under § 529.5(b), as appropriate, is considered the manufacturer of the completed automobile for the purpose of the requirements of Title V and rules issued thereunder, other than those in part 537, Fuel Economy Reports.

(b) Each final-stage manufacturer that becomes the manufacturer of a multistage automobile under paragraph (a) of this section shall, within 10 days after completing its manufacturing operations on that automobile, send written notification of its exceeding the curb weight or frontal area maximum to the Administrator of the Environmental Protection Agency and to the manufacturer previously considered under this part to be the manufacturer of the automobile.

(c)(1) If the final-stage manufacturer becomes the manufacturer of a multistage automobile under paragraph (a)(1) of this section, that manufacturer shall prepare a new fuel economy label for that automobile in accordance with 40 CFR part 600.

(2) If the final-stage manufacturer places the portion of the body including the windshield and front seat side windows on the incomplete automobile, that manufacturer shall attach the fuel economy label furnished by the incomplete automobile manufacturer under § 529.4(c)(2) or by the last intermediate manufacturer under § 529.5(d)(2) or the fuel economy label prepared by the final-stage manufacturer under paragraph (c)(1) of this section, as appropriate, to that automobile in accordance with 40 CFR part 600.

(3) The final-stage manufacturer shall attach to the completed automobile in accordance with 40 CFR part 600 a fuel economy label identical to the label that is required under this part to have been prepared by the manufacturer considered under this part to be the manufacturer of that automobile if:

(i) The portion of the body including the windshield and front seat side windows was added to the completed automobile by a previous manufacturer;

(ii) The final-stage manufacturer's manufacturing operations do not cause that automobile to exceed either of the maxima specified in paragraph (c)(1) of this section; and

(iii) That fuel economy label is not on that automobile when received by that manufacturer or is removed from that automobile while it is in the possession of that manufacturer.

# PART 531—PASSENGER AUTOMOBILE AVERAGE FUEL ECONOMY STANDARDS

## § 531.1  Scope.

This part establishes average fuel economy standards pursuant to 49 U.S.C. 32902 for passenger automobiles.

[89 FR 52945, June 24, 2024]

## § 531.2  Purpose.

The purpose of this part is to increase the fuel economy of passenger automobiles by establishing minimum levels of average fuel economy for those vehicles.

## § 531.3  Applicability.

This part applies to manufacturers of passenger automobiles.

## § 531.4  Definitions.

(a) *Statutory terms.* (1) The terms *average fuel economy*, *manufacture*, *manufacturer*, and *model year* are used as defined in 49 U.S.C. 32901.

(2) The terms *automobile* and *passenger automobile* are used as defined in 49 U.S.C. 32901 and in accordance with the determination in part 523 of this chapter.

(b) *Other terms.* As used in this part, unless otherwise required by the context—

(1) The term *domestically manufactured passenger automobile* means the vehicle is deemed to be manufactured

domestically under 49 U.S.C. 32904(b)(3) and 40 CFR 600.511–08.

(2) [Reserved]

### § 531.5   Fuel economy standards.

(a) Except as provided in paragraph (e) of this section, each manufacturer of passenger automobiles shall comply with the fleet average fuel economy standards in table 1 to this paragraph (a), expressed in miles per gallon, in the model year specified as applicable:

TABLE 1 TO PARAGRAPH (a)

| Model year | Average fuel economy standard (miles per gallon) |
|---|---|
| 1978 | 18.0 |
| 1979 | 19.0 |
| 1980 | 20.0 |

TABLE 1 TO PARAGRAPH (a)—Continued

| Model year | Average fuel economy standard (miles per gallon) |
|---|---|
| 1981 | 22.0 |
| 1982 | 24.0 |
| 1983 | 26.0 |
| 1984 | 27.0 |
| 1985 | 27.5 |
| 1986 | 26.0 |
| 1987 | 26.0 |
| 1988 | 26.0 |
| 1989 | 26.5 |
| 1990–2010 | 27.5 |

(b) Except as provided in paragraph (e) of this section, for model year 2011, a manufacturer's passenger automobile fleet shall comply with the fleet average fuel economy level calculated for that model year according to figure 1 and the appropriate values in table 2 to this paragraph (b).

