§ 600.510–93  

(2) A sum of terms, each of which corresponds to a model type within that category of automobiles and is a fraction determined by dividing

(i) The number of automobiles of that model type produced by the manufacturer in the model year by

(ii) The fuel economy calculated for that model type in accordance with paragraph (b)(2) of this section.

(d) The Administrator may approve alternative calculation methods if they are part of an approved credit plan under the provisions of section 509(b) of U.S.C. 2008(b).

(e) For passenger categories identified in paragraphs (a)(1) and (2) of this section, the average fuel economy calculated in accordance with paragraph (c) of this section shall be adjusted using the following equation:

\[
AFE_{adj} = AFE\left(\frac{c}{(0.55 a c + 0.45)} + (0.5556 a + 0.4487) c + (0.45 a + 0.45)\right) + IW
\]

Where:

\[AFE\] = Adjusted average combined fuel economy, rounded to the nearest 0.1 mpg.

\[AFE\] = Average combined fuel economy as calculated in paragraph (c) of this section, rounded to the nearest 0.0001 mpg.

\[c\] = Sales-weighted average (rounded to the nearest 0.0001 mpg) of all model type highway fuel economy values (rounded to the nearest 0.1 mpg) divided by the sales-weighted average (rounded to the nearest 0.0001 mpg) of all model type city fuel economy values (rounded to the nearest 0.1 mpg). The quotient shall be rounded to 4 decimal places. These average fuel economies shall be determined using the methodology of paragraph (c) of this section.

\(c = 0.0022\) for the 1986 model year.

(5) The test procedure change is required by EPA or is a change initiated by EPA in its laboratory and is not a change implemented solely by a manufacturer in its own laboratory.

§ 600.510–93 Calculation of average fuel economy.

(a) Average fuel economy will be calculated to the nearest 0.1 mpg for the
classes of automobiles identified in this section, and the results of such calculations will be reported to the Secretary of Transportation for use in determining compliance with applicable fuel economy standards.

(1) An average fuel economy calculation will be made for the category of passenger automobiles that is domestically manufactured as defined in § 600.511(d)(1).

(2) An average fuel economy calculation will be made for the category of passenger automobiles that is not domestically manufactured as defined in § 600.511(d)(2).

(3) An average fuel economy calculation will be made for the category of light trucks that is domestically manufactured as defined in § 600.511(e)(1).

(4) An average fuel economy calculation will be made for the category of light trucks that is not domestically manufactured as defined in § 600.511(e)(2).

(b) For the purpose of calculating average fuel economy under paragraph (c) of this section:

(1) All fuel economy data submitted in accordance with § 600.006(e) or § 600.502(c) shall be used.

(2) The combined city/highway fuel economy will be calculated for each model type in accordance with § 600.207 of this section except that:

(i) Separate fuel economy values will be calculated for model types and base levels associated with car lines that are:

(A) Domestically produced; and

(B) Nondomestically produced and imported;

(ii) Total model year production data, as required by this subpart will be used instead of sales projections;

(iii) The fuel economy value of diesel-powered model types will be multiplied by the factor 1.0 to convert gallons of diesel fuel to equivalent gallons of gasoline.

(c) Except as permitted in paragraph (d) of this section, the average fuel economy will be calculated individually for each category identified in paragraph (a) of this section as follows:

(1) Divide the total production volume of that category of automobiles:

(2) A sum of terms, each of which corresponds to a model type within that category of automobiles and is a fraction determined by dividing:

(i) The number of automobiles of that model type produced by the manufacturer in the model year;

(ii) For gasoline-fueled and diesel-fueled model types, the fuel economy calculated for that model type in accordance with paragraph (b)(2) of this section; or

(iii) For alcohol-fueled model types, the fuel economy value calculated for that model type in accordance with paragraph (b)(2) of this section divided by 0.15 and rounded to the nearest 0.1 mpg; or

(iv) For natural gas-fueled model types, the fuel economy value calculated for that model type in accordance with paragraph (b)(2) of this section divided by 0.15 and rounded to the nearest 0.1 mpg; or

(v) For alcohol dual fuel model types, for model years 1993 through 2004, the harmonic average of the following two terms: the result rounded to the nearest 0.1 mpg;
(A) The combined model type fuel economy value for operation on gasoline or diesel fuel as determined in §600.207(b)(5)(i); and

(B) The combined model type fuel economy value for operation on alcohol fuel as determined in §600.207(b)(5)(ii) divided by 0.15 provided the requirements of §600.510 (g) are met; or

(vi) For natural gas dual fuel model types, for model years 1993 through 2004, the harmonic average of the following two terms; the result rounded to the nearest 0.1 mpg:

(A) The combined model type fuel economy value for operation on gasoline or diesel as determined in §600.207(b)(5)(i); and

(B) The combined model type fuel economy value for operation on natural gas as determined in §600.207(b)(5)(ii) divided by 0.15 provided the requirements of paragraph (g) of this section are met.

