

**DEPARTMENT OF TRANSPORTATION****National Highway Traffic Safety Administration****49 CFR Part 535**

[NHTSA–2020–0079]

RIN 2127–AM28

**Improvements for Heavy-Duty Engine and Vehicle Fuel Efficiency Test Procedures, and Other Technical Amendments**

**AGENCY:** National Highway Traffic Safety Administration, Department of Transportation.

**ACTION:** Proposed rule.

**SUMMARY:** The National Highway Traffic Safety Administration (NHTSA) is proposing minor technical amendments to the test procedures for heavy-duty engines and vehicles to improve accuracy and reduce testing burden. These amendments affect the certification procedures for fuel efficiency standards and related requirements. These proposed amendments increase compliance flexibility, harmonize with other requirements, add clarity, correct errors, and streamline the regulations. Given the nature of the proposed changes, NHTSA does not expect either significant environmental impacts or significant economic impacts for any sector.

**DATES:** *Comments:* Comments are requested on or before November 14, 2022.

**ADDRESSES:** You may send comments, identified by Docket No. NHTSA–2020–0079 by any of the following methods:

- *Federal eRulemaking Portal:*  
<https://www.regulations.gov>. Follow the instructions for sending comments.
- *Fax:* NHTSA: (202) 493–2251.
- *Mail:*
  - Docket Management Facility, M–30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- *Hand Delivery:*
  - West Building, Ground Floor, Rm. W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590, between 9 a.m. and 4 p.m. Eastern Time, Monday through Friday, except Federal holidays.

*Instructions:* All submissions received must include the agency name and docket number or Regulatory Information Number (RIN) for this rulemaking. All comments received will be posted without change to <https://www.regulations.gov>, including any personal information provided.

*Docket:* For access to the dockets to read background documents or comments received, go to <https://www.regulations.gov>, and/or: Docket Management Facility, M–30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590. The Docket Management NHTSA: Docket Management Facility, M–30, U.S. Department of Transportation (DOT), West Building, Ground Floor, Rm. W12–140, 1200 New Jersey Ave. SE, Washington, DC 20590. The DOT Docket Management Facility is open between 9 a.m. and 5 p.m. Eastern Time, Monday through Friday, except Federal holidays. However, due to current COVID–19 restrictions, access to the office is limited. Please call ahead if you plan to drop off or pick up a document to ensure someone is available to assist them. The Docket Management Facility can be reached at (202) 366–9826 or (202) 366–9317 to arrange a drop off/pick up.

**FOR FURTHER INFORMATION CONTACT:**

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**I. General Information***A. Does this action apply to me?*

This action would affect companies that manufacture, sell, or import into the United States new heavy-duty engines and new Class 2b through 8 trucks, including combination tractors, all types of buses, vocational vehicles including municipal, commercial, recreational vehicles, and ¾-ton and 1-ton pickup trucks and vans. The heavy-duty category incorporates all motor vehicles with a gross vehicle weight rating of 8,500 lbs. or greater, and the engines that power them, except for medium-duty passenger vehicles already covered by the corporate average fuel economy standards and greenhouse gas standards issued for light-duty vehicles.<sup>1</sup>

Regulated categories and entities include the following:

<sup>1</sup> <https://www.ecfr.gov/cgi-bin/text-idx?SID=7031ab132d93d2ab3729f7c3b8e412f0&mc=true&node=pt49.6.535&rgn=div5>.

Category	NAICS codes <sup>A</sup>	Examples of potentially regulated entities
Industry .....	333618, 336111, 336112, 336120, 336211, 336212, 336611, 336911, 336999.	Motor vehicle manufacturers and engine manufacturers.
Industry .....	811111, 811112, 811198, 423110 .....	Commercial importers of vehicles and vehicle components.
Industry .....	335312, 811198 .....	Alternative fuel vehicle converters.
Industry .....	326199, 332431 .....	Portable fuel container manufacturers.

<sup>A</sup> North American Industry Classification System (NAICS).

This list is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

#### B. What action is the Agency taking?

This action proposes to amend the regulations that implement our fuel efficiency standards for engines and vehicles. The proposed amendments are technical in nature and include corrections and clarifications to a variety of existing regulatory provisions to improve consistency with related EPA standards and with NHTSA's original intent for those provisions. In other words, this proposal comprises a variety of small changes for multiple types of engines and vehicles.

These amendments parallel similar ones in a rulemaking conducted by the EPA under RIN 2060–AU62. The proposed technical amendments are intended to maintain the alignment of EPA's Medium and Heavy-Duty Vehicle Greenhouse Gas Emissions and NHTSA's Fuel Efficiency Standards. The technical amendments to NHTSA regulations contained in this proposal are both necessary and completely align with the technical amendments finalized by EPA under the parallel rulemaking referenced in this paragraph.

The majority of the amendments being proposed would modify existing test procedures for heavy-duty highway engines and vehicles. These test procedure changes would improve accuracy, and in some cases, reduce test burden.

Other heavy-duty highway amendments would update NHTSA regulations to enhance implementation of existing fuel efficiency standards. For example, some changes would reduce the likelihood that manufacturers would need to conduct unique certification testing for compliance with NHTSA, Canadian, and Californian standards. Some amendments would make it easier for manufacturers to more fully account for the fuel efficiency benefits of advanced fuel efficiency improving technology, which could provide them

the opportunity to generate additional fuel consumption improvements for compliance. These amendments are described in Section II.

Additionally, as a matter of housekeeping, NHTSA is proposing to remove portions of its regulations that were vacated by the United States Court of Appeals for the District of Columbia Circuit. In November 2021, that Court “vacate[d] all portions of the [2016 joint NHTSA and EPA] rule that apply to trailers.” *Truck Trailer Mfrs. Ass'n, Inc. v. EPA*, 17 F.4th 1198, 1200 (D.C. Cir. 2021). The underlying statute authorizes NHTSA to examine the fuel efficiency of and prescribe fuel economy standards for “commercial medium-duty [and/or] heavy-duty on-highway vehicles.” 49 U.S.C. 32902(b)(1)(C); 49 U.S.C. 32902(k)(2). The Court reasoned that trailers do not qualify as “vehicles” when that term is used in the fuel economy context because trailers are motorless and use no fuel. *Truck Trailer Mfrs. Ass'n, Inc.*, 17 F.4th at 1200, 1204–08. Accordingly, the Court held that NHTSA does not have the authority to regulate the fuel economy of trailers. *Id.* at 1208.<sup>2</sup> NHTSA is therefore proposing to remove the vacated trailer provisions from its regulations.

#### C. What are the incremental costs and benefits of this action?

This action would be limited in scope and is not intended to include amendments that would have significant economic or environmental impacts. NHTSA has not drafted a Regulatory Impact Analysis.

<sup>2</sup> For similar reasons, the Court also held that the statute authorizing EPA to regulate the emissions of “motor vehicles” does not encompass trailers. *Id.* at 1200–03. The Court affirmed, however, that both agencies still “can regulate *tractors* based on the *trailers* they pull.” *Id.* at 1208. Moreover, NHTSA is still authorized to regulate trailers in other contexts, such as under 49 U.S.C. Chapter 301. *See* 49 U.S.C. 30102(a)(7) (defining “motor vehicle” to include “a vehicle . . . drawn by mechanical power”); *Truck Trailer Mfrs. Ass'n, Inc.*, 17 F.4th at 1207 (“A trailer is ‘drawn by mechanical power.’”).

## II. Medium and Heavy-Duty Fuel Efficiency Program Technical Amendments

### A. Overview

In September 2011, NHTSA and EPA finalized Phase 1 of the Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles. The Phase 1 program covered new commercial heavy-duty vehicles and work trucks manufactured in model years 2014 to 2018 and beyond, with unique standards for combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles, as well as separate standards for engines in tractors and vocational vehicles. NHTSA and EPA finalized Phase 2 of the standards in October 2016. Besides standards being more stringent, the Phase 2 program also incorporated enhanced test procedures that (among other things) allow individual drivetrain and powertrain performance to be reflected in the vehicle certification process; and included an expanded and improved compliance simulation model.

Since the promulgation of the Phase 2 regulations, manufacturers have been revising their internal test procedures for compliance with the new requirements that begin in model year 2021. In doing so, they have identified to the agencies several areas in which the test procedure regulations could be improved (in terms of overall accuracy, repeatability and clarity) without changing the effective stringency of the standards.

In its May 12, 2020 NPRM, EPA proposed numerous changes to the test procedure regulations to address manufacturers' concerns and to address other issues it had identified. EPA sought comment on those changes and issued a final rule on December 28, 2020 responding to the comments and adjusting the regulatory changes as appropriate. NHTSA has carefully reviewed all technical amendments in the EPA proposal, public comments to the proposal, and the technical amendments that EPA finalized, and is proposing to make technical amendments that parallel the technical amendments that EPA finalized. NHTSA's proposed regulatory changes

described below consist primarily of references and definitions contained in NHTSA regulations which were impacted by the technical amendments finalized by the EPA. This proposal also includes various minor editorial changes to NHTSA regulations that simply correct typographical/formatting errors or revise NHTSA's regulatory text to improve clarity or to update references to EPA regulations that have changed as a result of the EPA technical amendments.