**Figure 1 to Paragraph (b)**

$$Required\_Fuel\_Economy\_Level = \frac{N}{\sum_i \frac{N_i}{T_i}}$$

Where:

$N$ is the total number (sum) of passenger automobiles produced by a manufacturer;

$N_i$ is the number (sum) of the *ith* passenger automobile model produced by the manufacturer; and

$T_i$ is the fuel economy target of the *ith* model passenger automobile, which is determined according to the following formula, rounded to the nearest hundredth:

$$\frac{1}{\frac{1}{a} + \left(\frac{1}{b} - \frac{1}{a}\right)\frac{e^{(x-c)d}}{1 + e^{(x-c)d}}}$$

Where:

Parameters $a$, $b$, $c$, and $d$ are defined in table 2 to this paragraph (b);

$e$ = 2.718; and

$x$ = footprint (in square feet, rounded to the nearest tenth) of the vehicle model.

TABLE 2 TO PARAGRAPH (b)— PARAMETERS FOR THE PASSENGER AUTOMOBILE FUEL ECONOMY TARGETS

| Model year | | | | Parameters |
|---|---|---|---|---|
| a (mpg) | b (mpg) | c (gal/mi/ft2) | d (gal/mi) | |
| 2011 | 31.20 | 24.00 | 51.41 | 1.91 |

(c) Except as provided in paragraph (e) of this section, for model years 2012–2031, a manufacturer's passenger automobile fleet shall comply with the fleet average fuel economy level calculated for that model year according to this figure 2 and the appropriate values in this table 3 to this paragraph (c).

**Figure 2 to Paragraph (c)**

$$CAFE_{required} = \frac{\sum_i PRODUCTION_i}{\sum_i \dfrac{PRODUCTION_i}{TARGET_i}}$$

Where:

$CAFE_{required}$ is the fleet average fuel economy standard for a given fleet (domestic passenger automobiles or import passenger automobiles);

Subscript $i$ is a designation of multiple groups of automobiles, where each group's designation, *i.e.*, $i$ = 1, 2, 3, etc., represents automobiles that share a unique model type and footprint within the applicable fleet, either domestic passenger automobiles or import passenger automobiles;

$Production_i$ is the number of passenger automobiles produced for sale in the United States within each *ith* designation, *i.e.*, which share the same model type and footprint;

$TARGET_i$ is the fuel economy target in miles per gallon (mpg) applicable to the footprint of passenger automobiles within each *ith* designation, *i.e.*, which share the same model type and footprint, calculated according to figure 3 to this paragraph (c) and rounded to the nearest hundredth of a mpg, *i.e.*, 35.455 = 35.46 mpg, and the summations in the numerator and denominator are both performed over all models in the fleet in question.

**Figure 3 to Paragraph (c)**

$$TARGET = \frac{1}{MIN\left[MAX\left(c \times FOOTPRINT + d, \dfrac{1}{a}\right), \dfrac{1}{b}\right]}$$

Where:

$TARGET$ is the fuel economy target (in mpg) applicable to vehicles of a given footprint (*FOOTPRINT*, in square feet);

Parameters $a$, $b$, $c$, and $d$ are defined in table 3 to this paragraph (c); and

The *MIN* and *MAX* functions take the minimum and maximum, respectively, of the included values.

TABLE 3 TO PARAGRAPH (c)—PARAMETERS FOR THE PASSENGER AUTOMOBILE FUEL ECONOMY TARGETS, MYS 2012–2031

| Model year | Parameters | | | |
|---|---|---|---|---|
| | a (mpg) | b (mpg) | c (gal/mi/ft2) | d (gal/mi) |
| 2012 ............................................................... | 35.95 | 27.95 | 0.0005308 | 0.006057 |
| 2013 ............................................................... | 36.80 | 28.46 | 0.0005308 | 0.005410 |
| 2014 ............................................................... | 37.75 | 29.03 | 0.0005308 | 0.004725 |
| 2015 ............................................................... | 39.24 | 29.90 | 0.0005308 | 0.003719 |
| 2016 ............................................................... | 41.09 | 30.96 | 0.0005308 | 0.002573 |
| 2017 ............................................................... | 43.61 | 32.65 | 0.0005131 | 0.001896 |
| 2018 ............................................................... | 45.21 | 33.84 | 0.0004954 | 0.001811 |
| 2019 ............................................................... | 46.87 | 35.07 | 0.0004783 | 0.001729 |
| 2020 ............................................................... | 48.74 | 36.47 | 0.0004603 | 0.001643 |
| 2021 ............................................................... | 49.48 | 37.02 | 0.000453 | 0.00162 |