(d) The Administrator may approve alternative calculation methods if they are part of an approved credit plan under the provisions of 15 U.S.C. 2003.

(e) For passenger categories identified in paragraphs (a) (1) and (2) of this section, the average fuel economy calculated in accordance with paragraph (c) of this section shall be adjusted using the following equation:

\[ \text{AFE}_{\text{adj}} = \frac{\text{AFE}((0.55\times a + 0.45\times c) + (0.5556\times a + 0.4487) / ((0.55\times a) + 0.45)} + \text{IFW} }{\text{IW}} \]

Where:

- \( \text{AFE}_{\text{adj}} \) = Adjusted average combined fuel economy, rounded to the nearest 0.1 mpg.
- \( \text{AFE} \) = Average combined fuel economy as calculated in paragraph (c) of this section, rounded to the nearest 0.001 mpg.
- \( a \) = Sales-weight average (rounded to the nearest 0.001 mpg) of all model type highway fuel economy values (rounded to the nearest 0.1 mpg) divided by the sales-weighted average (rounded to the nearest 0.001 mpg) of all model type city fuel economy values (rounded to the nearest 0.1 mpg). The quotient shall be rounded to 4 decimal places. These average fuel economies shall be determined using the methodology of paragraph (c) of this section.
- \( c \) = A constant value, fixed by model year. For 1986, the Administrator will specify the \( c \) value after the necessary laboratory humidity and test fuel data become available.
- \( \text{IW} \) = Adjusted average combined fuel economy for operation on gasoline or diesel fuel as determined in §600.207(b)(5)(i).
- \( \text{SF}_{\text{ETWC}} \) = The 3000 lb. inertia weight class sales divided by total sales. The quotient shall be rounded to 4 decimal places.
- \( \text{SF}_{\text{ETWC}} \) = The 4000 lb. equivalent test weight for operation on gasoline or diesel fuel as determined in §600.207(b)(5)(ii).
- \( \text{AFE}_{\text{ETWC}} \) = The sales-weighted average combined fuel economy of all 3000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.
- \( \text{AFE}_{\text{ETWC}} \) = The sales-weighted average combined fuel economy of all 4000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

(f) The Administrator shall calculate and apply additional average fuel economy adjustments if, after notice and opportunity for comment, the Administrator determines that, as a result of test procedure changes not previously considered, such correction is necessary to yield fuel economy test results that are comparable to those obtained under the 1975 test procedures. In making such determinations, the Administrator must find that:

(1) A directional change in measured fuel economy of an average vehicle can be predicted from a revision to the test procedures;

(2) The magnitude of the change in measured fuel economy for any vehicle or fleet of vehicles caused by a revision to the test procedures is quantifiable from theoretical calculations or best available test data;

(3) The impact of a change on average fuel economy is not due to eliminating the ability of manufacturers to take advantage of flexibility within the existing test procedures to gain measured improvements in fuel economy which are not the result of actual improvements in the fuel economy of production vehicles;

(4) The impact of a change on average fuel economy is not solely due to a greater ability of manufacturers to reflect in average fuel economy those design changes expected to have comparable effects on in-use fuel economy;
(5) The test procedure change is required by EPA or is a change initiated by EPA in its laboratory and is not a change implemented solely by a manufacturer in its own laboratory.

(g)(1) Alcohol dual fuel automobiles and natural gas dual fuel automobiles must provide equal or greater energy efficiency while operating on alcohol or natural gas as while operating on gasoline or diesel fuel to obtain the CAFE credit determined in paragraphs (c)(2)(v) and (vi) of this section. The following equation must hold true:

\[ \frac{E_{\text{alt}}}{E_{\text{pet}}} > \frac{D_{\text{alt}}}{D_{\text{pet}}} \]

Where:

- \( E_{\text{alt}} \) is the fuel economy [miles/gallon for liquid fuels or miles/100 standard cubic feet for gaseous fuels] while operated on the alternative fuel as determined in \( \S 600.113 \);
- \( E_{\text{pet}} \) is the fuel economy [miles/gallon] while operated on petroleum fuel (gasoline or diesel) as determined in \( \S 600.113 \);
- \( D_{\text{alt}} \) is the density [lb/gallon for liquid fuels or lb/100 standard cubic feet for gaseous fuels] of the alternative fuel;
- \( D_{\text{pet}} \) is the density [lb/gallon] of the petroleum fuel.

