IN THE UNITED STATES COURT OF APPEALS
FOR THE FIFTH CIRCUIT

TEXAS CORN PRODUCERS; TEXAS SORGHUM PRODUCERS; NATIONAL SORGHUM PRODUCERS, *Petitioners*, v. MICHAEL S. REGAN, *in his official capacity as the Administrator of the United States Environmental Protection Agency*; and UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *Respondents*.	No. 24-_____

PETITION FOR REVIEW

Pursuant to 49 U.S.C. § 32909(a) and Federal Rule of Appellate Procedure 15(a), the Texas Corn Producers, the Texas Sorghum Producers, and the National Sorghum Producers (collectively, "Petitioners") hereby petition this Court for review of the final agency action of the Administrator of the United States Environmental Protection Agency ("EPA") in promulgating final fuel economy test

procedure regulations, to be codified in 40 C.F.R. Part 600, within a rulemaking entitled "Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles," and published in the Federal Register at 89 Fed. Reg. 27,842 (Apr. 18, 2024). Petitioners challenge only the portions of the rule promulgated under the Motor Vehicle Information and Cost Savings Act, 49 U.S.C. Chapter 329. Petitioners do not challenge any part of the rule promulgated by EPA under the Clean Air Act, 42 U.S.C. Chapter 85. The relevant part of the final rule is attached as Exhibit A.

Jurisdiction and venue are proper under 49 U.S.C. § 32909(a), because Petitioners are persons adversely affected by a regulation prescribed under 49 U.S.C. § 32904 and because Petitioners reside in this Circuit. The Petition is timely filed because the challenged fuel economy test procedure regulation was "prescribed" by EPA on April 18, 2024, when it was published in the Federal Register. *See Nat. Res. Def. Council v. Nat'l Highway Traffic Safety Admin.*, 894 F.3d 95, 103, 106 (2d Cir. 2018).

Petitioners seek review of the final fuel economy test procedure regulation on the following grounds:

(1) EPA's establishment of an inaccurate R_a "sensitivity factor" of "0.81" violates EPA's statutory duty to promulgate test procedures "that give comparable results" to prior test procedure regulations and unlawfully increases the stringency of automobile fuel economy standards. 49 U.S.C. § 32904(c).

(2) EPA's final R_a "sensitivity factor" is arbitrary and capricious or otherwise contrary to law.

Petitioners respectfully request that this Court (1) grant the Petition and hold that the R_a "sensitivity factor" to be codified at 40 C.F.R. Part 600, is unlawful; (2) vacate, enjoin, and set the regulation aside; and (3) provide such other relief as this Court deems appropriate.

Dated: April 26, 2024

Respectfully submitted,

/s/ James R. Conde
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CERTIFICATE OF SERVICE

I hereby certify that that on April 26, 2024, I will cause a true and correct copy of the Petition for Review and Exhibit A attached thereto, to be served via first-class certified mail, return receipt requested, to:

U.S. Environmental Protection Agency
Correspondence Control Unit
Office of General Counsel (2311)
1200 Pennsylvania Ave., NW
Washington, DC 20460

Dated: April 26, 2024

Respectfully submitted,

/s/ James R. Conde

Counsel for Petitioners

Exhibit A

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 85, 86, 600, 1036, 1037, 1066, and 1068

[EPA–HQ–OAR–2022–0829; FRL–8953–04–OAR]

RIN 2060–AV49

Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Under the Clean Air Act, the Environmental Protection Agency (EPA) is establishing new, more protective emissions standards for criteria pollutants and greenhouse gases (GHG) for light-duty vehicles and Class 2b and 3 (''medium-duty'') vehicles that will phase-in over model years 2027 through 2032. In addition, EPA is finalizing GHG program revisions in several areas, including off-cycle and air conditioning credits, the treatment of upstream emissions associated with zero-emission vehicles and plug-in hybrid electric vehicles in compliance calculations, medium-duty vehicle incentive multipliers, and vehicle certification and compliance. EPA is also establishing new standards to control refueling emissions from incomplete medium-duty vehicles, and battery durability and warranty requirements for light-duty and medium-duty electric and plug-in hybrid electric vehicles. EPA is also finalizing minor amendments to update program requirements related to aftermarket fuel conversions, importing vehicles and engines, evaporative emission test procedures, and test fuel specifications for measuring fuel economy.

DATES: This final rule is effective on June 17, 2024. The incorporation by reference of certain publications listed in this regulation is approved by the Director of the Federal Register beginning June 17, 2024. The incorporation by reference of certain publications listed in this regulation is approved by the Director of the Federal Register as of March 27, 2023.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2022–0829. All documents in the docket are listed on the *https://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *https://www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT: Michael Safoutin, Office of Transportation and Air Quality, Assessment and Standards Division (ASD), Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor, MI 48105; telephone number: (734) 214–4348; email address: *safoutin.mike@epa.gov*.

SUPPLEMENTARY INFORMATION:

A. Does this action apply to me?

Entities potentially affected by this rule include light-duty vehicle manufacturers, independent commercial importers, alternative fuel converters, and manufacturers and converters of medium-duty vehicles (*i.e.,* vehicles between 8,501 and 14,000 pounds gross vehicle weight rating (GVWR)). Potentially affected categories and entities include:

Category	NAICS codes [a]	Examples of potentially affected entities
Industry	336111 336112	Motor Vehicle Manufacturers.
Industry	811111 811112 811198 423110	Commercial Importers of Vehicles and Vehicle Components.
Industry	335312 811198	Alternative Fuel Vehicle Converters.
Industry	333618 336120 336211 336312	On-highway medium-duty engine & vehicle (8,501–14,000 pounds GVWR) manufacturers.

[a] North American Industry Classification System (NAICS).

This list is not intended to be exhaustive, but rather provides a guide regarding entities likely to be affected by this action. To determine whether particular activities may be regulated by this action, you should carefully examine the regulations. You may direct questions regarding the applicability of this action to the person listed in **FOR FURTHER INFORMATION CONTACT.**

B. Did EPA conduct a peer review before issuing this action?

This regulatory action was supported by influential scientific information. EPA therefore conducted peer review in accordance with OMB's Final Information Quality Bulletin for Peer Review. Specifically, we conducted peer review on six analyses: (1) Optimization Model for reducing Emissions of Greenhouse gases from Automobiles (OMEGA 2.0), (2) Advanced Light-duty Powertrain and Hybrid Analysis (ALPHA3), (3) Motor Vehicle Emission Simulator (MOVES), (4) The Effects of New-Vehicle Price Changes on New- and Used-Vehicle Markets and Scrappage; (5) Literature Review on U.S. Consumer Acceptance of New Personally Owned Light-Duty Plug-in Electric Vehicles; (6) Cost and Technology Evaluation, Conventional Powertrain Vehicle Compared to an Electrified Powertrain Vehicle, Same Vehicle Class and OEM. All peer reviews were in the form of letter reviews conducted by a contractor. The peer review reports for each analysis are in the docket for this action and at EPA's Science Inventory (*https://cfpub.epa.gov/si/*).

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zero-emission vehicles with less complexity and with fewer certification requirements. The commenters did not, however, provide details on how such a concept could be constructed including the many implementation provisions that would need to be developed. EPA appreciates the spirit of these suggestions and the interest of certain stakeholders in exploring such alternative compliance pathways that might incentivize manufacturers to reduce emissions even sooner than required under our final program and considering the relationship to state programs. However, at this time, we believe that such concepts would need additional exploration and assessment. Although we are not finalizing such an alternate pathway in this rulemaking, EPA is open to continued dialog with all stakeholders on how such concepts might be structured for a potential future action.

d. Useful Life Standards and Test Procedures

The current program includes additional provisions that we did not reopen and so will continue to be implemented during the timeframe of this rule. We describe them briefly here for informational purposes.

Consistent with the requirement of CAA section 202(a)(1) that standards be applicable to vehicles ''for their useful life,'' the MY 2027–2032 vehicle standards will apply for the useful life of the vehicle.[558]

The existing program also requires certain test procedures over which emissions are measured and weighted to determine compliance with the GHG standards. These procedures are the Federal Test Procedure (FTP or ''city'' test) and the Highway Fuel Economy Test (HFET or ''highway'' test). EPA is making only minor changes to the GHG test procedures in this rulemaking. Namely, EPA will require manufacturers to use the same Tier 3 test fuel already specified for demonstrating compliance with criteria pollutant standards, as described in the next section. We are also revising the fleet utility factor for plug-in hybrid electric vehicles as described in section III.B.8 of the preamble and referencing an updated version of SAE J1711 to reflect the latest developments in measurement procedures for all types of hybrid electric vehicles as described in section IX.I of the preamble.

[558] The GHG emission standards apply for a useful life of 10 years or 120,000 miles for LDVs and LLDTs and 11 years or 120,000 miles for HLDTs and MDPVs. See 40 CFR 86.1805–17.

e. What test fuel is EPA finalizing?

Within the structure of the footprint-based GHG standards, EPA is also finalizing that gasoline powered vehicle compliance with the standards be demonstrated on Tier 3 test fuel. The previous GHG standards for light-duty gasoline vehicles are set on the required use of Indolene, or Tier 2 test fuel. Tier 3 test fuel more closely represents the typical market fuel available to consumers in that it contains 10 percent ethanol. EPA had previously proposed an adjustment factor to allow demonstration of compliance with the existing GHG standards using Tier 3 test fuel but did not adopt those changes (85 FR 28564, May 13, 2020). This rule does not require an adjustment factor for tailpipe GHG emissions, but rather requires manufacturers to test on Tier 3 test fuel and use the resultant tailpipe emissions directly in their compliance calculation. Such an adjustment factor is not required because the technology penetrations, feasibility, and cost estimates in this rule are based on compliance using Tier 3 test fuel.

Both the Tier 3 and these Tier 4 criteria pollutant standards were based on vehicle performance with Tier 3 test fuel; as a result, manufacturers currently use two different test fuels to demonstrate compliance with GHG and criteria pollutant standards. Setting new GHG standards based on Tier 3 test fuel is intended to address concerns regarding test burden related to using two different test fuels and using a test fuel which is dissimilar to market fuels. Accordingly, we expect this change to streamline manufacturer testing and reduce the costs of demonstrating compliance with the final rule.

The difference in GHG emissions between the two fuels is small but significant. EPA estimates that testing on Tier 3 test fuel will result in about 1.66 percent lower CO_2 emissions.[559] Because this difference in GHG emissions between the two fuels is significant in the context of measuring compliance with previous GHG standards, but small relative to the change in stringency of the finalized GHG standards in this rule, and because the cost of compliance on Tier 3 test fuel is reflected in this analysis for this rule, EPA believes that this rulemaking and the associated new GHG standards create an opportune time to shift compliance to Tier 3 fuel.