### B. Greenhouse Gas Emission Model Supplemental Notice of Proposed Rulemaking

In conjunction with its final rule issued on December 28, 2020, EPA issued a supplemental notice of proposed rulemaking (SNPRM) proposing further revisions to the Greenhouse Gas Emissions Model (GEM). In the supplemental notice of proposed rulemaking, EPA proposed to revise GEM after consideration of comments solicited and received on the Technical Amendments proposed rule. The details of these changes to the GEM and other considerations are provided on EPA's website.<sup>3</sup>

#### C. 49 CFR 535.1 Scope

NHTSA is proposing to amend the scope provision of 49 CFR part 535 to remove the reference to trailers, consistent with the 2021 D.C. Circuit decision as discussed above.

#### D. 49 CFR 535.3 Applicability

##### 1. 535.3 (a) Enforcement Action Related to Compliance With NHTSA Standards

NHTSA is proposing clarifications to its MDHD fuel efficiency program's applicability and compliance. More specifically, NHTSA is adding the clarification that manufacturers found not to comply with NHTSA's standards or regulations which apply to the construction of new and incomplete vehicles in 49 CFR parts 566 through 568 due to incorrect or fraudulent information will be subject to enforcement in accordance with Chapter 301 of Title 49 and deemed as not complying with Part 535. For example, if a manufacturer is unregistered with NHTSA as a manufacturer, as required by Part 566, or fails to affix an accurate certification label to a complete or incomplete vehicle, then the manufacturer concurrently violates both NHTSA's safety and fuel efficiency

regulations. If the manufacturer is unable to correct its noncompliance(s), the manufacturer fails to comply with NHTSA's fuel efficiency program and is unable to earn fuel efficiency credits or must forfeit its credits, if already issued by NHTSA.

##### 2. 535.3(d)(5) Exclusion of Heavy-Duty Trailers

NHTSA is proposing to delete 535.3(d)(5) consistent with the 2021 D.C. Circuit decision, discussed above.

##### 3. 535.3(e)(1)(i) Vocational Vehicle Tire Speed Rating Exemption

NHTSA is proposing to update this section with a new applicability provision for vocational vehicles, to reflect the rulemaking intention and to be consistent with EPA regulations. The added provision allows for vocational vehicles with a date of manufacture before January 1, 2021 to automatically qualify for an exemption under 40 CFR 1037.631 if the tires installed on the vehicle have a maximum speed rating at or below 55 miles per hour.

##### 4. 535.3(e)(1)(ii) Request for Exemption

NHTSA is proposing to add a second exemption clause to this section where vehicle manufacturers may request exemption under the EPA defined provisions found in 40 CFR 1037.631 and based on other criteria that are equivalent to those specified in 40 CFR 1037.631(a).

##### 5. 535.3(e)(2)(ii) Early Certification for Small Manufacturers

Vehicle manufacturers that qualify as small businesses are exempt from the Phase 1 standards, but must meet the Phase 2 standards beginning January 1, 2022.<sup>4</sup> However, some vehicle families have been certified voluntarily to Phase 1 standards by small manufacturers. In an effort to encourage more voluntary early certification to Phase 1 standards, EPA finalized a new interim provision in 40 CFR 1037.150(y)(4) for small manufacturers that certify their entire U.S.-directed production volume to the Phase 1 standards for calendar year 2021 (*see* 85 FR at 28150). These small manufacturers would be allowed to

certify to the Phase 1 standards for model year 2022, instead of the otherwise applicable Phase 2 standards. The agencies believe that early compliance with the Phase 1 standards should more than offset any reduction in benefits that would otherwise be achieved from meeting Phase 2 standards starting January 1, 2022.<sup>5</sup>

The finalized provision also allows the Phase 1 compliance credits that small manufacturers generate from model year 2018 through 2022 vocational vehicles to be used through model year 2027. Under the existing regulations, all manufacturers that generate vehicle credits under the Phase 1 program can use these credits for compliance in the Phase 2 averaging, banking, and trading program, but these credits are only subject to a five-year credit life. As EPA stated in its final rule, the agencies believe that the limit on credit life can be problematic for small manufacturers with limited product lines which allows them less flexibility in averaging, and the longer credit life will provide them additional flexibility to ensure all their products are fully compliant by the time the Phase 2 standards are fully phased in for model year 2027.

EPA received no adverse comment to either proposal for small manufacturers in § 1037.150(y)(4) and, therefore, finalized the provisions. NHTSA is proposing to implement parallel changes by updating § 535.5(e)(2)(ii) with the same provisions which can be found at § 535.5(e)(2)(ii)(A) and § 535.5(e)(2)(ii)(B), respectively. These changes would also maintain program alignment across both agencies.

##### 6. 535.3(e)(3)—Transitional Allowance for Trailers

NHTSA is proposing to delete 535.3(e)(3) consistent with the 2021 D.C. Circuit decision, discussed above.

##### 7. 535.3(j) Potential Enforcement Actions for Incomplete, Incorrect or Fraudulent Information

NHTSA is proposing to add a new section to the program applicability regulations. This new section provides clarifications and potential outcomes under the NHTSA fuel efficiency program, if EPA denies, suspends or revokes, a manufacturer's certificate of conformity in accordance with 40 CFR 1036.255 or 1037.225, due to incomplete, incorrect or fraudulent information.

<sup>5</sup> EPA stated that it believed that the magnitude of any impact on air quality would be small because of the low production volumes from these small business manufacturers.

<sup>3</sup> "Greenhouse Gas Emissions Model (GEM) for Medium- and Heavy-Duty Vehicle Compliance." (n.d.). <https://www.epa.gov/regulations-emissions-vehicles-and-engines/greenhouse-gas-emissions-model-gem-medium-and-heavy-duty>. Accessed May 18, 2022.

<sup>4</sup> In December 2020, EPA proposed further revisions to the Phase 2 GEM Simulation Model in the December 2020 Notice of Proposed Rulemaking (NRPM) for technical amendments to the GHG Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty VehicleS. EPA's GEM model is released and can be found <https://www.epa.gov/regulations-emissions-vehicles-and-engines/greenhouse-gas-emissions-model-gem-medium-and-heavy-duty> which incorporates the revisions being considered." (last accessed: May 11, 2022)

### E. 49 CFR Part 535.4 Definitions

NHTSA is proposing adding and modifying several definitions to clarify the meaning of certain terms. Almost all of these definitions reference EPA regulatory definitions to ensure alignment of the NHTSA and EPA programs.

#### 1. Adjustable Parameter

NHTSA is proposing to add the definition for *adjustable parameter* as having the meaning given in 40 CFR 1037.801.

#### 2. Alternative Fuel Conversion

NHTSA is proposing to add the definition for *alternative fuel conversion* as having the meaning given in 40 CFR 85.502.

#### 3. Averaging Sets

NHTSA is proposing to delete “long trailer” and “short trailer” in reference to averaging sets definition in HD program, consistent with the 2021 D.C. Circuit decision.

#### 4. Certificate of Conformity

After receiving no adverse comments, EPA finalized clarifying statements related to the information submitted in an application for a certificate of conformity. These clarifying statements are related to determining the date of application submission and the submission date for any potential changes to applications that are deemed incomplete or amended. NHTSA is proposing to update its Certificate of Conformity definition in Part 535 to include the same language finalized by EPA because the clarifications are also applicable to NHTSA’s fuel efficiency program. These changes would also maintain program alignment across the agencies.

#### 5. Hybrid Engine, Hybrid Powertrain, and Hybrid Vehicle

NHTSA is proposing to revise its definition of hybrid engine or hybrid powertrain in 49 CFR part 535.4 to reference directly the EPA definition for these powertrain types found in 1037.801. EPA changed its definitions for “hybrid engine or powertrain” and “hybrid vehicle” to be consistent with the revised hybrid powertrain test procedures it recently finalized in part 1036 subpart F, and the definitions of “hybrid powertrain” and “mild hybrid” added to 40 CFR part 1036. NHTSA is proposing corresponding revisions to the Part 535 definitions that add examples of systems that qualify as hybrid engines or powertrains, specifically systems that recover kinetic

energy and use it to power an electric heater in the aftertreatment.

#### 6. Emission Data Engine

NHTSA is proposing to add the definition for *emission data engine* as having the meaning given in 40 CFR 1036.801.

#### 7. Engine Configuration

NHTSA is proposing to add the definition for *engine configuration* as having the meaning given in 40 CFR 1036.801.

#### 8. Flatbed Trailer

NHTSA is proposing to delete the definition of flatbed trailer, consistent with the 2021 D.C. Circuit decision.

#### 9. Flexible Fuel

NHTSA is proposing to add the definition for *flexible fuel* as having the meaning given in 40 CFR 1036.801.

#### 10. Fuel Type

NHTSA is proposing to add the definition for *fuel type* as having the meaning given in 40 CFR 1036.801.

#### 11. Gear Ratio

NHTSA is proposing to add the definition for *gear ratio* as having the meaning given in 40 CFR 1036.801.

#### 12. Greenhouse Gas

NHTSA is proposing to add the definition for *greenhouse gas* as having the meaning given in 40 CFR 1036.801.

#### 13. Good Engineering Judgment

NHTSA is proposing to add the definition for *good engineering judgement* as having the meaning given in 40 CFR 1068.30.

#### 14. Heavy-Duty Engine

NHTSA is proposing to add the definition for *heavy-duty engine* as having the meaning given in 40 CFR 1036.801 and 49 CFR part 523.

#### 15. Hybrid

NHTSA is proposing to add the definition for *hybrid* as having the meaning given in 40 CFR 1036.801.

#### 16. Identification Number

NHTSA is proposing to add the definition for *identification number* as having the meaning given in 40 CFR 1037.801.