TABLE 3 TO PARAGRAPH (c)—PARAMETERS FOR THE PASSENGER AUTOMOBILE FUEL ECONOMY TARGETS, MYs 2012–2031—Continued

| Model year | Parameters | | | |
|---|---|---|---|---|
| | a (mpg) | b (mpg) | c (gal/mi/ft2) | d (gal/mi) |
| 2022 | 50.24 | 37.59 | 0.000447 | 0.00159 |
| 2023 | 51.00 | 38.16 | 0.000440 | 0.00157 |
| 2024 | 55.44 | 41.48 | 0.000405 | 0.00144 |
| 2025 | 60.26 | 45.08 | 0.000372 | 0.00133 |
| 2026 | 66.95 | 50.09 | 0.000335 | 0.00120 |
| 2027 | 68.32 | 51.12 | 0.00032841 | 0.00117220 |
| 2028 | 69.71 | 52.16 | 0.00032184 | 0.00114876 |
| 2029 | 71.14 | 53.22 | 0.00031541 | 0.00112579 |
| 2030 | 72.59 | 54.31 | 0.00030910 | 0.00110327 |
| 2031 | 74.07 | 55.42 | 0.00030292 | 0.00108120 |

(d) In addition to the requirements of paragraphs (b) and (c) of this section, each manufacturer, other than manufacturers subject to standards in paragraph (e) of this section, shall also meet the minimum fleet standard for domestically manufactured passenger automobiles expressed in table 4 to this paragraph (d):

TABLE 4 TO PARAGRAPH (d)—MINIMUM FUEL ECONOMY STANDARDS FOR DOMESTICALLY MANUFACTURED PASSENGER AUTOMOBILES, MYs 2011–2031

| Model year | Minimum standard |
|---|---|
| 2011 | 27.8 |
| 2012 | 30.7 |
| 2013 | 31.4 |
| 2014 | 32.1 |
| 2015 | 33.3 |
| 2016 | 34.7 |
| 2017 | 36.7 |
| 2018 | 38.0 |
| 2019 | 39.4 |
| 2020 | 40.9 |
| 2021 | 39.9 |
| 2022 | 40.6 |
| 2023 | 41.1 |
| 2024 | 44.3 |
| 2025 | 48.1 |
| 2026 | 53.5 |
| 2027 | 54.2 |
| 2028 | 55.2 |
| 2029 | 56.4 |
| 2030 | 57.5 |
| 2031 | 58.7 |

(e) The following manufacturers shall comply with the standards indicated in paragraphs (e)(1) through (15) of this section for the specified model years:

(1) *Avanti Motor Corporation.*

TABLE 5 TO § 531.5(e)(1)—AVERAGE FUEL ECONOMY STANDARDS

| Model year | Miles per gallon |
|---|---|
| 1978 | 16.1 |
| 1979 | 14.5 |
| 1980 | 15.8 |
| 1981 | 18.2 |
| 1982 | 18.2 |
| 1983 | 16.9 |
| 1984 | 16.9 |
| 1985 | 16.9 |

(2) *Rolls-Royce Motors, Inc.*

TABLE 6 TO § 531.5(e)(2)—AVERAGE FUEL ECONOMY STANDARDS

| Model year | Miles per gallon |
|---|---|
| 1978 | 10.7 |
| 1979 | 10.8 |
| 1980 | 11.1 |
| 1981 | 10.7 |
| 1982 | 10.6 |
| 1983 | 9.9 |
| 1984 | 10.0 |
| 1985 | 10.0 |
| 1986 | 11.0 |
| 1987 | 11.2 |
| 1988 | 11.2 |
| 1989 | 11.2 |
| 1990 | 12.7 |
| 1991 | 12.7 |
| 1992 | 13.8 |
| 1993 | 13.8 |
| 1994 | 13.8 |
| 1995 | 14.6 |
| 1996 | 14.6 |
| 1997 | 15.1 |
| 1998 | 16.3 |
| 1999 | 16.3 |