EPA is applying the change from Indolene to Tier 3 test fuel for demonstrating compliance with GHG standards starting in model year 2027. This is the same year as the new standards in this final rule begin, and we expect this model year alignment will facilitate a smooth transition for manufacturers. We accordingly allow manufacturers to continue to rely on the interim provisions adopted in 40 CFR 600.117 through model year 2026. These interim provisions address various testing concerns related to the arrangement for using different test fuels for different purposes. At the same time, we recognize that transitioning to a new test fuel is a change from how things have worked in the past, so we are providing additional flexibilities during the early years of the transition. Namely, manufacturers may optionally carry-over Indolene-based test results for model years 2027 through 2029.

For manufacturers that rely on Indolene-based test results in model years 2027 through 2029, we require a downward adjustment by 1.66 percent to GHG emission test results (*i.e.,* Tier 3 value = Tier 2 value ÷ 1.0166)) as a correction to correlate with test results that will be expected when testing with Tier 3 test fuel.

We separately proposed to apply an analogous correction for the opposite arrangement—testing with Tier 3 test fuel to demonstrate compliance with a GHG standard referenced to Indolene test fuel (85 FR 28564, May 13, 2020). We did not separately finalize the provisions in that proposed rule, and there is no longer a need to consider that provision now that vehicles are to be tested with the Tier 3 test fuel to demonstrate compliance with GHG standards.

Similar considerations apply for measuring fuel economy, both to meet Corporate Average Fuel Economy (CAFE) requirements and to determine values for fuel economy labeling. In this case, EPA is applying the calculation adjustments described in the 2020 proposal. This is necessary because fuel economy standards are set through a different regulatory process that has not been updated to accommodate the change to Tier 3 test fuel. These adjustments include: (1) New test methods for specific gravity and carbon mass (or weight) fraction of Tier 3 test fuel to calculate emissions in a way that accounts for ethanol blending while also remaining consistent with the calculations used to establish the CAFE standards, (2) a revised equation for calculating fuel economy that uses an ''R-factor'' of 0.81 to account for the difference in engine performance between Tier 3 and Tier 2 test fuels, and (3) amended instructions for calculating fuel economy label values based on 5-cycle values and derived 5-cycle values.

[559] EPA–420–R–18–004, ''Tier 3 Certification Fuel Impacts Test Program,'' January 2018.

Our overall goal is for manufacturers to transition to fuel economy testing with Tier 3 test fuel on the same schedule as described for demonstrating compliance with GHG standards in the preceding paragraphs.

To reiterate, for the GHG compliance program, we are evaluating GHG compliance with standards that are set using Tier 3 fuel starting in MY 2027; therefore, any vehicles that continue to be tested on Indolene, will need to have the results adjusted to be consistent with results on Tier 3 fuel. For the CAFE standards, we are continuing to evaluate fuel economy compliance with standards that are established on Indolene; therefore, any vehicles that are tested on Tier 3 fuel will need to have the results adjusted to be consistent with results on Indolene. Similar to the CAFE fuel economy standards, we are keeping the fuel economy label consistent with the current program; therefore, any vehicles that are tested on Tier 3 fuel will need to have the results adjusted to be consistent with results on Indolene.

EPA is adopting the following (Table 23) to address fuel-related testing and certification requirements through the transition to the new standards. As noted above, for both GHG and fuel economy standards, vehicle manufacturers may choose to test their vehicles with either Indolene or Tier 3 test fuel through MY 2026. Manufacturers must certify all vehicles to GHG standards using Tier 3 test fuel starting in MY 2027; however, manufacturers may continue to meet fuel economy requirements through MY 2029 for any appropriate vehicles based on carryover data from testing performed before MY 2027.

The Alliance for Automotive Innovation requested EPA continue to allow automakers the option to retest on E0 for the litmus assessment [560] to determine whether to use the 5-cycle or 2-cycle testing methodology until the implications of the new E10 test fuel on the complex 5-cycle and litmus methodology can be fully examined and addressed. EPA will allow testing for determining the fuel economy label calculation method under 40 CFR 600.115–11 using either Tier 2 (Indolene) or Tier 3 test fuel provided that the same test fuel must be used for all 5 cycles until such time that EPA updates the 5-cycle adjustment factors through guidance, at which point Tier 3 test fuel must be used.

TABLE 23—FINAL FUEL-RELATED TESTING AND CERTIFICATION REQUIREMENTS

Test fuel	GHG standards			Fuel economy standards			Criteria for determining the fuel economy label calculation method "litmus test"		Fuel cconomy and environment label values		
	Pre-MY 2027	MY 2027–2029	MY 2030 and later	Pre-MY 2027	MY 2027–2029	MY 2030 and later	Pre-MY 2027	MY 2027 and later [a]	Pre-MY 2027	MY 2027–2029	MY 2030 and later
Indolene ..	No CO_2 adjustment required.	Carry-over test results only; Divide CO_2 test results by 1.0166.	Not allowed	No adjustment required.	Carry-over results only; No adjustment required.	Not allowed	Optional: No adjustment required**.	Optional: No adjustment required [b].	No adjustment required.	Carry-over results only; No CO_2 adjustment required.	Not allowed.
Tier 3	Apply proposed CO_2 adjustment (multiply test results by 1.0166).	No CO_2 adjustment required		Apply revised FE equation proposed in 2020 rule			Apply revised FE equation proposed in 2020 rule		Apply revised FE equation proposed in 2020 rule; Apply proposed CO_2 adjustment (multiply test results by 1.0166).[a]		

[a] Until EPA updates the 5-cycle adjustment factors through guidance.
[b] When performing testing for determining the fuel economy label calculation method under § 600.115–11, the same test fuel must be used for all 5 cycles.

The Alliance for Automotive Innovation (AAI) submitted comments that are nearly identical to the comments they submitted for the original 2020 Tier 3 Test Fuel NPRM. AAI submitted five specific comments on this rulemaking, each of which we have addressed in this FRM:

- Do Not Adjust the Tailpipe CO_2 Value for E10: EPA has addressed this comment in this FRM by not adjusting CO_2 values when vehicles are tested using Tier 3 test fuel. The GHG standards finalized in this FRM reflect the use of Tier 3 test fuel as does the feasibility analysis supporting this rule. No adjustment is required when testing on Tier 3 fuel.
- Set the R-Factor Equal to 1.0 for CAFE Performance on E10: EPA is finalizing an R-Factor of 0.81 based on the technical analysis provided in the 2020 Tier 3 Test Fuel NPRM.
- Delay E10 Phase-in, Allow Optional E0 Testing and Carryover of E0 Data and Revisit Any Adjustment as a Part of the Next CAFE/GHG Rulemaking: EPA accepted AAI's recommendation and is finalizing the Tier 3 test fuel change as part of this GHG standard setting rulemaking. In addition, this FRM includes provisions for phase-in of Tier 3 test fuel and the carry-over of data during the phase-in.
- Address the Impact of the E10 Transition on 5-cycle Testing and Litmus Test: EPA accepted this recommendation and has included provisions for addressing 5-cycle testing and the litmus test in this FRM.
- Consider Fuel Economy and Environmental Performance Labeling Impacts: EPA has considered impacts to the label and has included specific provisions in this FRM to address the use of E10 for vehicle testing and the resultant label values.

Several other commenters advised that adjusting CO_2 measurements from Tier 3 test fuel upward by 1.6 percent is improper since E10 test fuel represents market fuel. They also suggest that the proposed adjusted R-value of 0.81 is too low, stating that

[560] The "Litmus test" is the commonly known term used to describe the criteria for determining the fuel economy label calculation method (mpg based derived 5-cycle method or vehicle specific 5-cycle method or the modified 5-cycle method) for 2011 and later model year vehicles, as outlined in 40 CFR 600.115–08.

values around 0.9 have been published in recent literature, and that a value of 1.0 would be optimal as it avoids penalizing ethanol blends. One commenter explained that the computation of the test fuel's heating value and carbon mass fraction should be done using the original ASTM methods used in characterizing the historical reference fuel rather than the more modern methods we proposed, and that those values should account for sulfur and water content.

See section 6.3 of the RTC for a more detailed discussion of comments related to test fuel for fuel economy measurements.

3. Medium-Duty Vehicle GHG Standards

i. What CO_2 standards curves is EPA finalizing?

Medium-duty vehicles (8,501 to 14,000 pounds GVWR) that are not categorized as MDPVs utilize a ''work-factor'' metric for determining GHG targets. Unlike the light-duty attribute metric of footprint, which is oriented around a vehicle's usage for personal transportation, the work-factor metric is designed around work potential for commercially oriented vehicles and accounts for a combination of payload, towing and 4-wheel drive equipment.

We received comments from the Alliance for Automotive Innovation (Alliance), GM, Ford, and Stellantis that opposed changes to the work factor definition that capped GCWR within the WF calculation to no greater than 22,000 pounds. Both the Alliance and Stellantis opposed the GHG standards for MDV, stating that were too stringent and with Stellantis further characterizing the standards as ''infeasible''. The Alliance and Stellantis specifically cited a 37 percent reduction in GHG from MY 2028 through MY 2032 as too stringent, and that the assumption of 98 percent electrification of van applications within the technology feasibility analysis for the proposal was too high. Stellantis requested that the Agency include PHEV technology for MDVs within its analysis for the final rule. Conversely, ICCT and ACEEE commented that too few MDV BEVs were included within the analysis and argued for more stringent GHG standards for MDV.

Taking all of these comments into consideration, and for the reasons explained below (and in the RTC), we are finalizing the coefficients of the 2032 GHG standards as proposed for work factors less than 5,500 pounds, and we are finalizing the following changes relative to the proposal:

1. We have eliminated the proposed GCWR cap within the work factor equation and have returned to a definition and equation for work factor identical to the one used chassis-certified Class 2b and 3 vehicles under the Heavy-duty Phase 2 GHG Program. Instead, we modified the structure of the MDV GHG standards directly and introduced a flattening of standards above specific work factor set-points.

2. We are finalizing a more gradual and evenly-spaced change in GHG stringency from MY 2027 through 2031.

3. The flattening of standards above specific work factor set-points is phased-in gradually from MY 2028 through 2030.

Our GHG standards for MDVs continue to be entirely chassis-dynamometer based and continue to be work-factor-based as with the previous Heavy-duty Phase 2 standards. We are not finalizing our proposed 22,000-pound GCWR limit within the work factor equation. EPA had proposed this provision with the goal of preventing increases in the GHG emissions not fully captured within the loads and operation reflected during chassis dynamometer GHG emissions testing. Automaker commenters expressed concern that the proposal would disrupt vehicle categories, particularly when taking into consideration updates to the MDPV definition (see section III.E of this preamble). In response to comments, we are finalizing changes to the CO_2 targets which flatten the standards in the following manner:

- At or above a work factor of 8,000 pounds in 2028.
- At or above a work factor of 6,800 pounds in 2029.
- At or above a work factor of 5,500 pounds for model years 2030 and later.