#### 17. Manufacturer

NHTSA is proposing to add the definition for *manufacturer* as having the meaning given in 40 CFR 1037.801.

#### 18. Model Year

NHTSA is proposing revisions to the definition for *model year* as it pertains

to vehicles and engine installations. NHTSA is also proposing to delete references to trailers in this definition, consistent with the 2021 D.C. Circuit decision.

#### 19. Motor Vehicle

NHTSA is proposing to add the definition for *motor vehicle* as having the meaning given in 49 U.S.C. 32901.

#### 20. Multi-Purpose

NHTSA is proposing to add the definition for *multi-purpose* as having the meaning given in 40 CFR 1037.801.

#### 21. Neutral-Idle

NHTSA is proposing to add the definition for *neutral idle* as having the meaning given in 40 CFR 1037.801.

#### 22. New Vehicles

NHTSA is proposing to add the definition for *new vehicles* as having the meaning given to “new motor vehicle” given in 40 CFR 1037.801.

#### 23. Percent

NHTSA is proposing to add the definition for *percent* as having the meaning given in 40 CFR 1037.801.

#### 24. Placed Into Service

NHTSA is proposing to add the definition for *placed into service* as having the meaning given in 40 CFR 1037.801.

#### 25. Phase 2

NHTSA is proposing to delete reference to fuel efficiency and greenhouse gas emissions standards for trailer regulations, consistent with the 2021 D.C. Circuit decision.

#### 26. Regulatory Subcategory

NHTSA is proposing to delete the section (4) reference to trailer subcategory, consistent with the 2021 D.C. Circuit decision.

#### 27. Relating

NHTSA is proposing to add the definition for *relating* as having the meaning given in 40 CFR 1037.801.

#### 28. Round

NHTSA is proposing to add the definition for *round* as having the meaning given in 40 CFR 1065.1001.

#### 29. Standard Payload

NHTSA is proposing to remove the definition of standard payload for trailers, consistent with the 2021 D.C. Circuit decision.

#### 30. Standard Tractor

NHTSA is proposing to correct the definition for *standard tractor* as having

the meaning given in 40 CFR 1037.801 versus the currently defined 40 CFR 1037.501.

### 31. Standard Trailer

NHTSA is proposing to correct the definition for *standard trailer* as having the meaning given in 40 CFR 1037.801 versus the currently defined 40 CFR 1037.501.

### 32. Suspend

NHTSA is proposing to add the definition for *suspend* as having the meaning given in 40 CFR 1037.801.

### 33. Vehicle Service Class

NHTSA is proposing to revise the *vehicle service class* definition found in 49 CFR part 535.4 to directly reference EPA regulation 40 CFR 1037.140.

NHTSA is proposing this revision to avoid redundancy across the agencies and align directly with EPA revisions finalized in their recent technical amendments rulemaking.

The recent EPA technical amendments clarify that the classification for tractors, where provisions are the same as vocational vehicles, are applicable to both hybrid and non-hybrid vehicles. The amendments also clarify that Class 8 hybrid and electric vehicles are Heavy HDVs while all other vehicles are classified by GVWR classes.

EPA explained in its final rule that prior to these revisions, manufacturers had expressed concern that the Phase 2 regulations were not specific enough regarding how to classify hybrid vocational vehicles, because vocational vehicles are generally classified by the class of the engines (as opposed to tractors, which are classified based on GVW), which was not applicable to electrically driven vehicles that have no engine.

### 34. Void

NHTSA is proposing to add the definition for *void* as having the meaning given in 40 CFR 1037.801.

#### F. 49 CFR Part 535.5 Standards

##### 1. 49 CFR Part 535.5(a)

NHTSA is proposing to add clarification to the regulatory standards relating to heavy-duty pickup trucks and vans. More specifically, the agency is proposing adding language that ensures manufacturer options for EPA and NHTSA vehicle standards are aligned. Please refer to the proposed regulatory text for additional details.

##### 2. 49 CFR Part 535.5(b)

NHTSA is proposing to add clarification to the regulatory standards

relating to heavy-duty vocational vehicles. More specifically, the agency is proposing adding language that ensures manufacturer options for EPA and NHTSA vehicle standards are aligned. Please refer to the proposed regulatory text under this section for additional details.

##### 3. 49 CFR Part 535.5(b)(1)

NHTSA is proposing deletion of the mandatory requirements for *all* heavy-duty vocational vehicles to be equipped tire pressure monitoring systems. The proposed revision, however, does not include removal of this mandatory requirement for motorhomes, as specified under 49 CFR part 535.5(b)(6)(vi) and 49 CFR 571.138.

##### 4. 49 CFR Part 535.5(b)(4)

NHTSA is proposing to correct the Vocational HHD Vehicle Regional compression ignition (CI) standards. The current published standard for this vehicle class is incorrect, and does not align with EPA GHG standards for this vehicle type. The incorrect values resulted from an incorrect calculation during the Phase 2 rulemaking which intended to maintain alignment of the NHTSA and EPA standards. The proposed corrected value for this regulatory class is 20.1375 gallons per 1000-ton miles vs. the currently published standard of 20.2358.

##### 5. 49 CFR Part 535.5(c)

NHTSA is proposing to add clarification to the regulatory standards relating to truck tractors. More specifically, the agency is proposing adding language that ensures manufacturer options for EPA and NHTSA vehicle standards are aligned across both agencies. Please refer to the proposed regulatory text for additional details.

##### 6. 49 CFR Part 535.5(c)(5)

NHTSA is proposing to revise its Alternate Fuel Consumption Standards for Tractors above 120,000 GCWR for 2021 model year and later. The revised standards are directly aligned with the revised GHG standards for this class of vehicles proposed and finalized by EPA as part of its technical amendments rulemaking.<sup>6</sup> The revised standards

<sup>6</sup> In December 2020, EPA proposed further revisions to the Phase 2 GEM Simulation Model in the December 2020 Notice of Proposed Rulemaking (NRP) for technical amendments to the GHG Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles and is soliciting comments on these revisions. S. The latest EPA's GEM model is released and can be found <https://www.epa.gov/regulations-emissions-vehicles-and-engines/greenhouse-gas-emissions-model-gem-medium-and-heavy-duty-which>

provide additional clarity on this vehicle class along with fuel efficiency standards that increase in three increments, model years 2021–2023, model years 2024–2026, model years 2026 and later.

As described in EPA's final rulemaking action, the agencies originally defined these alternate fuel consumption and greenhouse-gas standards during the Phase 2 rulemaking, to enable Environment and Climate Change Canada (ECCC) to fully harmonize with the U.S.'s HD Phase 2 standards.

In the interim, ECCC has since adopted final standards for these 120,000 to 140,000 pound GCWR tractors, which differ from the optional standards finalized in Phase 2.<sup>7</sup> Since the purpose of these standards was to facilitate certification of vehicles intended for Canada, EPA proposed optional standards in 40 CFR 1037.670 that would be the same as the final ECCC standards, and did not receive any adverse comments regarding that proposal. NHTSA is proposing to adopt these alternative standards, in gallons per 1,000 ton-miles units, for 120,000 to 140,000-pound GCWR tractors that are equivalent to the EPA and ECCC standards. This would maintain harmonization across the programs for all three agencies.

##### 7. 49 CFR Part 535.5(d)

NHTSA is proposing to add clarifications in 49 CFR part 535.5(d) and 535.6(d) to expand its regulatory provision to optionally accommodate powertrain families and subfamilies added by EPA in 40 CFR 1036.108(a) and 1036.230(d) and (f). The EPA provisions allow manufacturers to apply CO<sub>2</sub> standards to powertrain families and subfamilies. They also allow manufacturers to optionally certify powertrains using the engine testing provisions in 40 CFR 1036 instead of 40 CFR 1037. Manufacturers may choose to include electric powertrain and hybrid electric powertrain emissions in their engine families or subfamilies under part 1036 instead of (or in addition to) the otherwise applicable engine fuel maps. Doing so would provide the same compliance options for manufacturers under the EPA and NHTSA programs.

incorporates the revisions being considered." (last accessed: May 11, 2022)

<sup>7</sup> Regulations Amending the Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations and Other Regulations Made Under the Canadian Environmental Protection Act, 1999: SOR/2018–98, Canada Gazette, Part II, Volume 152, Number 11, May 16, 2018.

## 8. 49 CFR Part 535.5(d)(3)

NHTSA is proposing to correct the Heavy-Duty Engine Fuel Consumption Standards for Phase 1 MHD and HHD compression ignition (CI) tractor engines. The current published standards for these engine classes are incorrect, and do not align with EPA GHG standards for these engine types. The incorrect values resulted from an incorrect calculation during the Phase 2 rulemaking which intended to maintain alignment of the NHTSA and EPA standards. The proposed correct values for these regulatory classes are 4.7839 gallons per 100 hp-hr for MHD CI tractor engines and 4.5187 gallons per 100 hp-hr for HHD CI tractor engines.

## 9. 49 CFR Part 535.5(d)(11)

NHTSA is proposing to correct the *Alternate transition option for Phase 2 engine standards* (A) and (C). The current published standards for these engine standards are incorrect, and do not align with current EPA GHG standards for these engine types. The incorrect values resulted from an incorrect calculation during the Phase 2 rulemaking which intended to maintain alignment for the NHTSA and EPA standards. The proposed corrected values for these regulatory classes are 5.3241 gallons per 100 hp-hr for MHD vocational vehicle engines and 5.0098 gallons per 100 hp-hr for HHD vocational engines.