(3) *Checker Motors Corporation.*

TABLE 7 TO § 531.5(e)(3)—AVERAGE FUEL ECONOMY STANDARDS

| Model year | Miles per gallon |
|---|---|
| 1978 | 17.6 |
| 1979 | 16.5 |
| 1980 | 18.5 |
| 1981 | 18.3 |
| 1982 | 18.4 |

(4) *Aston Martin Lagonda Limited.*

TABLE 8 TO § 531.5(e)(4)—AVERAGE FUEL ECONOMY STANDARD

| Model year | (Miles per gallon) |
|---|---|
| 1979 | 11.5 |
| 1980 | 12.1 |
| 1981 | 12.2 |
| 1982 | 12.2 |
| 1983 | 11.3 |
| 1984 | 11.3 |
| 1985 | 11.4 |
| 2008 | 19.0 |
| 2009 | 18.6 |
| 2010 | 19.2 |
| 2011 | 19.1 |
| 2012 | 19.2 |
| 2013 | 20.1 |
| 2014 | 19.7 |
| 2015 | 19.8 |
| 2016 | 20.2 |
| 2017 | 21.4 |
| 2018 | 22.9 |
| 2019 | 22.4 |
| 2020 | 22.6 |
| 2021 | 24.9 |
| 2022 | 24.9 |
| 2023 | 24.9 |

(5) *Excalibur Automobile Corporation.*

TABLE 9 TO § 531.5(e)(5)—AVERAGE FUEL ECONOMY STANDARDS

| Model year | Miles per gallon |
|---|---|
| 1978 | 11.5 |
| 1979 | 11.5 |
| 1980 | 16.2 |
| 1981 | 17.9 |
| 1982 | 17.9 |
| 1983 | 16.6 |
| 1984 | 16.6 |
| 1985 | 16.6 |

(6) *Lotus Cars Ltd.*

TABLE 10 TO § 531.5(e)(6)—AVERAGE FUEL ECONOMY STANDARDS

| Model year | Miles per gallon |
|---|---|
| 1994 | 24.2 |
| 1995 | 23.3 |

(7) *Officine Alfieri Maserati, S.p.A.*

TABLE 11 TO § 531.5(e)(7)—AVERAGE FUEL ECONOMY STANDARD

| Model year | Miles per gallon |
|---|---|
| 1978 | 12.5 |
| 1979 | 12.5 |
| 1980 | 9.5 |
| 1984 | 17.9 |
| 1985 | 16.8 |

(8) *Lamborghini of North America.*

TABLE 12 TO § 531.5(e)(8)—AVERAGE FUEL ECONOMY STANDARD

| Model year | Miles per gallon |
|---|---|
| 1983 | 13.7 |
| 1984 | 13.7 |

(9) *LondonCoach Co., Inc.*

TABLE 13 TO § 531.5(e)(9)—AVERAGE FUEL ECONOMY STANDARD

| Model year | Miles per gallon |
|---|---|
| 1985 | 21.0 |
| 1986 | 21.0 |
| 1987 | 21.0 |

(10) *Automobili Lamborghini S.p.A./Vector Aeromotive Corporation.*

TABLE 14 § 531.5(e)(10)—AVERAGE FUEL ECONOMY STANDARD

| Model year | Miles per gallon |
|---|---|
| 1995 | 12.8 |
| 1996 | 12.6 |
| 1997 | 12.5 |

(11) *Dutcher Motors, Inc.*

TABLE 15 TO § 531.5(e)(11)—AVERAGE FUEL ECONOMY STANDARD

| Model year | Miles per gallon |
|---|---|
| 1986 | 16.0 |
| 1987 | 16.0 |
| 1988 | 16.0 |
| 1992 | 17.0 |
| 1993 | 17.0 |
| 1994 | 17.0 |
| 1995 | 17.0 |