(i) The equation must hold true for both the city and highway fuel economy values for each test of each test vehicle.

(ii)(A) The net heating value for alcohol fuels shall be determined per ASTM D 240 (Incorporated by reference as specified in \( \S 600.011–93 \)).

(B) The density for alcohol fuels shall be determined per ASTM D 1298 (Incorporated by reference as specified in \( \S 600.011–93 \)).

(iii) The net heating value and density of gasoline are to be determined by the manufacturer in accordance with \( \S 600.113(\text{c}) \).

(2) For model years 1993 through 1995, alcohol dual fuel automobiles designed to operate on mixtures of alcohol and gasoline must, in addition to paragraph (g)(1) of this section, to obtain the CAFE credit determined in paragraphs (c)(2)(v) and (vi) of this section, provide equal or superior energy efficiency while operating on a mixture of 50% alcohol, 50% gasoline by volume, as while operating on gasoline fuel. The following equation must hold true:

\[ \frac{E_{\text{alt}}}{E_{\text{pet}}} \geq \frac{D_{\text{alt}}}{D_{\text{pet}}} \]

Where:

- \( E_{\text{alt}} \) is the fuel economy [miles/gallon] while operated on 50% alcohol, 50% gasoline mixture compared to using 100% gasoline as determined in \( \S 600.113 \);
- \( E_{\text{pet}} \) is the fuel economy [miles/gallon] while operated on gasoline as determined in \( \S 600.113 \);
- \( NHV_{\text{alt}} \) is the net (lower) heating value [BTU/1lb] of the 50/50 blend;
- \( NHV_{\text{pet}} \) is the net (lower) heating value [BTU/1lb] of gasoline;
- \( D_{\text{alt}} \) is the density [lb/gallon] of the 50/50 blend;
- \( D_{\text{pet}} \) is the density [lb/gallon] of the gasoline.

(i) To demonstrate that the equation holds true for each engine family, the manufacturer will:

(A) Test one test vehicle in each engine family on both the city and highway cycles; or

(B) In lieu of testing, provide a written statement attesting that equal or superior energy efficiency is attained while using a 50% alcohol, 50% gasoline mixture compared to using 100% gasoline.

(ii)(A) The net heating value for the 50% alcohol, 50% gasoline mixture shall be determined by ASTM D 240 (Incorporated by reference as specified in \( \S 600.011–93 \)).

(B) The density for the 50% alcohol, 50% gasoline mixture shall be determined per ASTM D 1298 (Incorporated by reference as specified in \( \S 600.011–93 \)).

(iii) The net heating value and density of gasoline are to be determined by the manufacturer in accordance with \( \S 600.113(\text{c}) \).

(3) Alcohol dual fuel passenger automobiles and natural gas dual fuel passenger automobiles manufactured during model years 1993 through 2004 must
§ 600.511–80 Determination of domestic production.

(a) Except with advance approval of the Administrator, an automobile shall be considered domestically produced in any model year if it is included within a domestically produced car line (car line includes station wagons for purposes of this paragraph), unless the assembly of such automobile is completed in Canada or Mexico and such automobile is not imported into the United States prior to the expiration of 30 days following the end of the model year. For purposes of this paragraph a car line will be considered domestically produced if the following ratio is less than 0.25:

(1) The sum of the declared value, as defined in §600.502, of all of the imported components installed or included on automobiles produced within such a car line within a given model year plus the cost of transportation and insuring such components to the United States port of entry, the Mexican port of entry (when paragraph (b)(3) of this section applies), or the Canadian port of entry but exclusive of any customs duty, divided by

(2) The cost of production, as defined in §600.502, of automobiles within such car line.

(b) For the purposes of calculations under this subpart with respect to automobiles manufactured during any model year,

(1) An average exchange rate for the country of origin of each imported component shall be used that is calculated by taking the mean of the exchange rates in effect at the end of each quarter set by the Federal Reserve Bank of New York for twelve calendar quarters prior to and including the calendar quarter ending one year prior to the date that the manufacturer submits the calculation of the preliminary average for such model year. Such rate, once calculated, shall be in effect for the duration of the model year. Upon petition of a manufacturer, the Administrator may permit the use of a different exchange rate where appropriate and necessary.

(2) For automobiles for which paragraph (b)(3) of this section does not apply pursuant to the schedule in paragraph (b)(4), components shall be considered imported unless they are either:

(i) Wholly the growth, product, or manufacture of the United States and/or Canada, or

(ii) Substantially transformed in the United States or Canada into a new and different article of commerce.

[59 FR 38659, Aug. 3, 1994]