## 10. 49 CFR Part 535.5(e)

NHTSA is proposing to delete 535.3(e), Heavy Duty Trailer, consistent with the 2021 D.C. Circuit decision, discussed above.

## G. 49 CFR Part 535.6 Measurement and Calculation Procedures

## 1. 49 CFR Part 535.6(b)(1)

NHTSA is proposing to add a reference to EPA's finalized regulation 40 CFR 1037.150 to 49 CFR part 535.6(b)(1). This added reference would provide clear guidance that would be used to determine the proper vehicle and vehicle family to select when determining a manufacturer's regulatory subcategories for vocational vehicles and tractors. The addition would also maintain program alignment across the agencies.

## 2. 49 CFR Part 535.6(b)(4)(ii)

NHTSA is proposing to add a reference to EPA's finalized regulation 40 CFR 1037.525 to 49 CFR part 535.6(b)(4)(ii). This added reference would clarify how to determine a high-roof tractor's aerodynamic performance. EPA finalized this revision to more

clearly relate the drag areas to the defined effective yaw variable, as recommended by EMA as a comment to the EPA proposal.<sup>8</sup> NHTSA is proposing to adopt this same measurement schema to keep programs aligned across the agencies.

## 3. 49 CFR Part 535.6(b)(5)(i)

NHTSA is proposing to revise 49 CFR part 535.6(b)(5)(i) to change the reference to an EPA regulation from 40 CFR 1036.510 to 1036.503. This revision would align the NHTSA regulations with the revised and finalized EPA regulations. This change would keep the programs of both agencies aligned.

## 4. 49 CFR Part 535.6(b)(5)(v)(E)(3)

NHTSA is proposing to add a new requirement in 49 CFR part 535.6(b)(5)(v)(E)(3) that allows manufacturers to characterize torque converters to allow a manufacturer to determine their own torque converter capacity factor instead of using the default value provided in GEM. This change aligns with EPA provisions in 40 CFR 1037.570 and maintains program alignment across both agencies.

## 5. 49 CFR Part 535.6(b)(5)(v)(E)(4)

NHTSA is proposing to add a new requirement in 49 CFR part 535.6(b)(5)(v)(E)(4) to allow vocational vehicles to input a value for neutral coasting in GEM as a compliance option for its fuel consumption program. This revision would align the NHTSA regulations with the EPA regulations in 40 CFR 1037.52 and keep both agencies aligned for program compliance.

## 6. 49 CFR Part 535.6(d)

Like 49 CFR part 535.5(d), NHTSA is proposing to add clarifications in NHTSA 535.6(d) to expand its regulatory provision to optionally accommodate powertrain families and subfamilies added by EPA in 40 CFR 1036.108(a) and 1036.230(d) and (f). The EPA provisions allow manufacturers to apply CO<sub>2</sub> standards to powertrain families and subfamilies. They also allow manufacturers to optionally certify powertrains using the engine testing provisions in 40 CFR 1036 instead of 40 CFR 1037. Manufacturers may choose to include electric powertrain and hybrid electric powertrain emissions in their engine families or subfamilies under part 1036 instead of (or in addition to) the otherwise applicable engine fuel maps. Doing so would provide the same

compliance options for manufacturers under the EPA and NHTSA programs.

## 7. 49 CFR Part 535.6(d)(1)

NHTSA is proposing a consolidation of references to EPA regulation 40 CFR 1036.501 for engines in heavy-duty truck tractors and vocational vehicles that make up each of the manufacturer's regulatory subcategories.

## 8. 49 CFR Part 535.6(d)(2)

Like 49 CFR part 535.6(d), NHTSA is proposing to add clarifications to 535.6(d)(2) that align with the EPA regulation 40 CFR 1036.230(f) and to expand this regulatory provision to accommodate powertrains other than engines and to also include sub-families.

## 9. 49 CFR Part 535.6(d)(3)

NHTSA is proposing to add a new section to 49 CFR part 535.6(d) to address medium and heavy heavy-duty engines. This new subsection (3) mirrors and references the recently finalized EPA technical amendment for 40 CFR 1036.501 addressing the same regulatory items. Subsequently, existing sections 49 CFR part 535.6(d)(3) and 49 CFR part 535.6(d)(4) would be incremented by one as a result of inserting this new section, resulting in the existing 49 CFR part 535.6(d)(3) becoming 49 CFR part 535.6(d)(4), and the existing 49 CFR part 535.6(d)(4) becoming 49 CFR part 535.6(d)(5).

## 10. 49 CFR Part 535.6(d)(3)(ii)

NHTSA is proposing to add clarifications to 49 CFR part 535.6(d)(3)(ii) that expand this regulatory provision to accommodate powertrains other than engines and to also include sub-families.

## 11. 49 CFR Part 535.6(e)

NHTSA is proposing to delete 49 CFR part 535.6(e) reference to heavy duty trailer, consistent with the 2021 D.C. Circuit decision.

## H. 49 CFR 535.7 Averaging, Banking, and Trading (ABT) Credit Program

## 1. 49 CFR Part 535.7(a)

NHTSA is proposing to delete reference to trailer manufacturers, consistent with the 2021 D.C. Circuit decision.

## 2. 49 CFR Part 535.7(a)(2)(v)

NHTSA is proposing to delete reference to application of using bank or trade credit to trailer, consistent with the 2021 D.C. Circuit decision.

<sup>8</sup> The variables  $C_{dA_{\text{effective-yaw-coastdown}}}$  and  $C_{dA_{\text{effective-yaw-alt}}}$  are now  $C_{dA_{\text{coastdown}}(\psi_{\text{eff}})}$  and  $C_{dA_{\text{alt}}(\psi_{\text{eff}})}$ , respectively.

## 3. 49 CFR Part 535.7(a)(3)(v)

NHTSA is proposing to delete reference to trailer manufacturers generating credits, consistent with the 2021 D.C. Circuit decision.

## 4. 49 CFR part 535.7(a)(4)

NHTSA is clarifying its requirements for trading fuel consumption credits. Tractor, vocational vehicle and engine manufacturers may trade credits generated for vehicle or engine families or subfamilies while manufacturers of heavy-duty pickup trucks and vans certified as complete vehicles may trade credits generated for averaging sets. NHTSA is also proposing to delete reference to trading credits earned for compliance with trailer regulations, consistent with the 2021 D.C. Circuit decision.

## 5. 49 CFR Part 535.7(a)(4)(v)

NHTSA is proposing to delete reference to trailer manufacturers generating credits starting in model year 2027 may not bank or trade credits, consistent with the 2021 D.C. Circuit decision.

## 6. 49 CFR Part 535.7(a)(8)

The agency is proposing additions to the credit calculation provisions and to the calculations used for vocational vehicles transitioning to Phase 2 standards. More specifically, NHTSA is proposing to mirror the crediting provisions finalized by EPA as part of their technical amendments rulemaking. These added provisions include extending credit life, allowing off-cycle credits, allowing credit values for automatic tire inflation systems, and allowing automatic engine shutdown systems.

## 7. 49 CFR Part 535.7(a)(9)(iv)(B)

NHTSA is proposing to provide clarifications regarding production limits for drayage tractors under the custom chassis allowance, and how it relates to corporate relationships regarding averaging, banking and trading of credits.

## 8. 49 CFR Part 535.7(a)(11)

NHTSA is proposing regulatory provisions that prevent the calculation of any Phase 1 fuel consumption credits more than once for compliance unless the regulations explicitly allow it.

## 9. 49 CFR Part 535.7(b)(1)

NHTSA is proposing to amend the Total MY Fleet FCC equation because the current CFR shows an incorrect equation.

## 10. 49 CFR Part 535.7(c)(1)

NHTSA is proposing to amend the Vehicle Family FCC equation because the current CFR shows an incorrect equation.

## 11. 49 CFR Part 535.7(d)(1)

NHTSA is proposing to amend the Engine Family FCC equation because the current CFR shows an incorrect equation.

## 12. 49 CFR Part 535.7(d)(7)(ii)

NHTSA is proposing to remove the usage restrictions associated with model year 2021 and earlier vocational engine credits. Manufacturers may use Phase 1 credits in the Phase 2 program using an adjustment factor to prorate credits to compensate for changes in the technologies and drive cycles used in developing the Phase 2 standards. NHTSA is also correcting the adjustment factor values used for the conversion to fuel consumption values in terms of gallons/100 hp-hr versus the currently published grams of CO<sub>2</sub> reference values.

## 13. 49 CFR 535.7(e)

NHTSA is proposing to delete 535.7(e), ABT Provision for Trailers, consistent with the 2021 D.C. Circuit decision, discussed above.

## 14. 49 CFR 535.7(f)(2)(v)

NHTSA is proposing to delete the provision formerly labeled as 535.7(f)(2)(v) reference to application of off-cycle provision to trailers, consistent with the 2021 D.C. Circuit decision, discussed above.

*I. 49 CFR 535.8 Reporting and Recordkeeping Requirements*

## 1. 49 CFR Part 535.8(a)(6)

NHTSA is proposing to amend the address to 1200 New Jersey Avenue, NVS-200, Office W45-306, SE, Washington, DC 20590, because the current CFR shows an incorrect address.

## 2. 49 CFR Part 535.8(b)(11)(i)(C)

Like 49 CFR part 535.6(d), NHTSA is proposing to add clarifications to 49 CFR part 535.8(b)(11)(i)(C) that expand this regulatory provision to accommodate powertrains other than engines and to also include sub-families.