(12) *MedNet, Inc.*

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TABLE 16 TO § 531.5(e)(12)—AVERAGE FUEL ECONOMY STANDARD

| Model year | Average fuel economy standard (miles per gallon) |
|---|---|
| 1996 | 17.0 |
| 1997 | 17.0 |
| 1998 | 17.0 |

(13) *Vector Aeromotive Corporation.*

TABLE 17 TO § 531.5(e)(13)—AVERAGE FUEL ECONOMY STANDARD

| Model year | Miles per gallon |
|---|---|
| 1998 | 12.1 |

(14) *Qvale Automotive Group Srl.*

TABLE 18 TO § 531.5(e)(14)—AVERAGE FUEL ECONOMY STANDARD

| Model year | Miles per gallon |
|---|---|
| 2000 | 22.0 |
| 2001 | 22.0 |

(15) *Spyker Automobielen B.V.*

TABLE 19 TO § 531.5(e)(15)—AVERAGE FUEL ECONOMY STANDARD

| Model year | (Miles per gallon) |
|---|---|
| 2006 | 18.9 |
| 2007 | 18.9 |
| 2008 | 19.6 |
| 2009 | 19.6 |
| 2010 | 20.7 |

(16) *Ferrari.*

TABLE 20 TO § 531.5(e)(16)—AVERAGE FUEL ECONOMY STANDARD

| Model year | (Miles per gallon) |
|---|---|
| 2016 | 21.7 |
| 2017 | 21.5 |
| 2018 | 21.6 |
| 2020 | 21.1 |

(17) *Koenigsegg.*

TABLE 21 TO § 531.5(e)(17)—AVERAGE FUEL ECONOMY STANDARD

| Model year | (Miles per gallon) |
|---|---|
| 2015 | 16.7 |
| 2018 | 16.7 |

TABLE 21 TO § 531.5(e)(17)—AVERAGE FUEL ECONOMY STANDARD—Continued

| Model year | (Miles per gallon) |
|---|---|
| 2019 | 16.6 |
| 2020 | 16.6 |
| 2021 | 16.6 |
| 2022 | 16.9 |
| 2023 | 16.9 |

(18) *McLaren.*

TABLE 22 TO § 531.5(e)(18)—AVERAGE FUEL ECONOMY STANDARD

| Model year | (Miles per gallon) |
|---|---|
| 2012 | 23.2 |
| 2013 | 24.0 |
| 2014 | 23.8 |
| 2015 | 22.9 |
| 2016 | 23.2 |
| 2017 | 24.3 |
| 2018 | 23.3 |
| 2019 | 22.5 |
| 2020 | 22.5 |
| 2021 | 21.5 |
| 2022 | 24.6 |
| 2023 | 25.7 |

(19) *Mobility Ventures.*

TABLE 23 TO § 531.5(e)(19)—AVERAGE FUEL ECONOMY STANDARD

| Model year | (Miles per gallon) |
|---|---|
| 2014 | 19.6 |
| 2015 | 20.1 |
| 2016 | 20.1 |

(20) *Pagani.*

TABLE 24 TO § 531.5(e)(20)—AVERAGE FUEL ECONOMY STANDARD

| Model year | (Miles per gallon) |
|---|---|
| 2014 | 15.6 |
| 2016 | 15.6 |
| 2017 | 15.6 |
| 2018 | 15.6 |
| 2019 | 15.5 |
| 2020 | 15.5 |
| 2021 | 15.5 |
| 2022 | 15.5 |
| 2023 | 15.5 |

[87 FR 26070, May 2, 2022, as amended at 89 FR 12756, Feb. 20, 2024; 89 FR 52945, June 24, 2024; 89 FR 60833, July 29, 2024]

### § 531.6 Measurement and calculation procedures.

(a) The fleet average fuel economy performance of all passenger automobiles that are manufactured by a manufacturer in a model year shall be determined in accordance with procedures established by the Administrator of the Environmental Protection Agency (EPA) under 49 U.S.C. 32904 and set forth in 40 CFR part 600.