The final standards will continue to use the same work factor (WF) and GHG target definitions (81 FR 73478, October 25, 2016). The testing methodology does not directly incorporate any GCWR (*i.e.,* trailer towing) related direct load or weight increases, however, flattening the standards above a 5,500-pound work factor upper cutpoint addresses concerns of potential windfall compliance credits for higher GCWR ratings and approximately reflects a GCWR of 22,000 pounds. Thus we are finalizing both a CO_2 target equation and WF equation for determining GHG standards that are identical to those used in the heavy-duty Phase 2 GHG program, except with updated coefficients: [561]

CO_2 Target (g/mile) = [a × WF] + b

WF = [0.75 × (Payload Capacity + xwd)] + [0.25 × Towing Capacity]

Payload Capacity = GVWR (pounds) − Curb Weight (pounds)

xwd = 500 pounds for 4wd, 0 lbs. for 2wd

Towing Capacity = GCWR (pounds) − GVWR (pounds)

Final MDV GHG standards for model years 2027 and later are shown in Table 24 and Table 25.

TABLE 24—FINAL COEFFICIENTS FOR MDV GHG STANDARDS

Model year	a	b
2027	0.0348	268
2028 [a]	0.0339	270
2029 [b]	0.0310	246
2030 [c]	0.0280	220
2031 [c]	0.0251	195
2032 [c]	0.0221	170

Applicable WF Thresholds:
[a] Only applicable at WF <8,000 pounds.
[b] Only applicable at WF <6,800 pounds.
[c] Only applicable at WF <5,500 pounds.

TABLE 25—FINAL MDV GHG STANDARDS ABOVE WF THRESHOLDS REFERENCED IN TABLE 24

Model year	WF threshold	GHG standards, g CO_2/mi
2028	WF ≥8,000 lbs ..	541
2029	WF ≥6,800 lbs ..	457
2030	WF ≥5,500 lbs ..	374
2031	WF ≥5,500 lbs ..	333
2032	WF ≥5,500 lbs ..	292

The MDV target GHG standards are compared to the previous Heavy-duty (HD) Phase 2 gasoline standards in Figure 10. For MY 2027, we are finalizing a revision to the HD Phase 2 standards under which gasoline MDVs are subject to fuel-neutral standards identical to the HD Phase 2 diesel standards. MY 2027 standards for diesel MDV remain identical to HD Phase 2. EPA believes the revised MY 2027 MDV standard for gasoline MDV is reasonable given the significant advances in clean vehicle technology since our assessment at the time of the HD Phase 2 rule in 2016. In our assessment conducted during the development of HD Phase 2, we found only one manufacturer had certified HD BEVs through MY 2016, and we projected limited adoption of electric vehicles into the market for MYs 2021 through 2027. However, as discussed in section IV.C.1 of this preamble and RIA Chapter 3.1, there are now a wider range of feasible technology options for manufacturers to apply to the MDV fleet. In addition to ICE-based technologies, manufacturers are actively increasing their PHEV and BEV vehicle offerings in the MDV

[561] Note: There is no 22,000-pound GCWR cap within the WF equation.

default gram per mile values in paragraph (b)(1) of this section do not exceed the allowable limit, and total credits may be determined for each category of vehicles according to paragraph (f) of this section.

(iv) If the value determined in paragraph (b)(2)(i) of this section is greater than the off-cycle credit cap specified in paragraph (b)(2)(v) of this section, then the combined passenger automobile and light truck credits, in Megagrams, that may be accrued using the calculations in paragraph (f) of this section must not exceed the value determined in paragraph (b)(2)(ii) of this section. This limitation should generally be done by reducing the amount of credits attributable to the vehicle category that caused the limit to be exceeded such that the total value does not exceed the value determined in paragraph (b)(2)(ii) of this section.

(v) The manufacturer's combined passenger automobile and light truck fleet average CO_2 emissions attributable to use of the default credit values in paragraph (b)(1) of this section may not exceed the following specific values:

Model year	Off-cycle credit cap (g/mile)
(A) 2023–2026	15
(B) 2027–2030	10
(C) 2031	8.0
(D) 2032	6.0

* * * * *

(f) *Calculation of total off-cycle credits.* Total off-cycle credits in Megagrams of CO_2 (rounded to the nearest whole megagram) shall be calculated separately for passenger automobiles and light trucks according to the following formula:

$$Total\ Credits = \frac{Credit \cdot Production \cdot VLM}{1{,}000{,}000}$$

Where:

Credit = the credit value in grams per mile determined in paragraph (b), (c), or (d) of this section. Starting in model year 2027, multiply the credit value for PHEV by (1–UF), where

UF = the fleet utility factor established under 40 CFR 600.116–12(c)(1) or (c)(10)(iii) (weighted 55 percent city, 45 percent highway).

Production = The total number of passenger automobiles or light trucks, whichever is applicable, produced with the off-cycle technology to which to the credit value determined in paragraph (b), (c), or (d) of this section applies.

VLM = vehicle lifetime miles, which for passenger automobiles shall be 195,264 and for light trucks shall be 225,865.

§ 86.1871–12 [Removed]

■ 90. Remove § 86.1871–12.

PART 600—FUEL ECONOMY AND GREENHOUSE GAS EXHAUST EMISSIONS OF MOTOR VEHICLES

■ 91. The authority citation for part 600 continues to read as follows:

Authority: 49 U.S.C. 32901–23919q, Pub. L. 109–58.

■ 92. Amend § 600.001 by revising paragraph (a) to read as follows:

§ 600.001 General applicability.

(a) The provisions of this part apply to 2008 and later model year automobiles that are not medium duty passenger vehicles ($MDPV_{FE}$), and to 2011 and later model year automobiles including $MDPV_{FE}$. The test procedures in subpart B of this part also apply to 2014 and later heavy-duty vehicles subject to standards under 40 CFR part 86, subpart S.

* * * * *

■ 93. Amend § 600.002 by revising the definitions for ''Engine code'', ''Light truck'', ''Medium-duty passenger vehicle'', ''Subconfiguration'', and ''Vehicle configuration'' to read as follows:

§ 600.002 Definitions.

* * * * *

Engine code means one of the following:

(1) For LDV, LDT, and $MDPV_{FE}$, *engine code* means a unique combination, within a test group (as defined in § 86.1803 of this chapter), of displacement, fuel injection (or carburetion or other fuel delivery system), calibration, distributor calibration, choke calibration, auxiliary emission control devices, and other engine and emission control system components specified by the Administrator. For electric vehicles, *engine code* means a unique combination of manufacturer, electric traction motor, motor configuration, motor controller, and energy storage device.

(2) For HDV, engine code has the meaning given in § 86.1819–14(d)(12) of this chapter.

* * * * *

Light truck means an automobile that is not a passenger automobile, as defined by the Secretary of Transportation at 49 CFR 523.5. This term is interchangeable with ''non-passenger automobile.'' The term ''light truck'' includes medium-duty passenger vehicles ($MDPV_{FE}$) manufactured during 2011 and later model years.

Medium-duty passenger vehicle ($MDPV_{FE}$) means a vehicle that would satisfy the criteria for light trucks as defined by the Secretary of Transportation at 49 CFR 523.5 but for its gross vehicle weight rating or its curb weight, is rated at more than 8,500 lbs GVWR or has a vehicle curb weight of more than 6,000 pounds or has a basic vehicle frontal area in excess of 45 square feet, and is designed primarily to transport passengers, but does not include a vehicle that—

(1) Is an ''incomplete truck'' as defined in 40 CFR 86.1803–01; or

(2) Has a seating capacity of more than 12 persons; or

(3) Is designed for more than 9 persons in seating rearward of the driver's seat; or

(4) Is equipped with an open cargo area (for example, a pick-up truck box or bed) of 72.0 inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area for purposes of this definition.

* * * * *

Subconfiguration means one of the following:

(1) For LDV, LDT, and $MDPV_{FE}$, *subconfiguration* means a unique combination within a vehicle configuration of equivalent test weight, road-load horsepower, and any other operational characteristics or parameters which the Administrator determines may significantly affect fuel economy or CO_2 emissions within a vehicle configuration.

(2) For HDV, subconfiguration has the meaning given in § 86.1819–14(d)(12) of this chapter.

* * * * *

Vehicle configuration means one of the following:

(1) For LDV, LDT, and $MDPV_{FE}$, *vehicle configuration* means a unique combination of basic engine, engine code, inertia weight class, transmission configuration, and axle ratio within a base level.

(2) For HDV, vehicle configuration has the meaning given for ''configuration'' in § 86.1819–14(d)(12) of this chapter.

* * * * *

■ 94. Amend § 600.007 by revising paragraph (b)(4) introductory text to read as follows:

§ 600.007 Vehicle acceptability.

* * * * *

(b) * * *

(4) Each fuel economy data vehicle must meet the same exhaust emission standards as certification vehicles of the respective engine-system combination during the test in which the fuel economy test results are generated. This may be demonstrated using one of the following methods:

* * * * *

§ 600.008 [Amended]

■ 95. Amend § 600.008 by removing paragraphs (b)(1)(iii), (iv), and (v).

■ 96. Revise and republish § 600.011 to read as follows:

§ 600.011 Incorporation by reference.

Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, EPA must publish a document in the **Federal Register** and the material must be available to the public. All approved incorporation by reference (IBR) material is available for inspection at EPA and at the National Archives and Records Administration (NARA). Contact EPA at: U.S. EPA, Air and Radiation Docket Center, WJC West Building, Room 3334, 1301 Constitution Ave. NW, Washington, DC 20004; *www.epa.gov/dockets*; (202) 202–1744. For information on inspecting this material at NARA, visit *www.archives.gov/federal-register/cfr/ibr-locations.html* or email *fr.inspection@nara.gov*. The material may be obtained from the following sources:

(a) *ASTM International (ASTM).* ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959; (610) 832–9585; *www.astm.org*.

(1) ASTM D86–23, Standard Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure; Approved March 1, 2023; IBR approved for § 600.113–12(f).

(2) ASTM D975–13a, Standard Specification for Diesel Fuel Oils, Approved December 1, 2013; IBR approved for § 600.107–08(b).

(3) ASTM D1298–12b, Standard Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method, Approved June 1, 2012; IBR approved for §§ 600.113–12(f); 600.510–12(g).

