test (HFET) described in 40 CFR 1066.801(c)(3). Calculate composite emission results from these two test cycles for demonstrating compliance with the CO₂, N₂O, and CH₄ standards based on a weighted average of the FTP (55%) and HFET (45%) emission results. Note that this differs from the way the criteria pollutant standards apply.

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