(b) For model years 2017 through 2031, a manufacturer is eligible to increase the fuel economy performance of passenger cars in accordance with procedures established by the Environmental Protection Agency (EPA) set forth in 40 CFR part 600, subpart F, including adjustments to fuel economy for fuel consumption improvements related to air conditioning (AC) efficiency and off-cycle technologies. Starting in model year 2027, fuel economy increases for fuel consumption improvement values under 40 CFR 86.1868–12 and 40 CFR 86.1869–12 only apply for vehicles propelled by internal combustion engines. Manufacturers must provide reporting on these technologies as specified in § 537.7 of this chapter by the required deadlines.

(1) *Efficient AC technologies.* A manufacturer may increase its fleet average fuel economy performance through the use of technologies that improve the efficiency of AC systems pursuant to the requirements in 40 CFR 86.1868–12. Fuel consumption improvement values resulting from the use of those AC systems must be determined in accordance with 40 CFR 600.510–12(c)(3)(i).

(2) *Off-cycle technologies on EPA's predefined list.* A manufacturer may increase its fleet average fuel economy performance through the use of off-cycle technologies pursuant to the requirements in 40 CFR 86.1869–12 for predefined off-cycle technologies in accordance with 40 CFR 86.1869–12(b). The fuel consumption improvement is determined in accordance with 40 CFR 600.510–12(c)(3)(ii).

(3) *Off-cycle technologies using 5-cycle testing.* Through model year 2026, a manufacturer may increase its fleet average fuel economy performance through the use of off-cycle technologies tested using the EPA's 5-cycle methodology in accordance with 40 CFR 86.1869–12(c). The fuel consumption improvement is determined in accordance with 40 CFR 600.510–12(c)(3)(ii).

(4) *Off-cycle technologies using the alternative EPA-approved methodology.* Through model year 2026, a manufacturer may seek to increase its fuel economy performance through use of an off-cycle technology requiring an application request made to the EPA in accordance with 40 CFR 86.1869–12(d).

(i) *Eligibility under the Corporate Average Fuel Economy (CAFE) program requires compliance with paragraphs (b)(4)(i)(A) through (C) of this section.* Paragraphs (b)(4)(i)(A), (B) and (D) of this section apply starting in model year 2024. Paragraph (b)(4)(i)(E) of this section applies starting in model year 2025.

(A) A manufacturer seeking to increase its fuel economy performance using the alternative methodology for an off-cycle technology, should submit a detailed analytical plan to EPA prior to the applicable model year. The detailed analytical plan may include information, such as planned test procedure and model types for demonstration. The plan will be approved or denied in accordance with 40 CFR 86.1869.12(d).

(B) A manufacturer seeking to increase its CAFE program fuel economy performance using the alternative methodology for an off-cycle technology must submit an official credit application to EPA and obtain approval in accordance with 40 CFR 86.1869.12(e) prior to September of the given model year.

(C) A manufacturer's plans, applications and requests approved by the EPA must be made in consultation with NHTSA. To expedite NHTSA's consultation with the EPA, a manufacturer must concurrently submit its application to NHTSA if the manufacturer is seeking off-cycle fuel economy improvement values under the CAFE program for those technologies. For off-cycle technologies that are covered under 40 CFR 86.1869–12(d), NHTSA will consult with the EPA regarding NHTSA's evaluation of the specific off-cycle technology to ensure its impact on fuel economy and the suitability of

using the off-cycle technology to adjust the fuel economy performance.

(D) A manufacturer may request an extension from NHTSA for more time to obtain an EPA approval. Manufacturers should submit their requests 30 days before the deadlines in paragraphs (b)(4)(i)(A) through (C) of this section. Requests should be submitted to NHTSA's Director of the Office of Vehicle Safety Compliance at *cafe@dot.gov*.

(E) For MYs 2025 and 2026, a manufacturer must respond within 60-days to any requests from EPA or NHTSA for additional information or clarifications to submissions provided pursuant to paragraphs (b)(4)(i)(A) and (B) of this section. Failure to respond within 60 days may result in denial of the manufacturer's request to increase its fuel economy performance through use of an off-cycle technology requests made to the EPA in accordance with 40 CFR 86.1869–12(d).