(4) ASTM D1319–20a, Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption, Approved August 1, 2020; IBR approved for § 600.113–12(f).

(5) ASTM D1945–03 (Reapproved 2010), Standard Test Method for Analysis of Natural Gas By Gas Chromatography, Approved January 1, 2010; IBR approved for § 600.113–12(f) and (k).

(6) ASTM D3338/D3338M–20a, Standard Test Method for Estimation of Net Heat of Combustion of Aviation Fuels, Approved December 1, 2020; IBR approved for § 600.113–12(f).

(7) ASTM D3343–22, Standard Test Method for Estimation of Hydrogen Content of Aviation Fuels, Approved November 1, 2022; IBR approved for § 600.113–12(f).

(8) ASTM D4052–22, Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter, Approved May 1, 2022; IBR approved for § 600.113–12(f).

(9) ASTM D4815–22, Standard Test Method for Determination of MTBE, ETBE, TAME, DIPE, tertiary-Amyl Alcohol and C_1 to C_4 Alcohols in Gasoline by Gas Chromatography, Approved April 1, 2022; IBR approved for § 600.113–12(f).

(10) ASTM D5599–22, Standard Test Method for Determination of Oxygenates in Gasoline by Gas Chromatography and Oxygen Selective Flame Ionization Detection, Approved April 1, 2022; IBR approved for § 600.113–12(f).

(11) ASTM D5769–22, Standard Test Method for Determination of Benzene, Toluene, and Total Aromatics in Finished Gasolines by Gas Chromatography/Mass Spectrometry, Approved July 1, 2022; IBR approved for § 600.113–12(f).

(b) *International Organization for Standardization (ISO).* International Organization for Standardization, Case Postale 56, CH–1211 Geneva 20, Switzerland; (41) 22749 0111; *central@iso.org*; *www.iso.org*.

(1) ISO/IEC 18004:2006(E), Information technology—Automatic identification and data capture techniques—QR Code 2005 bar code symbology specification, Second Edition, September 1, 2006; IBR approved for § 600.302–12(b).

(2) [Reserved]

(c) *SAE International (SAE).* SAE International, 400 Commonwealth Dr., Warrendale, PA 15096–0001; (877) 606–7323 (U.S. and Canada) or (724) 776–4970 (outside the U.S. and Canada); *www.sae.org*.

(1) Motor Vehicle Dimensions—Recommended Practice SAE 1100a (Report of Human Factors Engineering Committee, Society of Automotive Engineers, approved September 1973 as revised September 1975); IBR approved for § 600.315–08(c).

(2) SAE J1634 JUL2017, Battery Electric Vehicle Energy Consumption and Range Test Procedure, Revised July 2017; IBR approved for §§ 600.116–12(a); 600.210–12(d); 600.311–12(j) and (k).

(3) SAE J1711 FEB2023, Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-In Hybrid Vehicles; Revised February 2023; IBR approved for §§ 600.114–12(c) and (f); 600.116–12(b) and (c); 600.311–12(c), (j), and (k).

■ 97. Add § 600.101 to subpart B to read as follows:

§ 600.101 Testing overview.

Perform testing under this part as described in § 600.111. This involves the following specific requirements:

(a) Perform the following tests and calculations for LDV, LDT, and $MDPV_{FE}$:

(1) Testing to demonstrate compliance with Corporate Average Fuel Economy standards and greenhouse gas emission standards generally involves a combination of two cycles—the Federal Test Procedure and the Highway Fuel Economy Test (see 40 CFR 1066.801). Testing to determine values for fuel economy labeling under subpart D of this part generally involves testing with three additional test cycles; § 600.210 describes circumstances in which testing with these additional test cycles does not apply for labeling purposes.

(2) Calculate fuel economy and CREE values for vehicle subconfigurations, configurations, base levels, and model types as described in §§ 600.206 and 600.208. Calculate fleet average values for fuel economy and CREE as described in § 600.510.

(3) Determine fuel economy values for labeling as described in § 600.210 using either the vehicle-specific 5-cycle method or the derived 5-cycle method as described in § 600.115.

(i) For vehicle-specific 5-cycle labels, the test vehicle (subconfiguration) data are adjusted to better represent in-use fuel economy and CO_2 emissions based on the vehicle-specific equations in § 600.114. Sections 600.207 and 600.209

describe how to use the ''adjusted'' city and highway subconfiguration values to calculate adjusted values for the vehicle configuration, base level, and the model type. These ''adjusted'' city, highway, and combined fuel economy estimates and the combined CO_2 emissions for the model type are shown on fuel economy labels.

(ii) For derived 5-cycle labels, calculate ''unadjusted'' fuel economy and CO_2 values for vehicle subconfigurations, configurations, base levels, and model types as described in §§ 600.206 and 600.208. Section 600.210 describes how to use the unadjusted model type values to calculate ''adjusted'' model type values for city, highway, and combined fuel economy and CO_2 emissions using the derived 5-cycle equations for the fuel economy label.

(4) Diesel-fueled Tier 3 vehicles are not subject to cold temperature emission standards; however, you must test at least one vehicle in each test group over the cold temperature FTP to comply with requirements of this part. This paragraph (a)(4) does not apply for Tier 4 vehicles.

(b) Perform the following tests and calculations for all chassis-tested vehicles other than LDV, LDT, and $MDPV_{FE}$ that are subject to standards under 40 CFR part 86, subpart S:

(1) Test vehicles as described in 40 CFR 86.1811, 86.1816, and 86.1819. Testing to demonstrate compliance with CO_2 emission standards generally involves a combination of two cycles for each test group—the Federal Test Procedure and the Highway Fuel Economy Test (see 40 CFR 1066.801). Fuel economy labeling requirements do not apply for vehicles above 8,500 pounds GVWR, except for $MDPV_{FE}$.

(2) Determine fleet average CO_2 emissions as described in 40 CFR 86.1819–14(d)(9). These CO_2 emission results are used to calculate corresponding fuel consumption values to demonstrate compliance with fleet average fuel consumption standards under 49 CFR part 535.

(c) Manufacturers must use E10 gasoline test fuel as specified in 40 CFR 1065.710(b) for new testing to demonstrate compliance with all emission standards and to determine fuel economy values. This requirement starts in model year 2027. Interim provisions related to test fuel apply as described in § 600.117.

■ 98. Amend § 600.113–12 by:

■ a. Revising the introductory text and paragraphs (f)(1) and (n).

■ b. Redesignating paragraph (o) as paragraph (p).

■ c. Adding new paragraph (o).

The revisions and addition read as follows:

§ 600.113–12 Fuel economy, CO_2 emissions, and carbon-related exhaust emission calculations for FTP, HFET, US06, SC03 and cold temperature FTP tests.

The Administrator will use the calculation procedure set forth in this section for all official EPA testing of vehicles fueled with gasoline, diesel, alcohol-based or natural gas fuel. The calculations of the weighted fuel economy and carbon-related exhaust emission values require input of the weighted grams/mile values for total hydrocarbons (HC), carbon monoxide (CO), and carbon dioxide (CO_2); and, additionally for methanol-fueled automobiles, methanol (CH_3OH) and formaldehyde (HCHO); and, additionally for ethanol-fueled automobiles, methanol (CH_3OH), ethanol (C_2H_5OH), acetaldehyde (C_2H_4O), and formaldehyde (HCHO); and additionally for natural gas-fueled vehicles, non-methane hydrocarbons (NMHC) and methane (CH_4). For manufacturers selecting the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter the calculations of the carbon-related exhaust emissions require the input of grams/mile values for nitrous oxide (N_2O) and methane (CH_4). Emissions shall be determined for the FTP, HFET, US06, SC03, and cold temperature FTP tests. Additionally, the specific gravity, carbon weight fraction and net heating value of the test fuel must be determined. The FTP, HFET, US06, SC03, and cold temperature FTP fuel economy and carbon-related exhaust emission values shall be calculated as specified in this section. An example fuel economy calculation appears in appendix II to this part.

* * * * *

(f) * * *

(1) Gasoline test fuel properties shall be determined by analysis of a fuel sample taken from the fuel supply. A sample shall be taken after each addition of fresh fuel to the fuel supply. Additionally, the fuel shall be resampled once a month to account for any fuel property changes during storage. Less frequent resampling may be permitted if EPA concludes, on the basis of manufacturer-supplied data, that the properties of test fuel in the manufacturer's storage facility will remain stable for a period longer than one month. The fuel samples shall be analyzed to determine fuel properties as follows for neat gasoline (E0) and for a low-level ethanol-gasoline blend (E10):

(i) *Specific gravity.* Determine specific gravity using ASTM D4052 (incorporated by reference, see § 600.011). Note that ASTM D4052 refers to specific gravity as relative density.

(ii) *Carbon mass fraction.* (A) For E0, determine hydrogen mass percent using ASTM D3343 (incorporated by reference, see § 600.011), then determine carbon mass fraction as $CMF = 1 - 0.01 \times$ hydrogen mass percent.

(B) For E10, determine carbon mass fraction of test fuel, CMF_f, using the following equation, rounded to three decimal places:

$$CMF_f = VF_e \cdot \frac{SG_e}{SG_f} \cdot CMF_e + \left(1 - VF_e \cdot \frac{SG_e}{SG_f}\right) \cdot CMF_h$$

Where:

VF_e = volume fraction of ethanol in the test fuel as determined from ASTM D4815 or ASTM D5599 (both incorporated by reference, see § 600.011). Calculate the volume fraction by dividing the volume percent of ethanol by 100.

SG_e = specific gravity of pure ethanol. Use $SG_e = 0.7939$.

SG_f = specific gravity of the test fuel as determined by ASTM D1298 or ASTM D4052 (both incorporated by reference, see § 600.011).

CMF_e = carbon mass fraction of pure ethanol. Use $CMF_e = 0.5214$.

CMF_h = carbon mass fraction of the hydrocarbon fraction of the test fuel as determined using ASTM D3343 (incorporated by reference, see § 600.011) with the following inputs, using V_{Tier3} or V_{LEVIII} as appropriate:

$$A = \text{aromatics content of the hydrocarbon fraction} = \frac{VP_{\text{aro,f}}}{1 - VF_{\text{e}}}.$$

$$G = \text{API gravity of the hydrocarbon fraction} = \frac{141.5}{SG_{\text{h}}} - 131.5.$$

$$V_{\text{Tier3}} = \text{average volatility of the hydrocarbon fraction for EPA's E10 test fuel.}$$

$$V_{\text{Tier3}} = \frac{T_{10} + T_{50} + T_{90}}{3} + 14.8.$$

$$V_{\text{LEVIII}} = \text{average volatility of the LEV III hydrocarbon fraction.}$$

$$V_{\text{LEVIII}} = \frac{T_{10} + T_{50} + T_{90}}{3} + 11.8.$$

Where:

$VP_{\text{aro,f}}$ = volume percent aromatics in the test fuel as determined by ASTM D1319 (incorporated by reference, see § 600.011). An acceptable alternative method is ASTM D5769 (incorporated by reference, see § 600.011), as long as the result is bias-corrected as described in ASTM D1319.

$$SG_{\text{h}} = \text{specific gravity of the hydrocarbon fraction} = \frac{SG_{\text{f}} - SG_{\text{e}} \cdot VF_{\text{e}}}{1 - VF_{\text{e}}}.$$

T_{10}, T_{50}, T_{90} = the 10, 50, and 90 percent distillation temperatures of the test fuel, respectively, in degrees Fahrenheit, as determined by ASTM D86 (incorporated by reference, see § 600.011).