## 3. 49 CFR Part 535.8(c)(13)(h)(i)

NHTSA is proposing additions to this reporting requirement that clarify potential enforcement actions associated with the submission of information that is fraudulent or grossly negligent or otherwise provided in bad faith.

## 4. 49 CFR Part 535.8(g)(12)

NHTSA is proposing to delete reference to requirements for trailer manufacturers, consistent with the 2021 D.C. Circuit decision, discussed above.

*J. 49 CFR 535.9 Enforcement Approach*

## 1. 49 CFR Part 535.9(a)(1)(i)

NHTSA is proposing additional language and clarifications that NHTSA will perform confirmatory testing and collaborate with EPA regarding any potential issues with testing results.

## 2. 49 CFR Part 535.9(a)(1)(v)

NHTSA is proposing additional language and clarifications with respect to any GEM inputs in a manufacturer's application for certification or in the end of the year ABT final reports. The proposed revisions include streamlining references to EPA regulations.

*K. 49 CFR 535.10 How do manufacturers comply with fuel consumption standards?*

## 1. 49 CFR Part 535.10(a)(3)

NHTSA is clarifying that EPA's compliance requirements 40 CFR 1037.601 and 40 CFR part 1068 apply similarly to NHTSA's fuel consumption program, except for the warranty provisions in 40 CFR 1037.601(a)(5).

## 2. 49 CFR Part 535.10(a)(6)

NHTSA is proposing the addition of language clarifying that vehicles required to meet the fuel consumption standards of this part must also comply with the same requirements as specified in the EPA regulation 40 CFR 1037.115.

## 3. 49 CFR Part 535.10(c)

NHTSA is proposing to delete the 535.10(c)(2) reference to box trailers, as well as the 535.10(c)(3) reference to manufacturer's compliance if their trailer meet specified standards, consistent with the 2021 D.C. Circuit decision, discussed above.

**III. Statutory Authority and Executive Order Reviews***A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review*

This action is not a significant regulatory action and was therefore not submitted to the Office of Management and Budget (OMB) for review.

*B. Paperwork Reduction Act (PRA)*

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities



contained in the existing regulations and has assigned OMB control numbers 2060–0104, 2060–0287, 2060–0338, 2060–0545, 2060–0641. This rule clarifies and simplifies procedures without affecting information collection requirements.

#### C. Regulatory Flexibility Act (RFA)

I certify that this action would not have a significant economic impact on a substantial number of small entities under the RFA. In making this determination, the impact of concern is any significant adverse economic impact on small entities. An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden or otherwise has a positive economic effect on the small entities subject to the rule. This proposed action is designed to reduce testing burdens, increase compliance flexibility, and make various corrections and adjustments to compliance provisions. We therefore anticipate no costs and no regulatory burden associated with this proposed rule. We have concluded that this proposed action will have no significant increase in regulatory burden for directly regulated small entities.

#### D. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandate as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The proposed action imposes no enforceable duty on any state, local or tribal governments. Requirements for the private sector do not exceed \$100 million in any one year.

#### E. National Environmental Policy Act (NEPA)

NHTSA has analyzed this proposed rule for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action will not have any significant impact on the quality of the human environment.

#### F. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

#### G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. This proposed rule will be implemented at the Federal level and affects engine and vehicle manufacturers. Thus, Executive Order 13175 does not apply to this action.

#### H. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because there are no environmental health or safety risks created by this action that could present a disproportionate risk to children.

#### I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not a “significant energy action” because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. We have concluded that this action is not likely to have any adverse energy effects because it is designed merely to reduce testing burdens, increase compliance flexibility, and make various corrections and adjustments to compliance provisions.

#### J. National Technology Transfer and Advancement Act (NTTAA)

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (“NTTAA”), Public Law 104–113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs agencies to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This action involves technical standards.

#### K. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

NHTSA believes this action does not have disproportionately high and adverse human health or environmental

effects on minority populations, low-income populations or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). Due to the lack of environmental impact, these proposed regulatory changes will not have a disproportionate adverse effect on minority populations, low-income populations, or indigenous peoples.

#### IV. Regulatory Text

##### List of Subjects in 49 CFR Part 535

Energy conservation, Fuel, Fuel economy, Motor vehicles.

For the reasons discussed in the preamble, the National Highway Traffic Safety Administration proposes to amend 49 CFR part 535 as follows:

##### ■ 1. Revise Part 535 to read as follows:

#### PART 535—MEDIUM- AND HEAVY-DUTY VEHICLE FUEL EFFICIENCY PROGRAM

Sec.	
535.1	Scope.
535.2	Purpose.
535.3	Applicability.
535.4	Definitions.
535.5	Standards.
535.6	Measurement and calculation procedures.
535.7	Averaging, banking, and trading (ABT) credit program.
535.8	Reporting and recordkeeping requirements.
535.9	Enforcement approach.
535.10	How do manufacturers comply with fuel consumption standards?

**Authority:** 49 U.S.C. 32902.

##### § 535.1 Scope.

This part establishes fuel consumption standards pursuant to 49 U.S.C. 32902(k) for work trucks and commercial medium- and heavy-duty on-highway vehicles (hereafter referenced as heavy-duty vehicles), and engines manufactured for sale in the United States. This part establishes a credit program manufacturers may use to comply with standards and requirements for manufacturers to provide reports to the National Highway Traffic Safety Administration regarding their efforts to reduce the fuel consumption of heavy-duty vehicles and engines.

##### § 535.2 Purpose.

The purpose of this part is to reduce the fuel consumption of new heavy-duty vehicles and engines by establishing maximum levels for fuel consumption standards while providing a flexible credit program to assist manufacturers in complying with standards.



**§ 535.3 Applicability.**

(a) This part applies to manufacturers that produce complete and incomplete heavy-duty vehicles as defined in 49 CFR part 523, and to the manufacturers of all heavy-duty engines manufactured for use in the applicable vehicles for each given model year. Incomplete vehicle manufacturers must comply with NHTSA's safety requirements in 49 CFR parts 565, 567 and 568 to comply with part 535. Manufacturers found under this program not to comply with NHTSA's safety standards or regulations which apply to the construction of new and incomplete vehicles in 49 CFR parts 566 through 568 due to incorrect or fraudulent information will be subject to enforcement in accordance with Chapter 301 of Title 49 and deemed as not complying with Part 535. If the manufacturer is unable to correct its noncompliance with NHTSA, the manufacturer fails to comply with the fuel efficiency program and is unable to earn fuel efficiency credits.

(b) This part also applies to alterers, final stage manufacturers, and intermediate manufacturers producing vehicles and engines or assembling motor vehicles or motor vehicle equipment under special conditions. Manufacturers comply with this part by following the special conditions in 40 CFR 1037.620, 1037.621, and 1037.622 in which EPA allows manufacturer to:

(1) Share responsibility for the vehicles they produce. Manufacturers sharing responsibility for complying with emissions and fuel consumption standards must submit to the agencies a joint agreement as specified in 49 CFR 534.8(a);

(2) Have certificate holders sell or ship vehicles that are missing certain emission-related components to be installed by secondary vehicle manufacturers;

(3) Ship partially complete vehicles to secondary manufacturers;

(4) Build electric vehicles; and

(5) Build alternative fueled vehicles from all types of heavy-duty engine conversions. The conversion manufacturer must:

(i) Install alternative fuel conversion systems into vehicles acquired from vehicle manufacturers prior to first retail sale or prior to the vehicle's introduction into interstate commerce.

(ii) Be designated by the vehicle manufacturer and EPA to be the certificate holder.

(iii) Omit alternative fueled vehicles from compliance with vehicle fuel consumption standards, if—

(A) Excluded from EPA emissions standards; and

(B) A reasonable technical basis exist that the modified vehicle continues to meet emissions and fuel consumption vehicle standards.

(c) Vehicle and engine manufacturers that must comply with this part include manufacturers required to have approved certificates of conformity from EPA as specified in 40 CFR parts 86, 1036, and 1037.

(d) The following heavy-duty vehicles and engines are excluded from the requirements of this part:

(1) Vehicles and engines manufactured prior to January 1, 2014, unless certified early under NHTSA's voluntary provisions in § 535.5.

(2) Medium-duty passenger vehicles and other vehicles subject to the light-duty corporate average fuel economy standards in 49 CFR parts 531 and 533.

(3) Recreational vehicles, including motor homes manufactured before January 1, 2021, except those produced by manufacturers voluntarily complying with NHTSA's early vocational standards for model years 2013 through 2020.

(4) Aircraft vehicles meeting the definition of "motor vehicle". For example, this would include certain convertible aircraft that can be adjusted to operate on public roads.

(5) Engines installed in heavy-duty vehicles that are not used to propel vehicles. Note, this includes engines used to indirectly propel vehicles (such as electrical generator engines that power to batteries for propulsion).

(6) The provisions of this part do not apply to engines that are not internal combustion engines. For example, the provisions of this part do not apply to fuel cells. Note that gas turbine engines are internal combustion engines.

(e) The following heavy-duty vehicles and engines are exempted from the requirements of this part:

(1) Off-road vehicles. Vehicle manufacturers producing vehicles intended for off-road may exempt vehicles without requesting approval from the agencies subject to the criteria in § 535.5(b)(9)(i) and 40 CFR 1037.631(a). If unusual circumstances exist and a manufacturer is uncertain as to whether its vehicles qualify, the manufacturer should ask for a preliminary determination from the agencies before submitting its application for certification in accordance with 40 CFR 1037.205 for the applicable vehicles. Send the request with supporting information to EPA and the agencies will coordinate in making a preliminary determination as specified in 40 CFR 1037.210. These decisions are considered to be

preliminary approvals and subject to final review and approval.