(ii) *Review and approval process.* NHTSA will provide its views on the suitability of the technology for that purpose to the EPA. NHTSA's evaluation and review will consider:

(A) Whether the technology has a direct impact upon improving fuel economy performance;

(B) Whether the technology is related to crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes;

(C) Information from any assessments conducted by the EPA related to the application, the technology and/or related technologies; and

(D) Any other relevant factors.

(iii) *Safety.* (A) Technologies found to be defective or non-compliant, subject to recall pursuant to part 573 of this chapter, Defect and Noncompliance Responsibility and Reports, due to a risk to motor vehicle safety, will have the values of approved off-cycle credits removed from the manufacturer's credit balance or adjusted to the population of vehicles the manufacturer remedies as required by 49 U.S.C. chapter 301. NHTSA will consult with the manufacturer to determine the amount of the adjustment.

(B) Approval granted for innovative and off-cycle technology credits under NHTSA's fuel efficiency program does not affect or relieve the obligation to comply with the Vehicle Safety Act (49 U.S.C. chapter 301), including the "make inoperative" prohibition (49 U.S.C. 30122), and all applicable Federal motor vehicle safety standards (FMVSSs) issued thereunder (part 571 of this chapter). In order to generate off-cycle or innovative technology credits manufacturers must state—

(*1*) That each vehicle equipped with the technology for which they are seeking credits will comply with all applicable FMVSS(s); and

(*2*) Whether or not the technology has a fail-safe provision. If no fail-safe provision exists, the manufacturer must explain why not and whether a failure of the innovative technology would affect the safety of the vehicle.

[87 FR 26070, May 2, 2022, as amended at 89 FR 52948, June 24, 2024]

APPENDIX A TO PART 531—EXAMPLE OF CALCULATING COMPLIANCE UNDER § 531.5(C)

Assume a hypothetical manufacturer (Manufacturer X) produces a fleet of domestic passenger automobiles in MY 2012 as follows:

APPENDIX A—TABLE I

| Model type | | | | Description | Actual measured fuel economy (mpg) | Volume |
|---|---|---|---|---|---|---|
| Group | Carline name | Basic engine (L) | Transmission class | | | |
| 1 | PC A FWD | 1.8 | A5 | 2-door sedan | 34.0 | 1,500 |
| 2 | PC A FWD | 1.8 | M6 | 2-door sedan | 34.6 | 2,000 |
| 3 | PC A FWD | 2.5 | A6 | 4-door wagon | 33.8 | 2,000 |
| 4 | PC A AWD | 1.8 | A6 | 4-door wagon | 34.4 | 1,000 |
| 5 | PC A AWD | 2.5 | M6 | 2-door hatchback | 32.9 | 3,000 |
| 6 | PC B RWD | 2.5 | A6 | 4-door wagon | 32.2 | 8,000 |
| 7 | PC B RWD | 2.5 | A7 | 4-door sedan | 33.1 | 2,000 |
| 8 | PC C AWD | 3.2 | A7 | 4-door sedan | 30.6 | 5,000 |
| 9 | PC C FWD | 3.2 | M6 | 2-door coupe | 28.5 | 3,000 |
| Total | | | | | | 27,500 |

**Note to Table I to this appendix:** Manufacturer X's required fleet average fuel economy standard level would first be calculated by determining the fuel economy targets applicable to each unique model type and footprint combination for model type groups 1–9 as illustrated in Table II to this appendix. Manufacturer X calculates a fuel economy target standard for each unique model type and footprint combination.