(iii) *Net heat of combustion.* (A) For E0, determine net heat of combustion in MJ/kg using ASTM D3338/D3338M (incorporated by reference, see § 600.011).

(B) For E10, determine net heat of combustion, NHC_{f}, in MJ/kg using the following equation, rounding the result to the nearest whole number:

$$NHC_{\text{f}} = VF_{\text{e}} \cdot \frac{SG_{\text{e}}}{SG_{\text{f}}} \cdot NHC_{\text{e}} + \left(1 - VF_{\text{e}} \cdot \frac{SG_{\text{e}}}{SG_{\text{f}}}\right) \cdot NHC_{\text{h}}$$

Where:

NHC_{e} = net heat of combustion of pure ethanol. Use NHC_{e} = 11,530 Btu/lb.

NHC_{h} = net heat of combustion of the hydrocarbon fraction of the test fuel as determined using ASTM D3338 (incorporated by reference, see § 600.011) using input values as specified in paragraph (f)(1)(ii) of this section.

* * * * *

(n) Manufacturers may use a value of 0 grams CO_2 and CREE per mile to represent the emissions of electric vehicles and the electric operation of plug-in hybrid electric vehicles derived from electricity generated from sources that are not onboard the vehicle.

(o)(1) For testing with E10, calculate fuel economy using the following equation, rounded to the nearest 0.1 miles per gallon:

$$FE_{[\text{interval}]} = \frac{(CMF_{\text{testfuel}} \cdot SG_{\text{testfuel}}) \cdot (\rho_{\text{H2O}} \cdot SG_{\text{basefuel}} \cdot NHC_{\text{basefuel}})}{[(CMF_{\text{testfuel}} \cdot \text{NMOG}) + (0.749 \cdot \text{CH}_4) + (0.429 \cdot \text{CO}) + (0.273 \cdot \text{CO}_2)] \cdot [(R_a \cdot SG_{\text{testfuel}} \cdot NHC_{\text{testfuel}}) + (SG_{\text{basefuel}} \cdot NHC_{\text{basefuel}} \cdot (1 - R_a))]}$$

Where:

CMF_{testfuel} = carbon mass fraction of the test fuel, expressed to three decimal places.

SG_{testfuel} = the specific gravity of the test fuel as obtained in paragraph (f)(1) of this section, expressed to three decimal places.

ρ_{H2O} = the density of pure water at 60 °F. Use ρ_{H2O} = 3781.69 g/gal.

SG_{basefuel} = the specific gravity of the 1975 base fuel. Use SG_{basefuel} = 0.7394.

NHC_{basefuel} = net heat of combustion of the 1975 base fuel. Use NHC_{basefuel} = 43.047 MJ/kg.

NMOG = NMOG emission rate over the test interval or duty cycle in grams/mile.

CH_4 = CH_4 emission rate over the test interval or duty cycle in grams/mile.

CO = CO emission rate over the test interval or duty cycle in grams/mile.

CO_2 = measured tailpipe CO_2 emission rate over the test interval or duty cycle in grams/mile.

R_a = sensitivity factor that represents the response of a typical vehicle's fuel economy to changes in fuel properties, such as volumetric energy content. Use R_a = 0.81.

NHC_{testfuel} = net heat of combustion by mass of test fuel as obtained in paragraph (f)(1) of this section, expressed to three decimal places.

(2) Use one of the following methods to calculate the carbon-related exhaust emissions for testing model year 2027 and later vehicles with the E10 test fuel specified in 40 CFR 1065.710(b):

(i) For manufacturers not complying with the fleet averaging option for N_2O and CH_4 as allowed under 40 CFR 86.1818–12(f)(2), calculate CREE using

the following equation, rounded to the nearest whole gram per mile:

$CREE = (CMF/0.273 \cdot NMOG) + (1.571 \cdot CO) + CO_2 + (0.749 \cdot CH_4)$

Where:

CREE = carbon-related exhaust emissions.
CMF = carbon mass fraction of test fuel as obtained in paragraph (f)(1) of this section and rounded according to paragraph (g)(3) of this section.
NMOG = NMOG emission rate obtained in 40 CFR 1066.635 in grams/mile.
CO = CO emission rate obtained in paragraph (g)(2) of this section in grams/mile.
CO_2 = measured tailpipe CO_2 emission rate obtained in paragraph (g)(2) of this section in grams/mile.
CH_4 = CH_4 emission rate obtained in paragraph (g)(2) of this section in grams/mile.

(ii) For manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under 40 CFR 86.1818–12(f)(2), calculate CREE using the following equation, rounded to the nearest whole gram per mile:

$CREE = [(CMF/0.273) \cdot NMOG] + (1.571 \cdot CO) + CO_2 + (298 \cdot N_2O) + (25 \cdot CH_4)$

Where:

CREE = the carbon-related exhaust emissions as defined in § 600.002.
NMOG = NMOG emission rate obtained in 40 CFR 1066.635 in grams/mile.
CO = CO emission rate obtained in paragraph (g)(2) of this section in grams/mile.
CO_2 = measured tailpipe CO_2 emission rate obtained in paragraph (g)(2) of this section in grams/mile.
N_2O = N_2O emission rate obtained in paragraph (g)(2) of this section in grams/mile.
CH_4 = CH_4 emission rate obtained in paragraph (g)(2) of this section in grams/mile.
CMF = carbon mass fraction of test fuel as obtained in paragraph (f)(1) of this section and rounded according to paragraph (g)(3) of this section.

* * * * *

■ 99. Amend § 600.114–12 by revising paragraphs (d)(2), (e)(3), (f)(1) introductory text, (f)(2) introductory text, and (f)(4) to read as follows:

§ 600.114–12 Vehicle-specific 5-cycle fuel economy and carbon-related exhaust emission calculations.

* * * * *

(d) * * *

(2) To determine City CO_2 emissions, use the appropriate CO_2 gram/mile values expressed to the nearest 0.1 gram/mile instead of CREE values in the equations in this paragraph (d). The appropriate CO_2 values for fuel economy labels based on testing with E10 test fuel are the measured tailpipe CO_2 emissions for the test cycle multiplied by 1.0166.

* * * * *

(e) * * *

(3) To determine Highway CO_2 emissions, use the appropriate CO_2 gram/mile values expressed to the nearest 0.1 gram/mile instead of CREE values in the equations in this paragraph (e) The appropriate CO_2 values for fuel economy labeling based on testing with E10 test fuel are the measured tailpipe CO_2 emissions for the test cycle multiplied by 1.0166.

* * * * *

(f) * * *

(1) If the 4-bag sampling method is used, manufacturers may use the equations in paragraphs (a) and (b) of this section to determine city and highway CO_2 and carbon-related exhaust emissions values. The appropriate CO_2 emission input values for fuel economy labeling based on testing with E10 test fuel are the measured tailpipe CO_2 emissions for the test cycle multiplied by 1.0166. If this method is chosen, it must be used to determine both city and highway CO_2 emissions and carbon-related exhaust emissions. Optionally, the following calculations may be used, provided that they are used to determine both city and highway CO_2 and carbon-related exhaust emissions values:

* * * * *

(2) If the 2-bag sampling method is used for the 75 °F FTP test, it must be used to determine both city and highway CO_2 emissions and carbon-related exhaust emissions. The appropriate CO_2 emission input values for fuel economy labeling based on testing with E10 test fuel are the measured tailpipe CO_2 emissions for the test cycle multiplied by 1.0166. The following calculations must be used to determine both city and highway CO_2 emissions and carbon-related exhaust emissions:

* * * * *

(4) To determine City and Highway CO_2 emissions, use the appropriate CO_2 gram/mile values expressed to the nearest 0.1 gram/mile instead of CREE values in the equations in paragraphs (f)(1) through (3) of this section.

* * * * *

■ 100. Amend § 600.115–11 by revising the introductory text to read as follows:

§ 600.115–11 Criteria for determining the fuel economy label calculation method.

This section provides the criteria to determine if the derived 5-cycle method for determining fuel economy label values, as specified in § 600.210–08(a)(2) or (b)(2) or § 600.210–12(a)(2) or (b)(2), as applicable, may be used to determine label values. Separate criteria apply to city and highway fuel economy for each test group. The provisions of this section are optional. If this option is not chosen, or if the criteria provided in this section are not met, fuel economy label values must be determined according to the vehicle-specific 5-cycle method specified in § 600.210–08(a)(1) or (b)(1) or § 600.210–12(a)(1) or (b)(1), as applicable. However, dedicated alternative-fuel vehicles (other than battery electric vehicles and fuel cell vehicles), dual fuel vehicles when operating on the alternative fuel, $MDPV_{FE}$, and vehicles imported by Independent Commercial Importers may use the derived 5-cycle method for determining fuel economy label values whether or not the criteria provided in this section are met. Manufacturers may alternatively account for this effect for battery electric vehicles, fuel cell vehicles, and plug-in hybrid electric vehicles (when operating in the charge-depleting mode) by multiplying 2-cycle fuel economy values by 0.7 and dividing 2-cycle CO_2 emission values by 0.7.

* * * * *

■ 101. Amend § 600.116–12 by revising paragraphs (b), (c)(1), (2), (5), (6), (7), and (10), and adding paragraph (c)(11) to read as follows:

§ 600.116–12 Special procedures related to electric vehicles and hybrid electric vehicles.

* * * * *

(b) Determine performance values for hybrid electric vehicles that have no plug-in capability as specified in §§ 600.210 and 600.311 using the procedures for charge-sustaining operation from SAE J1711 (incorporated by reference in § 600.011). We may approve alternate measurement procedures with respect to these vehicles if that is necessary or appropriate for meeting the objectives of this part. For example, we may approve alternate Net Energy Change/Fuel Ratio tolerances for charge-sustaining operation as described in paragraph (c)(5) of this section.