(i) Vocational vehicles with a date of manufacture before January 1, 2021 automatically qualify for an exemption under § 1037.631 if the tires installed on the vehicle have a maximum speed rating at or below 55 miles per hour.

(ii) In unusual circumstances, vehicle manufacturers may ask EPA and NHTSA to exempt vehicles under § 1037.631 based on other criteria that are equivalent to those specified in § 1037.631(a); however, the agencies will normally not grant relief in cases where the vehicle manufacturer has credits or can otherwise comply with applicable standards. Manufacturers should request approval for an exemption before producing the subject vehicles. Send your request with supporting information to the Designated Compliance Officer; EPA will coordinate in making a determination under § 1037.210. If the manufacturer introduces into U.S. commerce vehicles that depend on our approval under this paragraph (h) of this section before we inform you of our approval, those vehicles violate 40 CFR 1068.101(a)(1) and 40 CFR 535.9.

(2) *Small business manufacturers.* (i) For Phase 1, small business manufacturers are exempted from the vehicle and engine standards of § 535.5, but must comply with the reporting requirements of § 535.8(g).

(ii) For Phase 2, fuel consumption standards apply on a delayed schedule for manufacturers meeting the small business criteria specified in 13 CFR 121.201 and in 40 CFR 86.1819-14(k)(5), 40 CFR 1036.150, and 40 CFR 1037.150. Qualifying manufacturers of truck tractors, vocational vehicles, heavy duty pickups and vans, and engines are not subject to the fuel consumption standards for vehicles built before January 1, 2022 and engines (such as those engines built by small alternative fuel engine converters) with a date of manufacturer on or after November 14, 2011 and before January 1, 2022. Qualifying manufacturers may choose to voluntarily comply early.

(A) Small manufacturers that certify their entire U.S.-directed production volume to the Phase 1 standards for calendar year 2021 may certify to the Phase 1 standards for model year 2022 (instead of the otherwise applicable Phase 2 standards).

(B) Phase 1 vehicle credits small manufacturers generate under provision (A) of this section for model year 2018 through 2022 vocational vehicles may be used through model year 2027 (instead of being subject to a five-year credit life).

(iii) Small business manufacturers producing vehicles and engines that run on any fuel other than gasoline, E85, or diesel fuel meeting the criteria specified in 13 CFR 121.201 and in 40 CFR 86.1819–14(k)(5), 40 CFR 1036.150, and 40 CFR 1037.150 may delay complying with every new mandatory standard under this part by one model year.

(3) Engines for specialty vehicles. Engines certified to the alternative standards specified in 40 CFR 86.007–11 and 86.008–10 for use in specialty vehicles as described in 40 CFR 1037.605. Compliance with the vehicle provisions in 40 CFR 1037.605 satisfies compliance for NHTSA under this part.

(f) For model year 2021 and later, vocational vehicle manufacturers building custom chassis vehicles (e.g., emergency vehicles) may be exempted from standards in § 535.5(b)(4) and may comply with alternative fuel consumption standards as specified in § 535.5(b)(6). Manufacturers complying with alternative fuel consumption standards in § 535.5(b)(6) are restricted in using fuel consumption credits as specified in § 535.7(c).

(g) The fuel consumption standards in some cases apply differently for spark-ignition and compression-ignition engines or vehicles as specified in 40 CFR parts 1036 and 1037. Engine requirements are similarly differentiated by engine type and by primary intended service class, as described in 40 CFR 1036.140.

(h) NHTSA may exclude or exempt vehicles and engines under special conditions allowed by EPA in accordance with 40 CFR parts 85, 86, 1036, 1037, 1039, and 1068. Manufacturers should consult the agencies if uncertain how to apply any EPA provision under the NHTSA fuel consumption program. It is recommended that manufacturers seek clarification before producing a vehicle. Upon notification by EPA of a fraudulent use of an exemption, NHTSA reserves that right to suspend or revoke any exemption or exclusion.

(i) In cases where there are differences between the application of this part and the corresponding EPA program regarding whether a vehicle is regulated or not (such as due to differences in applicability resulting from differing agency definitions, etc.), manufacturers should contact the agencies to identify these vehicles and assess the applicability of the agencies' standards. The agencies will provide guidance on how the vehicles can comply. Manufacturers are required to identify these vehicles in their final reports submitted in accordance with § 535.8.

(j) If EPA denies, suspends or revokes, a manufacturer's certificate of conformity in accordance with 40 CFR 1036.255 or 1037.225, due to incomplete, incorrect or fraudulent information, the vehicles or engines covered by the applicable certificate will be:

(1) ineligible to participate in the NHTSA fuel consumption program if the certificate is denied.

(2) eligible only for partial crediting under § 535.7, for the population of vehicles or engines which the certificate remains in effect before the date of the suspension. The population of vehicle or engines after the suspension may also be subject to possible fines in accordance with § 535.9.

(3) ineligible for crediting under § 535.7, and subject to possible fines in accordance with § 535.9 if fraud exists.

(4) If NHTSA finds a manufacturer has submitted incomplete, incorrect or fraudulent information, it will contact EPA to deliberate and determine the appropriate enforcement action.

#### § 535.4 Definitions.

The terms manufacture and manufacturer are used as defined in section 501 of the Act and the terms commercial medium-duty and heavy-duty on highway vehicle, fuel and work truck are used as defined in 49 U.S.C. 32901. See 49 CFR 523.2 for general definitions related to NHTSA's fuel efficiency programs.

*Act* means the Motor Vehicle Information and Cost Savings Act, as amended by Public Law 94–163 and 96–425.

*Adjustable parameter* has the meaning given in 40 CFR 1037.801.

*Administrator* means the Administrator of the National Highway Traffic Safety Administration (NHTSA) or the Administrator's delegate.

*Advanced technology* means vehicle technology under this fuel consumption program in § 535.6 and 535.7 and by EPA under 40 CFR 86.1819–14(d)(7), 1036.615, or 1037.615.

*Alterers* means a manufacturer that modifies an altered vehicle as defined in 49 CFR 567.3.

*Alternative fuel conversion* has the meaning given for clean alternative fuel conversion in 40 CFR 85.502.

*Alternative fuel conversion* has the meaning given in 40 CFR 85.502.

*A to B testing* has the meaning given in 40 CFR 1037.801.

*Automated manual transmission* has the meaning given in 40 CFR 1037.801.

*Automatic tire inflation system* has the meaning given in 40 CFR 1037.801.

*Automatic transmission (AT)* has the meaning given in 40 CFR 1037.801.

*Auxiliary power unit* has the meaning given in 40 CFR 1037.801.

*Averaging set* means, a set of engines or vehicles in which fuel consumption credits may be exchanged. Credits generated by one engine or vehicle family may only be used by other respective engine or vehicle families in the same averaging set as specified in § 535.7. Note that an averaging set may comprise more than one regulatory subcategory. The averaging sets for this HD program are defined as follows:

(1) Heavy-duty pickup trucks and vans.

(2) Light heavy-duty (LHD) vehicles.

(3) Medium heavy-duty (MHD) vehicles.

(4) Heavy heavy-duty (HHD) vehicles.

(5) Light heavy-duty engines subject to compression-ignition standards.

(6) Medium heavy-duty engines subject to compression-ignition standards.

(7) Heavy heavy-duty engines subject to compression-ignition standards.

(8) Engines subject to spark-ignition standards.

(9) Vehicle types certifying to optional custom chassis standards as specified in § 535.5(b)(6) form separate averaging sets for each vehicle type as specified in § 535.7(c).

*Axle ratio or Drive axle ratio, ka* has the meaning given in 40 CFR 1037.801.

*Basic vehicle frontal area* has the meaning given in 40 CFR 1037.801.

*Cab-complete vehicle* has the meaning given in 49 CFR 523.2.

*Carryover* has the meaning given in 40 CFR 1037.801.

*Certificate holder* means the manufacturer who holds the certificate of conformity for the vehicle or engine and that assigns the model year based on the date when its manufacturing operations are completed relative to its annual model year period.

*Certificate of Conformity* means an approval document granted by EPA to a manufacturer that submits an application for a vehicle or engine emissions family in 40 CFR 1036.205 and 1037.205. A certificate of conformity is valid from the indicated effective date until December 31 of the model year for which it is issued. The certificate must be renewed annually for any vehicle a manufacturer continues to produce. Information included in an amended application made in accordance with 40 CFR part 1036.225 and 1037.225, before the end of the model year applies similarly to the NHTSA fuel consumption program as to the EPA. If a manufacturer amends its application to make the amended application correct and complete, these changes do not apply retroactively to

the NHTSA fuel efficiency program. Also, if EPA or NHTSA determines that the manufacturer's amended application is not correct and complete, or otherwise does not conform to its regulations, any changes finalized by EPA or if EPA suspends, revokes, or voids a certification, also applies to the NHTSA fuel efficiency program. See § 535.3(j).

*Certification* has the meaning given in 40 CFR 1037.801.

*Certified emission level* has the meaning given in 40 CFR 1036.801.

*Chassis-cab* means the incomplete part of a vehicle that includes a frame, a completed occupant compartment and that requires only the addition of cargo-carrying, work-performing, or load-bearing components to perform its intended functions.