APPENDIX A—TABLE II

| Model type | | | | Description | Base tire size | Wheel-base (inches) | Track width F&R average (inches) | Footprint (ft²) | Volume | Fuel economy target standard (mpg) |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | Carline name | Basic engine (L) | Transmission class | | | | | | | |
| 1 | PC A FWD | 1.8 | A5 | 2-door sedan | 205/75R14 | 99.8 | 61.2 | 42.4 | 1,500 | 35.01 |
| 2 | PC A FWD | 1.8 | M6 | 2-door sedan | 215/70R15 | 99.8 | 60.9 | 42.2 | 2,000 | 35.14 |
| 3 | PC A FWD | 2.5 | A6 | 4-door wagon | 215/70R15 | 100.0 | 60.9 | 42.3 | 2,000 | 35.08 |
| 4 | PC A AWD | 1.8 | A6 | 4-door wagon | 235/60R15 | 100.0 | 61.2 | 42.5 | 1,000 | 35.95 |
| 5 | PC A AWD | 2.5 | M6 | 2-door hatchback | 225/65R16 | 99.6 | 59.5 | 41.2 | 3,000 | 35.81 |
| 6 | PC B RWD | 2.5 | A6 | 4-door wagon | 265/55R18 | 109.2 | 66.8 | 50.7 | 8,000 | 30.33 |
| 7 | PC B RWD | 2.5 | A7 | 4-door sedan | 235/65R17 | 109.2 | 67.8 | 51.4 | 2,000 | 29.99 |
| 8 | PC C AWD | 3.2 | A7 | 4-door sedan | 265/55R18 | 111.3 | 67.8 | 52.4 | 5,000 | 29.52 |
| 9 | PC C FWD | 3.2 | M6 | 2-door coupe | 225/65R16 | 111.3 | 67.2 | 51.9 | 3,000 | 29.76 |
| Total | | | | | | | | | 27,500 | |

**Note to Table II to this appendix:** With the appropriate fuel economy targets determined for each unique model type and footprint combination, Manufacturer X's required fleet average fuel economy standard would be calculated as illustrated in Figure 1 to this appendix.

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**Appendix A Figure 1—Calculation of Manufacturer X's fleet average fuel**

**economy standard using Table II**

*Fleet Average Fuel Economy Standard*

$$= \frac{(Manufacturer's\ Domestic\ Passenger\ Automobile\ Production\ for\ Applicable\ Model\ Year)}{\Sigma_i(\frac{Group_1\ Production}{Group_1 Target\ Standard} + \frac{Group_2\ Production}{Group_{12a} Target\ Standard} + \dots \frac{Group_9\ Production}{Group_9 Target\ Standard})}$$

*Fleet Average Fuel Economy Standard*

$$= \frac{(27,500)}{(\frac{1500}{35.01} + + \frac{2000}{35.14} + \frac{2000}{35.08} + \frac{1000}{35.95} + \frac{3000}{35.81} + + \frac{8000}{30.33} + \frac{2000}{29.99} + \frac{5000}{29.52} + \frac{3000}{29.79})}$$

$$= \ 31.6 mpg$$

**Appendix A Figure 2—Calculation of Manufacturer X's actual fleet average fuel economy**

**performance level using Table I**

*Fleet Average Fuel Economy Performance*

$$= \frac{(Manufacturer's\ Domestic\ Passenger\ Automobile\ Production\ for\ Applicable\ Model\ Year)}{\Sigma_i(\frac{Group_1\ Production}{Group_1 Performance} + \frac{Group_2\ Production}{Group_2 Performance} + \dots \frac{Group_9\ Production}{Group_9 Performance})}$$

*Fleet Average Fuel Economy Performance*

$$= \frac{(27,500)}{(\frac{1500}{34.0} + \frac{2000}{34.6} + \frac{2000}{33.8} + \frac{1000}{34.4} + \frac{3000}{32.9} + \frac{8000}{32.2} + \frac{2000}{33.1} + \frac{5000}{30.6} + \frac{3000}{28.5})} = \ 32.0\ mpg$$

NOTE TO FIGURE 2 TO THIS APPENDIX: Since the actual fleet average fuel economy performance of Manufacturer X's fleet is 32.0 mpg, as compared to its required fleet fuel economy standard of 31.6 mpg, Manufacturer X complied with the CAFE standard for MY 2012 as set forth in §531.5(c).

## PART 533—LIGHT TRUCK FUEL ECONOMY STANDARDS

Sec.
533.1  Scope.
533.2  Purpose.
533.3  Applicability.
533.4  Definitions.
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533.6  Measurement and calculation procedures.

APPENDIX A TO PART 533—EXAMPLE OF CALCULATING COMPLIANCE UNDER §533.5(I)

### §533.1  Scope.

This part establishes average fuel economy standards pursuant to 49 U.S.C. 32902 for light trucks.