(c) * * *

(1) To determine CREE values to demonstrate compliance with GHG standards, calculate composite values representing combined operation during charge-depleting and charge-sustaining operation using the following utility factors, except as otherwise specified in this paragraph (c):

TABLE 1 TO PARAGRAPH (c)(1)—FLEET UTILITY FACTORS FOR URBAN "CITY" DRIVING

Schedule range for UDDS phases, miles	Model year 2030 and earlier		Model year 2031 and later	
	Cumulative UF	Sequential UF	Cumulative UF	Sequential UF
3.59	0.125	0.125	0.062	0.062
7.45	0.243	0.117	0.125	0.062
11.04	0.338	0.095	0.178	0.054
14.90	0.426	0.088	0.232	0.053
18.49	0.497	0.071	0.278	0.046
22.35	0.563	0.066	0.324	0.046
25.94	0.616	0.053	0.363	0.040
29.80	0.666	0.049	0.403	0.040
33.39	0.705	0.040	0.437	0.034
37.25	0.742	0.037	0.471	0.034
40.84	0.772	0.030	0.500	0.029
44.70	0.800	0.028	0.530	0.029
48.29	0.822	0.022	0.555	0.025
52.15	0.843	0.021	0.580	0.025
55.74	0.859	0.017	0.602	0.022
59.60	0.875	0.016	0.624	0.022
63.19	0.888	0.013	0.643	0.019
67.05	0.900	0.012	0.662	0.019
70.64	0.909	0.010	0.679	0.017

TABLE 2 TO PARAGRAPH (c)(1)—FLEET UTILITY FACTORS FOR HIGHWAY DRIVING

Schedule range for HFET, miles	Model year 2030 and earlier		Model year 2031 and later	
	Cumulative UF	Sequential UF	Cumulative UF	Sequential UF
10.3	0.123	0.123	0.168	0.168
20.6	0.240	0.117	0.303	0.136
30.9	0.345	0.105	0.414	0.110
41.2	0.437	0.092	0.503	0.090
51.5	0.516	0.079	0.576	0.073
61.8	0.583	0.067	0.636	0.060
72.1	0.639	0.056	0.685	0.049

(2) Determine fuel economy values to demonstrate compliance with CAFE standards as follows:

(i) For vehicles that are not dual fueled automobiles, determine fuel economy using the utility factors specified in paragraph (c)(1) of this section for model year 2030 and earlier vehicles. Do not use the petroleum-equivalence factors described in 10 CFR 474.3.

(ii) Except as described in paragraph (c)(2)(iii) of this section, determine fuel economy for dual fueled automobiles from the following equation, separately for city and highway driving:

Equation 2 to Paragraph (c)(2)(ii)

$$MPGe_{CAFE} = \frac{1}{\left(\frac{0.5}{MPG_{gas}} + \frac{0.5}{MPG_{elec}}\right)}$$

Where:

MPG_{gas} = The miles per gallon measured while operating on gasoline during charge-sustaining operation as determined using the procedures of SAE J1711.

$MPGe_{elec}$ = The miles per gallon equivalent measured while operating on electricity. Calculate this value by dividing the equivalent all-electric range determined from the equation in § 86.1866–12(b)(2)(ii) by the corresponding measured Watt-hours of energy consumed; apply the appropriate petroleum-equivalence factor from 10 CFR 474.3 to convert Watt-hours to gallons equivalent. Note that if vehicles use no gasoline during charge-depleting operation, $MPGe_{elec}$ is the same as the charge-depleting fuel economy specified in SAE J1711.

(iii) For 2016 and later model year dual fueled automobiles, you may determine fuel economy based on the following equation, separately for city and highway driving:

Equation 3 to Paragraph (c)(2)(iii)

$$MPGe_{CAFE} = \frac{1}{\left(\frac{UF}{MPG_{elec}} + \frac{(1-UF)}{MPGe_{gas}}\right)}$$

Where:

UF = The appropriate utility factor for city or highway driving specified in paragraph (c)(1) of this section for model year 2030 and earlier vehicles.

* * * * *

(5) Instead of the utility factors specified in paragraphs (c)(1) through (3) of this section, calculate utility factors using the following equation for vehicles whose maximum speed is less than the maximum speed specified in the driving schedule, where the vehicle's maximum speed is determined, to the nearest 0.1 mph, from observing the highest speed over the first duty cycle (FTP, HFET, etc.):

Equation 4 to Paragraph (c)(5)

$$UF_i = 1 - \left[\exp\left(-\sum_{j=1}^{k} \left(\left(\frac{d_i}{ND} \right)^j \times C_j \right) \right) \right] - \sum_{i=1}^{n} UF_{i-1}$$

Where:

UF_i = the utility factor for phase *i*. Let $UF_0 = 0$.

j = a counter to identify the appropriate term in the summation (with terms numbered consecutively).

k = the number of terms in the equation (see Table 5 of this section).

d_i = the distance driven in phase *i*.

ND = the normalized distance. Use 399 for both FTP and HFET operation for CAFE and GHG fleet values, except that *ND* = 583 for both FTP and HFET operation for GHG fleet values starting in model year 2031. Use 399 for both FTP and HFET operation for multi-day individual values for labeling.

C_j = the coefficient for term *j* from the following table:

TABLE 5 TO PARAGRAPH (c)(5)—CITY/HIGHWAY SPECIFIC UTILITY FACTOR COEFFICIENTS

j	Fleet values for CAFE for all model years, and for GHG through MY 2030		Fleet values for GHG starting in MY 2031	Multi-day individual values for labeling
	City	Highway	City or highway	City or highway
1	14.86	4.8	10.52	13.1
2	2.965	13	−7.282	−18.7
3	−84.05	−65	−26.37	5.22
4	153.7	120	79.08	8.15
5	−43.59	−100.00	−77.36	3.53
6	−96.94	31.00	26.07	−1.34
7	14.47	.....	.....	−4.01
8	91.70	.....	.....	−3.90
9	−46.36	.....	.....	−1.15
10	.....	.....	.....	3.88

n = the number of test phases (or bag measurements) before the vehicle reaches the end-of-test criterion.

(6) Determine End-of-Test as follows:

(i) Base End-of-Test on a 2 percent State of Charge as specified in Section 3.5.1 of SAE J1711.

(ii) Base End-of-Test on a 1 percent Net Energy Change/Fuel Ratio as specified in Section 3.5.2 of SAE J1711.

(iii) For charge-sustaining tests, we may approve alternate Net Energy Change/Fuel Ratio tolerances as specified in Appendix C of SAE J1711 to correct final fuel economy values, CO_2 emissions, and carbon-related exhaust emissions. For charge-sustaining tests, do not use alternate Net Energy Change/Fuel Ratio tolerances to correct emissions of criteria pollutants. Additionally, if we approve an alternate End-of-Test criterion or Net Energy Change/Fuel Ratio tolerances for a specific vehicle, we may use the alternate criterion or tolerances for any testing we conduct on that vehicle.

(7) Use the vehicle's Actual Charge-Depleting Range, Rcda, as specified in Section 7.1.4 of SAE J1711 for evaluating the end-of-test criterion.

* * * * *

(10) The utility factors described in this paragraph (c) and in § 600.510 are derived from equations in SAE J2841. You may alternatively calculate utility factors from the corresponding equations in SAE J2841 as follows:

(i) Calculate utility factors for labeling directly from the equation in SAE J2841 Section 6.2 using the Table 2 MDIUF Fit Coefficients (C1 through C10) and a normalized distance (norm_dist) of 399 miles.

(ii) Calculate utility factors for fuel economy standards from the equation in SAE J2841 Section 6.2 using the Table 5 Fit Coefficients for city/Hwy Specific FUF curves weighted 55 percent city, 45 percent highway and a normalized distance (norm_dist) of 399 miles.

(iii) Starting in model year 2031, calculate utility factors for GHG compliance with emission standards from the equation in SAE J2841 Section 6.2 using the Table 2 FUF Fit Coefficients (C1 through C6) and a normalized distance (norm_dist) of 583 miles. For model year 2026 and earlier, calculate utility factors for compliance with GHG emission standards as described in paragraph (c)(10)(ii) of this section.

(11) The following methodology is used to determine the usable battery energy (UBE) for a PHEV using data obtained during either the UDDS Full Charge Test (FCT) or the HFET FCT as described in SAE J1711:

(i) Perform the measurements described in SAE J1711 Section 5.1.3.d. Record initial and final SOC of the RESS for each cycle in the FCT.

(ii) Perform the measurements described in SAE J1711 Section 5.1.3.c. Continuously measure the voltage of the RESS throughout the entire cycle, or record initial and final voltage measurements of the RESS for each test cycle.

(iii) Determine average voltage of the RESS during each FCT cycle by averaging the results of the continuous voltage measurement or by determining the average of the initial and final voltage measurement.

(iv) Determine the DC discharge energy for each cycle of the FCT by multiplying the change in SOC of each cycle by the average voltage for the cycle.

(v) Instead of independently measuring current and voltage and calculating the resulting DC discharge energy, you may use a DC wideband Watt-hour meter (power analyzer) to directly measure the DC discharge energy of the RESS during each cycle of the FCT. The meter used for this measurement must meet the requirements in SAE J1711 Section 4.4.

(vi) After completing the FCT, determine the cycles comprising the Charge-Depleting Cycle Range (Rcdc) as described in SAE J1711 Section 3.1.14. Charge-sustaining cycles are not included in the Rcdc. Rcdc includes any number of transitional cycles where the vehicle may have operated in both charge-depleting and charge-sustaining modes.

(vii) Determine the UBE of the PHEV by summing the measured DC discharge energy for each cycle comprising Rcdc. Following the charge-depleting cycles and during the transition to charge-sustaining operation, one or more of the transition cycles may result in negative DC discharge energy measurements that result from the vehicle charging and not discharging the RESS. Include these negative discharge results in the summation.

* * * * *

■ 102. Revise § 600.117 to read as follows:

§ 600.117 Interim provisions.

(a) The following provisions apply instead of other provisions specified in this part through model year 2026:

(1) Except as specified in paragraphs (a)(5) and (6) of this section, manufacturers must demonstrate compliance with greenhouse gas emission standards and determine fuel economy values using E0 gasoline test fuel as specified in 40 CFR 86.113–04(a)(1), regardless of any testing with E10 test fuel specified in 40 CFR 1065.710(b) under paragraph (a)(2) of this section.

(2) Manufacturers may demonstrate that vehicles comply with emission standards for criteria pollutants as specified in 40 CFR part 86, subpart S, during fuel economy measurements using the E0 gasoline test fuel specified in 40 CFR 86.113–04(a)(1), as long as this test fuel is used in fuel economy testing for all applicable duty cycles specified in 40 CFR part 86, subpart S. If a vehicle fails to meet an emission standard for a criteria pollutant using the E0 gasoline test fuel specified in 40 CFR 86.113–04(a)(1), the manufacturer must retest the vehicle using the E10 test fuel specified in 40 CFR 1065.710(b) (or the equivalent LEV III test fuel for California) to demonstrate compliance with all applicable emission standards over that test cycle.