*Chief Counsel* means the NHTSA Chief Counsel, or his or her designee.

*Class* means relating to GVWR classes for vehicles other than trailers, as follows:

(1) *Class 2b vehicles* are vehicles with a gross vehicle weight rating (GVWR) ranging from 8,501 to 10,000 pounds.

(2) *Class 3 through Class 8 vehicles* are vehicles with a gross vehicle weight rating (GVWR) of 10,001 pounds or more as defined in 49 CFR 565.15.

*Complete sister vehicle* is a complete vehicle of the same configuration as a cab-complete vehicle.

*Complete vehicle* has the meaning given in 49 CFR part 523.

*Compression-ignition (CI)* means relating to a type of reciprocating, internal-combustion engine, such as a diesel engine, that is not a spark-ignition engine. Note, in accordance with 40 CFR 1036.1, gas turbine engines and other engines not meeting the definition of compression-ignition are deemed to be compression-ignition engines for complying with fuel consumption standards.

*Configuration* means a subclassification within a test group for passenger cars, light trucks and medium-duty passenger vehicles and heavy-duty pickup trucks and vans which is based on basic engine, engine code, transmission type and gear ratios, and final drive ratio.

*Container chassis trailer* has the same meaning as container chassis in 40 CFR 1037.801.

*Curb weight* has the meaning given in 40 CFR 86.1803.

*Custom chassis vehicle* means a vocational vehicle that is a motor home, school bus, refuse hauler, concrete mixer, emergency vehicle, mixed-use vehicle or other buses that are not school buses or motor coaches. These vehicle types are defined in 49 CFR

523.3. A "mixed-use vehicle" is one that meets at least one of the criteria specified in 40 CFR 1037.631(a)(1) or at least one of the criteria in 40 CFR 1037.631(a)(2), but not both.

*Date of manufacture* means the date on which the certifying vehicle manufacturer completes its manufacturing operations, except as follows:

(1) Where the certificate holder is an engine manufacturer that does not manufacture the complete or incomplete vehicle, the date of manufacture of the vehicle is based on the date assembly of the vehicle is completed.

(2) EPA and NHTSA may approve an alternate date of manufacture based on the date on which the certifying (or primary) vehicle manufacturer completes assembly at the place of main assembly, consistent with the provisions of 40 CFR 1037.601 and 49 CFR 567.4.

(3) A vehicle manufacturer that completes assembly of a vehicle at two or more facilities may ask to use as the month and year of manufacture, for that vehicle, the month and year in which manufacturing is completed at the place of main assembly, consistent with provisions of 49 CFR 567.4, as the model year. Note that such staged assembly is subject to the provisions of 40 CFR 1068.260(c). NHTSA's allowance of this provision is effective when EPA approves the manufacturer's certificates of conformity for these vehicles.

*Day cab* has the meaning given in 40 CFR 1037.801.

*Drayage tractor* has the meaning given in 40 CFR 1037.801.

*Dual-clutch transmission (DCT)* means a transmission has the meaning given in 40 CFR 1037.801.

*Dual-fuel* has the meaning given in 40 CFR 1037.801.

*Electric vehicle* has the meaning given in 40 CFR 1037.801.

*Emergency vehicle* means a vehicle that meets one of the criteria in 40 CFR 1037.801.

*Emission data engine* has the meaning given in 40 CFR 1036.801.

*Engine configuration* has the meaning given in 40 CFR 1036.801.

*Engine family* has the meaning given in 40 CFR 1036.230. Manufacturers designate families in accordance with EPA provisions and may not choose different families between the NHTSA and EPA programs.

*Excluded* means a vehicle or engine manufacturer or component is not required to comply with any aspects with the NHTSA fuel consumption program.

*Exempted* means a vehicle or engine manufacturer or component is not

required to comply with certain provisions of the NHTSA fuel consumption program.

*Family certification level (FCL)* has the meaning given in 40 CFR 1036.801.

*Family emission limit (FEL)* has the meaning given in 40 CFR 1037.801.

*Final drive ratio* has the meaning given in 40 CFR 1037.801.

*Final-stage manufacturer* has the meaning given in 49 CFR 567.3 and includes secondary vehicle manufacturers as defined in 40 CFR 1037.801.

*Fleet* in this part means all the heavy-duty vehicles or engines within each of the regulatory sub-categories that are manufactured by a manufacturer in a particular model year and that are subject to fuel consumption standards under § 535.5.

*Fleet average fuel consumption* is the calculated average fuel consumption performance value for a manufacturer's fleet derived from the production weighted fuel consumption values of the unique vehicle configurations within each vehicle model type that makes up that manufacturer's vehicle fleet in a given model year. In this part, the fleet average fuel consumption value is determined for each manufacturer's fleet of heavy-duty pickup trucks and vans.

*Fleet average fuel consumption standard* is the actual average fuel consumption standard for a manufacturer's fleet derived from the production weighted fuel consumption standards of each unique vehicle configuration, based on payload, tow capacity and drive configuration (2, 4 or all-wheel drive), of the model types that makes up that manufacturer's vehicle fleet in a given model year. In this part, the fleet average fuel consumption standard is determined for each manufacturer's fleet of heavy-duty pickup trucks and vans.

*Flexible-fuel* has the meaning given in 40 CFR 1036.801.

*Fuel cell* means an electrochemical cell that produces electricity via the non-combustion reaction of a consumable fuel, typically hydrogen.

*Fuel cell electric vehicle* means a motor vehicle propelled solely by an electric motor where energy for the motor is supplied by a fuel cell.

*Fuel efficiency* means the amount of work performed for each gallon of fuel consumed.

*Fuel type* has the meaning given in 40 CFR 1037.801.

*Gaseous fuel* has the meaning given in 40 CFR 1037.801.

*Gear ratio or Transmission gear ratio*, kg, has the meaning given in 40 CFR 1037.801.

*Good engineering judgment* has the meaning given in 40 CFR 1068.30. See 40 CFR 1068.5 for the administrative process used to evaluate good engineering judgement.

*Greenhouse gas* has the meaning given in 40 CFR 1036.801.

*Greenhouse gas Emissions Model (GEM)* has the meaning given in 40 CFR 1037.801.

*Gross axle weight rating (GAWR)* has the meaning given in 49 CFR 571.3.

*Gross combination weight rating (GCWR)* has the meaning given in 49 CFR 571.3.

*Gross vehicle weight rating (GVWR)* has the meaning given in 49 CFR 571.3.

*Heavy-duty off-road vehicle* means a heavy-duty vocational vehicle or vocational tractor that is intended for off-road use.

*Heavy-duty engine* has the meaning given in 40 CFR 1036.801 and 49 CFR part 523.

*Heavy-duty vehicle* has the meaning given in 40 CFR 1036.801 and 49 CFR part 523.

*Heavy-haul tractor* has the meaning given in 40 CFR 1037.801 and 49 CFR part 523.

*Heavy heavy-duty (HHD) vehicle* has the meaning given in vehicle service class.

*Hybrid* has the meaning given in 40 CFR 1036.801.

*Hybrid engine or hybrid powertrain* has the meaning given in 40 CFR 1037.801.

*Hybrid vehicle* has the meaning given in 40 CFR 1037.801.

*Identification number* has the meaning given in 40 CFR 1037.801.

*Idle operation* has the meaning given in 40 CFR 1037.801.

*Incomplete vehicle* has the meaning given in 49 CFR part 523. For the purpose of this regulation, a manufacturer may request EPA and NHTSA to allow the certification of a vehicle as an incomplete vehicle if it manufactures the engine and sells the unassembled chassis components, provided it does not produce and sell the body components necessary to complete the vehicle.

*Innovative technology* means technology certified under § 535.7 and by EPA under 40 CFR 86.1819–14(d)(13), 1036.610, and 1037.610 in the Phase 1 program.

*Intermediate manufacturer* has the meaning given in 49 CFR 567.3.

*Light heavy-duty (LHD) vehicle* has the meaning given in vehicle service class.

*Liquefied petroleum gas (LPG)* has the meaning given in 40 CFR 1036.801.

*Low rolling resistance tire* means a tire on a vocational vehicle with a tire

rolling resistance level (TRRL) of 7.7 kg/metric ton or lower, a steer tire on a tractor with a TRRL of 7.7 kg/metric ton or lower, or a drive tire on a tractor with a TRRL of 8.1 kg/metric ton or lower.

*Manual transmission (MT)* has the meaning given in 40 CFR 1037.801.

*Manufacturer* has the meaning given in 40 CFR 1036.801.

*Medium heavy-duty (MHD) vehicle* has the meaning given in vehicle service class.

*Model type* has the meaning given in 40 CFR 600.002.

*Model year* as it applies to vehicles means:

(1) For tractors and vocational vehicles with a date of manufacture on or after January 1, 2021, the vehicle's *model year* is the calendar year corresponding to the date of manufacture; however, the vehicle's model year may be designated to be the year before the calendar year corresponding to the date of manufacture if the engine's model year is also from an earlier year. Note that paragraph (2) of this definition limits the extent to which vehicle manufacturers may install engines built in earlier calendar years. Note that 40 CFR 1037.601(a)(2) limits the extent to which vehicle manufacturers may install engines built in earlier calendar years.

(2) For Phase 1 tractors and vocational vehicles with a date of manufacture before January 1, 2021, *model year* means the manufacturer's annual new model production period, except as restricted under this definition. It must include January 1 of the calendar year for which the model year is named, may not begin before January 2 of the previous calendar year, and it must end by December 31 of the named calendar year. The model year may be set to match the calendar year corresponding to the date of manufacture.