(3) If a manufacturer demonstrates compliance with emission standards for criteria pollutants over all five test cycles using the E10 test fuel specified in 40 CFR 1065.710(b) (or the equivalent LEV III test fuel for California), the manufacturer may use test data with the same test fuel to determine whether a test group meets the criteria described in § 600.115 for derived 5-cycle testing for fuel economy labeling. Such vehicles may be tested over the FTP and HFET cycles with the E0 gasoline test fuel specified in 40 CFR 86.113–04(a)(1) under this paragraph (a)(3); the vehicles must meet the emission standards for criteria pollutants over those test cycles as described in paragraph (a)(2) of this section.

(4) Manufacturers may perform testing with the appropriate gasoline test fuels specified in 40 CFR 86.113–04(a)(1), 40 CFR 86.213(a)(2), and in 40 CFR 1065.710(b) to evaluate whether their vehicles meet the criteria for derived 5-cycle testing under § 600.115. All five tests must use test fuel with the same nominal ethanol concentration.

(5) For IUVP testing under 40 CFR 86.1845, manufacturers may demonstrate compliance with greenhouse gas emission standards using a test fuel meeting specifications for demonstrating compliance with emission standards for criteria pollutants.

(6) Manufacturers may alternatively demonstrate compliance with greenhouse gas emission standards and determine fuel economy values using E10 gasoline test fuel as specified in 40 CFR 1065.710(b). However, manufacturers must then multiply measured CO_2 results by 1.0166 and round to the nearest 0.01 g/mile and calculate fuel economy using the equations appropriate equation for testing with E10 test fuel.

(7) If a vehicle uses an E10 test fuel for evaporative emission testing and E0 is the applicable test fuel for exhaust emission testing, exhaust measurement and reporting requirements apply over the course of the evaporative emission test, but the vehicle need not meet the exhaust emission standards during the evaporative emission test run.

(b) Manufacturers may certify model year 2027 through 2029 vehicles to greenhouse gas emission standards using data with E0 test fuel from testing for earlier model years, subject to the carryover provisions of 40 CFR 86.1839. In the case of the fleet average CO_2 standard, manufacturers must divide the measured CO_2 results by 1.0166 and round to the nearest 0.01 g/mile.

(c) Manufacturers may perform testing under § 600.115–11 using E0 gasoline test fuel as specified in 40 CFR 86.113–04(a)(1) or E10 test fuel as specified in 40 CFR 1065.710(b) until EPA publishes guidance under § 600.210–12(a)(2)(iv) describing when and how to apply 5-cycle adjustment factors based on testing with the E10 test fuel.

■ 103. Amend § 600.206–12 by revising and republishing paragraph (a) to read as follows:

§ 600.206–12 Calculation and use of FTP-based and HFET-based fuel economy, CO_2 emissions, and carbon-related exhaust emission values for vehicle configurations.

(a) Fuel economy, CO_2 emissions, and carbon-related exhaust emissions values determined for each vehicle under § 600.113–08(a) and (b) and as approved in § 600.008(c), are used to determine FTP-based city, HFET-based highway, and combined FTP/Highway-based fuel economy, CO_2 emissions, and carbon-related exhaust emission values for each vehicle configuration for which data are available. Note that fuel economy for some alternative fuel vehicles may mean miles per gasoline gallon equivalent and/or miles per unit of fuel consumed. For example, electric vehicles will determine miles per kilowatt-hour in addition to miles per gasoline gallon equivalent, and fuel cell vehicles will determine miles per kilogram of hydrogen.

(1) If only one set of FTP-based city and HFET-based highway fuel economy values is accepted for a subconfiguration at which a vehicle configuration was tested, these values, rounded to the nearest tenth of a mile per gallon, comprise the city and highway fuel economy values for that subconfiguration. If only one set of FTP-based city and HFET-based highway CO_2 emissions and carbon-related exhaust emission values is accepted for a subconfiguration at which a vehicle configuration was tested, these values, rounded to the nearest gram per mile, comprise the city and highway CO_2 emissions and carbon-related exhaust emission values for that subconfiguration. The appropriate CO_2 values for fuel economy labels based on testing with E10 test fuel are the measured tailpipe CO_2 emissions for the test cycle multiplied by 1.0166.

(2) If more than one set of FTP-based city and HFET-based highway fuel economy and/or carbon-related exhaust emission values are accepted for a vehicle configuration:

(i) All data shall be grouped according to the subconfiguration for which the data were generated using sales projections supplied in accordance with § 600.208–12(a)(3).

(ii) Within each group of data, all fuel economy values are harmonically averaged and rounded to the nearest 0.0001 of a mile per gallon and all CO_2 emissions and carbon-related exhaust emission values are arithmetically averaged and rounded to the nearest tenth of a gram per mile in order to determine FTP-based city and HFET-based highway fuel economy, CO_2 emissions, and carbon-related exhaust emission values for each subconfiguration at which the vehicle configuration was tested. The appropriate CO_2 values for fuel economy labels based on testing with E10 test fuel are the measured tailpipe

CO_2 emissions for the test cycle multiplied by 1.0166.

(iii) All FTP-based city fuel economy, CO_2 emissions, and carbon-related exhaust emission values and all HFET-based highway fuel economy and carbon-related exhaust emission values calculated in paragraph (a)(2)(ii) of this section are (separately for city and highway) averaged in proportion to the sales fraction (rounded to the nearest 0.0001) within the vehicle configuration (as provided to the Administrator by the manufacturer) of vehicles of each tested subconfiguration. Fuel economy values shall be harmonically averaged, and CO_2 emissions and carbon-related exhaust emission values shall be arithmetically averaged. The resultant fuel economy values, rounded to the nearest 0.0001 mile per gallon, are the FTP-based city and HFET-based highway fuel economy values for the vehicle configuration. The resultant CO_2 emissions and carbon-related exhaust emission values, rounded to the nearest tenth of a gram per mile, are the FTP-based city and HFET-based highway CO_2 emissions and carbon-related exhaust emission values for the vehicle configuration. Note that the appropriate vehicle subconfiguration CO_2 values for fuel economy labels based on testing with E10 test fuel are adjusted as described in paragraph (a)(1) or (a)(2)(ii) of this section.

(3)(i) For the purpose of determining average fuel economy under § 600.510, the combined fuel economy value for a vehicle configuration is calculated by harmonically averaging the FTP-based city and HFET-based highway fuel economy values, as determined in paragraph (a)(1) or (2) of this section, weighted 0.55 and 0.45 respectively, and rounded to the nearest 0.0001 mile per gallon. A sample of this calculation appears in appendix II to this part.

(ii) For the purpose of determining average carbon-related exhaust emissions under § 600.510, the combined carbon-related exhaust emission value for a vehicle configuration is calculated by arithmetically averaging the FTP-based city and HFET-based highway carbon-related exhaust emission values, as determined in paragraph (a)(1) or (2) of this section, weighted 0.55 and 0.45 respectively, and rounded to the nearest tenth of gram per mile.

(4) For alcohol dual fuel automobiles and natural gas dual fuel automobiles the procedures of paragraphs (a)(1) or (2) of this section, as applicable, shall be used to calculate two separate sets of FTP-based city, HFET-based highway, and combined values for fuel economy, CO_2 emissions, and carbon-related exhaust emissions for each configuration.

(i) Calculate the city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emission values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emission values from the tests performed using alcohol or natural gas test fuel.

* * * * *

■ 104. Amend § 600.207–12 by revising the section heading and revising and republishing paragraph (a) to read as follows:

§ 600.207–12 Calculation and use of vehicle-specific 5-cycle-based fuel economy and CO_2 emission values for vehicle configurations.

(a) Fuel economy and CO_2 emission values determined for each vehicle under § 600.114 and as approved in § 600.008(c), are used to determine vehicle-specific 5-cycle city and highway fuel economy and CO_2 emission values for each vehicle configuration for which data are available.

(1) If only one set of 5-cycle city and highway fuel economy and CO_2 emission values is accepted for a vehicle configuration, these values, where fuel economy is rounded to the nearest 0.0001 of a mile per gallon and the CO_2 emission value in grams per mile is rounded to the nearest tenth of a gram per mile, comprise the city and highway fuel economy and CO_2 emission values for that configuration. Note that the appropriate vehicle-specific CO_2 values for fuel economy labels based on 5-cycle testing with E10 test fuel are adjusted as described in § 600.114–12.

(2) If more than one set of 5-cycle city and highway fuel economy and CO_2 emission values are accepted for a vehicle configuration:

(i) All data shall be grouped according to the subconfiguration for which the data were generated using sales projections supplied in accordance with § 600.209–12(a)(3).

(ii) Within each subconfiguration of data, all fuel economy values are harmonically averaged and rounded to the nearest 0.0001 of a mile per gallon in order to determine 5-cycle city and highway fuel economy values for each subconfiguration at which the vehicle configuration was tested, and all CO_2 emissions values are arithmetically averaged and rounded to the nearest tenth of gram per mile to determine 5-cycle city and highway CO_2 emission values for each subconfiguration at which the vehicle configuration was tested. Note that the appropriate vehicle-specific CO_2 values for fuel economy labels based on 5-cycle testing with E10 test fuel are adjusted as described in § 600.114–12.

(iii) All 5-cycle city fuel economy values and all 5-cycle highway fuel economy values calculated in paragraph (a)(2)(ii) of this section are (separately for city and highway) averaged in proportion to the sales fraction (rounded to the nearest 0.0001) within the vehicle configuration (as provided to the Administrator by the manufacturer) of vehicles of each tested subconfiguration. The resultant values, rounded to the nearest 0.0001 mile per gallon, are the 5-cycle city and 5-cycle highway fuel economy values for the vehicle configuration.

(iv) All 5-cycle city CO_2 emission values and all 5-cycle highway CO_2 emission values calculated in paragraph (a)(2)(ii) of this section are (separately for city and highway) averaged in proportion to the sales fraction (rounded to the nearest 0.0001) within the vehicle configuration (as provided to the Administrator by the manufacturer) of vehicles of each tested subconfiguration. The resultant values, rounded to the nearest 0.1 grams per mile, are the 5-cycle city and 5-cycle highway CO_2 emission values for the vehicle configuration.

(3) [Reserved]

(4) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the procedures of paragraphs (a)(1) and (2) of this section shall be used to calculate two separate sets of 5-cycle city and highway fuel economy and CO_2 emission values for each configuration.

(i) Calculate the 5-cycle city and highway fuel economy and CO_2 emission values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the 5-cycle city and highway fuel economy and CO_2 emission values from the tests performed using alcohol or natural gas test fuel, if 5-cycle testing has been performed. Otherwise, the procedure in § 600.210–12(a)(3) or (b)(3) applies.

* * * * *

■ 105. Amend § 600.208–12 by revising paragraph (a)(4) and adding paragraph (b)(3)(iii)(C) to read as follows:

§ 600.208–12 Calculation of FTP-based and HFET-based fuel economy, CO_2 emissions, and carbon-related exhaust emissions for a model type.

(a) * * *

(4) Vehicle configuration fuel economy, CO_2 emissions, and carbon-related exhaust emissions, as determined in § 600.206–12(a), (b) or (c),

as applicable, are grouped according to base level.

(i) If only one vehicle configuration within a base level has been tested, the fuel economy, CO_2 emissions, and carbon-related exhaust emissions from that vehicle configuration will constitute the fuel economy, CO_2 emissions, and carbon-related exhaust emissions for that base level. Note that the appropriate vehicle subconfiguration CO_2 values for fuel economy labels based on testing with E10 test fuel are adjusted as referenced in § 600.206–12(a)(2)(iii); those values are used to calculate the base level CO_2 values in this paragraph (a)(4)(i).

(ii) If more than one vehicle configuration within a base level has been tested, the vehicle configuration fuel economy values are harmonically averaged in proportion to the respective sales fraction (rounded to the nearest 0.0001) of each vehicle configuration and the resultant fuel economy value rounded to the nearest 0.0001 mile per gallon; and the vehicle configuration CO_2 emissions and carbon-related exhaust emissions are arithmetically averaged in proportion to the respective sales fraction (rounded to the nearest 0.0001) of each vehicle configuration and the resultant carbon-related exhaust emission value rounded to the nearest tenth of a gram per mile. Note that the appropriate vehicle subconfiguration CO_2 values for fuel economy labels based on testing with E10 test fuel are adjusted as referenced in § 600.206–12(a)(2)(iii); those values are used to calculate the base level CO_2 values in this paragraph (a)(4)(ii).

* * * * *

(b) * * *

(3) * * *

(iii) * * *

(C) Note that the appropriate base level CO_2 values for fuel economy labels based on testing with E10 test fuel are adjusted as referenced in paragraph (a)(4)(i) and (ii) of this section; those values are used to calculate the model type FTP-based city CO_2 values in this paragraph (b)(3)(iii).

* * * * *

■ 106. Amend § 600.209–12 by revising paragraphs (a) introductory text and (b) introductory text to read as follows:

§ 600.209–12 Calculation of vehicle-specific 5-cycle fuel economy and CO_2 emission values for a model type.

(a) *Base level.* 5-cycle fuel economy and CO_2 emission values for a base level are calculated from vehicle configuration 5-cycle fuel economy and CO_2 emission values as determined in § 600.207 for low-altitude tests. Note that the appropriate vehicle-specific CO_2 values for fuel economy labels based on 5-cycle testing with E10 test fuel are adjusted as described in § 600.114–12.

* * * * *

(b) *Model type.* For each model type, as determined by the Administrator, city and highway fuel economy and CO_2 emissions values will be calculated by using the projected sales and fuel economy and CO_2 emission values for each base level within the model type. Separate model type calculations will be done based on the vehicle configuration fuel economy and CO_2 emission values as determined in § 600.207–12, as applicable. Note that the appropriate vehicle-specific CO_2 values for fuel economy labels based on 5-cycle testing with E10 test fuel are adjusted as described in § 600.114–12.

* * * * *

■ 107. Amend § 600.210–12 by revising paragraphs (a)(2)(i)(B), (a)(2)(ii)(B), (b)(2)(i)(B), and (b)(2)(ii)(B) to read as follows:

§ 00.210–12 Calculation of fuel economy and CO_2 emission values for labeling.

(a) * * *

(2) * * *

(i) * * *

(B) For each model type, determine the derived five-cycle city CO_2 emissions using the following equation and coefficients determined by the Administrator:

Derived 5-cycle City CO_2 = City Intercept · A + City Slope · MT FTP CO_2

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

A = 8,887 for gasoline-fueled vehicles, 10,180 for diesel-fueled vehicles, or an appropriate value specified by the Administrator for other fuels.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

MT FTP CO_2 = the model type FTP-based city CO_2 emissions determined under § 600.208–12(b), rounded to the nearest 0.1 grams per mile. Note that the appropriate MT FTP CO_2 input values for fuel economy labels based on testing with E10 test fuel are adjusted as referenced in § 600.208–12(b)(3)(iii).

(ii) * * *

(B) For each model type, determine the derived five-cycle highway CO_2 emissions using the equation below and coefficients determined by the Administrator:

Derived 5-cycle Highway CO_2 = ighway Intercept · A + Highway Slope · MT CO_2

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

A = 8,887 for gasoline-fueled vehicles, 10,180 for diesel-fueled vehicles, or an appropriate value specified by the Administrator for other fuels.

Highway lope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

MT HFET CO_2 = the model type highway CO_2 emissions determined under § 600.208–12(b), rounded to the nearest 0.1 grams per mile. Note that the appropriate the MT HFET CO_2 input values for fuel economy labels based on testing with E10 test fuel are adjusted as referenced in § 600.208–12(b)(3)(iii) and (b)(4).

* * * * *

(b) * * *

(2) * * *

(i) * * *

(B) Determine the derived five-cycle city CO_2 emissions of the configuration using the equation below and coefficients determined by the Administrator:

Derived 5-cycle City CO_2 = City Intercept + City Slope ·Config FTP CO_2

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

Config FTP CO_2 = the configuration FTP-based city CO_2 emissions determined under § 600.206, rounded to the nearest 0.1 grams per mile. Note that the appropriate Config FTP CO_2 input values for fuel economy labels based on testing with E10 test fuel are adjusted as referenced in § 600.206–12(a)(2)(iii).

(ii) * * *

(B) Determine the derived five-cycle highway CO_2 emissions of the configuration using the equation below and coefficients determined by the Administrator:

Derived 5-cycle city Highway CO_2 = Highway Intercept + Highway Slope · Config HFET CO_2

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway lope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Config HFET CO_2 = the configuration highway fuel economy determined under § 600.206, rounded to the nearest tenth. Note that the appropriate Config HFET CO_2 input values for fuel economy labels

based on testing with E10 test fuel are adjusted as referenced in § 600.206–12(a)(2)(iii).

* * * * *

■ 108. Amend § 600.311–12 by revising paragraph (g) to read as follows:

§ 600.311–12 Determination of values for fuel economy labels.

* * * * *

(g) *Smog rating.* Establish a rating for exhaust emissions other than CO_2 based on the applicable emission standards for the appropriate model year as shown in tables 1 through 3 to this paragraph (g). Unless specified otherwise, use the California emission standards to select the smog rating only for vehicles not certified to any EPA standards. For Independent Commercial Importers that import vehicles not subject to the identified emission standards, the vehicle's smog rating is 1. Similarly, if a manufacturer certifies vehicles to emission standards that are less stringent than all the identified standards for any reason, the vehicle's smog rating is 1. If EPA or California emission standards change in the future, we may revise the emission levels corresponding to each rating for future model years as appropriate to reflect the changed standards. If this occurs, we would publish the revised ratings as described in § 600.302–12(k), allowing sufficient lead time to make the changes; we would also expect to initiate a rulemaking to update the smog rating in the regulation.

TABLE 1 TO PARAGRAPH (g)—CRITERIA FOR ESTABLISHING SMOG RATING FOR MODEL YEAR 2030 AND LATER

Rating	U.S. EPA emission standard	California Air Resources Board emission standard
1		ULEV 125.
2	Bin 65 or Bin 70	ULEV70.
3	Bin 55 or Bin 60	ULEV60.
4	Bin 45 or Bin 50	ULEV50.
5	Bin 35 or Bin 40	ULEV40.
6	Bin 25 or Bin 30	SULEV25 or SULEV30.
7	Bin 15 or Bin 20	SULEV15 or SULEV20.
8	Bin 10.	
9	Bin 5.	
10	Bin 0	ZEV.

TABLE 2 TO PARAGRAPH (g)—CRITERIA FOR ESTABLISHING SMOG RATING FOR MODEL YEARS 2025 THROUGH 2029

Rating	U.S. EPA Tier 3 or Tier 4 emission standard	California Air Resources Board LEV III or LEV IV emission standard
1	Bin 160	LEV 160.
2	Bin 125	ULEV125.
4	Bin 55 through Bin 70	ULEV70 or ULEV60.
5	Bin 35 through Bin 50	ULEV50 or ULEV40.
6	Bin 25 or Bin 30	SULEV 25 or SULEV30.
7	Bin 15 or Bin 20	SULEV 15 or SULEV20.
8	Bin 10.	
9	Bin 5.	
10	Bin 0	ZEV.

TABLE 3 TO PARAGRAPH (g)—CRITERIA FOR ESTABLISHING SMOG RATING FOR MODEL YEARS 2018 THROUGH 2024

Rating	U.S. EPA Tier 3 emission standard	U.S EPA Tier 2 emission standard	California Air Resources Board LEV III emission standard
1	Bin 160	Bin 5 through Bin 8	LEV 160.
3	Bin 125, Bin 110	Bin 4	ULEV125.
5	Bin 85, Bin 70	Bin 3	ULEV70.
6	Bin 50		ULEV50.
7	Bin 30	Bin 2	SULEV30.
8	Bin 20		SULEV20.
10	Bin 0	Bin 1	ZEV.

* * * * *

PART 1036—CONTROL OF EMISSIONS FROM NEW AND IN-USE HEAVY-DUTY HIGHWAY ENGINES

■ 109. The authority citation for part 1036 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

■ 110. Amend § 1036.110 by revising paragraph (a) to read as follows:

§ 1036.110 Diagnostic controls.

* * * * *

(a) The requirements of this section apply for engines certified under this part, except in the following circumstances:

(1) Heavy-duty engines intended to be installed in heavy-duty vehicles at or below 14,000 pounds GVWR must meet the OBD requirements in 40 CFR 86.1806–27. Note that 40 CFR 86.1806–27 allows for using later versions of specified OBD requirements from the California Air Resources Board, which includes meeting the 2019 heavy-duty OBD requirements adopted for California and updated emission thresholds as described in this section.

(2) Heavy-duty spark-ignition engines intended to be installed in heavy-duty vehicles above 14,000 pounds GVWR may instead meet the OBD requirements in 40 CFR 86.1806–27 if the same engines are also installed in vehicles