(i) The manufacturer who holds the certificate of conformity for the vehicle must assign the model year based on the date when its manufacturing operations are completed relative to its annual model year period. In unusual circumstances where completion of your assembly is delayed, we may allow you to assign a model year one year earlier, provided it does not affect which regulatory requirements will apply.

(ii) Unless a vehicle is being shipped to a secondary manufacturer that will hold the certificate of conformity, the model year must be assigned prior to introduction of the vehicle into U.S. commerce. The certifying manufacturer must re-designate the model year if it does not complete its manufacturing

operations within the originally identified model year. A vehicle introduced into U.S. commerce without a model year is deemed to have a model year equal to the calendar year of its introduction into U.S. commerce unless the certifying manufacturer assigns a later date.

*Model year* as it applies to engines means the manufacturer's annual new model production period, except as restricted under this definition. It must include January 1 of the calendar year for which the model year is named, may not begin before January 2 of the previous calendar year, and it must end by December 31 of the named calendar year. Manufacturers may not adjust model years to circumvent or delay compliance with emission standards or to avoid the obligation to certify annually.

(1) The following provisions apply for production and ABT reports during the transition to engine-based model year determinations for tractors and vocational vehicles in 2020 and 2021:

(i) If a manufacturer installs model year 2020 or earlier engines in its vehicles in calendar year 2020, the manufacturers should include all those Phase 1 vehicles in its production and ABT reports related to model year 2020 compliance, although EPA may require the manufacturer to identify these separately from vehicles produced in calendar year 2019.

(ii) If a manufacturer installs model year 2020 engines in its vehicles in calendar year 2021, the manufacturer should submit production and ABT reports for those Phase 1 vehicles separate from the reports it submits for Phase 2 vehicles with model year 2021 engines.

*Motor Vehicle* has the meaning given in 49 U.S.C. 32901.

*Multi-purpose* has the meaning given in 40 CFR 1037.801.

*Natural gas* has the meaning given in 40 CFR 1036.801. Vehicles that use a pilot-ignited natural gas engine (which uses a small diesel fuel ignition system), are still considered natural gas vehicles.

*NHTSA Enforcement* means the NHTSA Associate Administrator for Enforcement, or his or her designee.

*Neutral coasting* has the meaning given in 40 CFR 1037.801.

*Neutral idle* has the meaning given in 40 CFR 1037.801.

*New vehicles* has the meaning given to "new motor vehicle" provided in 40 CFR 1037.801.

*Off-cycle technology* means technology certified under § 535.7 and by EPA under 40 CFR 86.1819–14(d)(13), 1036.610, and 1037.610 in the Phase 2 program.

*Party* means the person alleged to have committed a violation of § 535.9, and includes manufacturers of vehicles and manufacturers of engines.

*Payload* means in this part the resultant of subtracting the curb weight from the gross vehicle weight rating.

*Percent* has the meaning given in 40 CFR 1036.801.

*Petroleum* has the meaning given in 40 CFR 1037.801.

*Phase 1* means the joint NHTSA and EPA program established in 2011 for fuel efficiency standards and greenhouse gas emissions standards regulating medium- and heavy-duty engines and vehicles. See § 535.5 for the specific model years that standards apply to vehicles and engines.

*Phase 2* means the joint NHTSA and EPA program established in 2016 for fuel efficiency standards and greenhouse gas emissions standards regulating medium- and heavy-duty vehicles and engines. See § 535.5 for the specific model years that standards apply to vehicles and engines.

*Pickup truck* has the meaning given in 49 CFR part 523.

*Placed into service* has the meaning given in 40 CFR 1037.801.

*Plug-in hybrid electric vehicle (PHEV)* means a hybrid electric vehicle that has the capability to charge the battery or batteries used for vehicle propulsion from an off-vehicle electric source, such that the off-vehicle source cannot be connected to the vehicle while the vehicle is in motion.

*Power take-off (PTO)* means a secondary engine shaft or other system on a vehicle that provides substantial auxiliary power for purposes unrelated to vehicle propulsion or normal vehicle accessories such as air conditioning, power steering, and basic electrical accessories. A typical PTO uses a secondary shaft on the engine to transmit power to a hydraulic pump that powers auxiliary equipment such as a boom on a bucket truck.

*Powertrain family* has the meaning given in 40 CFR 1037.231.

Manufacturers choosing to perform powertrain testing as specified in 40 CFR 1037.550, divide product lines into powertrain families that are expected to have similar fuel consumptions and CO<sub>2</sub> emission characteristics throughout the useful life.

*Preliminary approval* means approval granted by an authorized EPA representative prior to submission of an application for certification, consistent with the provisions of 40 CFR 1037.210. For requirements involving NHTSA, EPA will ensure decisions are jointly

made and will convey the decision to the manufacturer.

*Primary intended service class* has the same meaning for engines as specified in 40 CFR 1036.140. Manufacturers must identify a single primary intended service class for each engine family that best describes vehicles for which it designs and markets the engine, as follows:

(1) Divide compression-ignition engines into primary intended service classes based on the following engine and vehicle characteristics:

(i) Light heavy-duty “LHD” engines usually are not designed for rebuild and do not have cylinder liners. Vehicle body types in this group might include any heavy-duty vehicle built from a light-duty truck chassis, van trucks, multi-stop vans, and some straight trucks with a single rear axle. Typical applications would include personal transportation, light-load commercial delivery, passenger service, agriculture, and construction. The GVWR of these vehicles is normally below 19,500 pounds.

(ii) Medium heavy-duty “MHD” engines may be designed for rebuild and may have cylinder liners. Vehicle body types in this group would typically include school buses, straight trucks with single rear axles, city tractors, and a variety of special purpose vehicles such as small dump trucks, and refuse trucks. Typical applications would include commercial short haul and intra-city delivery and pickup. Engines in this group are normally used in vehicles whose GVWR ranges from 19,500 to 33,000 pounds.

(iii) Heavy heavy-duty “HHD” engines are designed for multiple rebuilds and have cylinder liners. Vehicles in this group are normally tractors, trucks, straight trucks with dual rear axles, and buses used in inter-city, long-haul applications. These vehicles normally exceed 33,000 pounds GVWR.

(2) Divide spark-ignition engines into primary intended service classes as follows:

(i) Spark-ignition engines that are best characterized by paragraph (1)(i) or (ii) of this section are in a separate “spark-ignition” primary intended service class.

(ii) Spark-ignition engines that are best characterized by paragraph (1)(iii) of this section share a primary intended service class with compression-ignition heavy heavy-duty engines. Gasoline-fueled engines are presumed not to be characterized by paragraph (1)(iii) of this section; for example, vehicle manufacturers may install some number

of gasoline-fueled engines in Class 8 trucks without causing the engine manufacturer to consider those to be heavy heavy-duty engines.

(iii) References to “spark-ignition standards” in this part relate only to the spark-ignition engines identified in paragraph (b)(1) of this section. References to “compression-ignition standards” in this part relate to compression-ignition engines, to spark-ignition engines optionally certified to standards that apply to compression-ignition engines, and to all engines identified under paragraph (b)(2) of this section as heavy heavy-duty engines.

*Rechargeable Energy Storage System (RESS)* means the component(s) of a hybrid engine or vehicle that store recovered energy for later use, such as the battery system in a electric hybrid vehicle.

*Refuse hauler* has the meaning given in 40 CFR 1037.801.

*Regional* has the meaning relating to the Regional duty cycle as specified in 40 CFR 1037.510.

*Regulatory category* means each of the four types of heavy-duty vehicles defined in 49 CFR 523.6 and the heavy-duty engines used in these heavy-duty vehicles.

*Regulatory subcategory* means the sub-groups in each regulatory category to which mandatory fuel consumption standards and requirements apply as specified in 40 CFR 1036.230 and 1037.230 and are defined as follows:

(1) Heavy-duty pick-up trucks and vans.

(2) Vocational vehicle subcategories have 18 separate vehicle service classes as shown in Tables 1 and 2 below and include vocational tractors. Table 1 includes vehicles complying with Phase 1 standards. Phase 2 vehicles are included in Table 2 which have separate subcategories to account for engine characteristics, GVWR, and the selection of duty cycle for vocational vehicles as specified in 40 CFR 1037.510; vehicles may additionally fall into one of the subcategories defined by the custom-chassis standards in § 535.5(b)(6) and 40 CFR 1037.105(h). Manufacturers using the alternate standards in § 535.5(b)(6) and 40 CFR 1037.105(h) should treat each vehicle type as a separate vehicle subcategory.

TABLE 1—PHASE 1 VOCATIONAL VEHICLE SUBCATEGORIES

Vocational LHD vehicles.  
Vocational MHD vehicles.  
Vocational HHD vehicles.

TABLE 2—PHASE 2 VOCATIONAL VEHICLE SUBCATEGORIES

Engine type	Vocational LHD vehicles	Vocational MHD vehicles	Vocational HHD vehicles
CI .....	Urban .....	Urban .....	Urban.
CI .....	Multi-Purpose .....	Multi-Purpose .....	Multi-Purpose.
CI .....	Regional .....	Regional .....	Regional.
SI .....	Urban .....	Urban.	
SI .....	Multi-Purpose .....	Multi-Purpose.	
SI .....	Regional .....	Regional.	

(3) Tractor subcategories are shown in Table 3 below for Phase 1 and 2. Table 3 includes 10 separate subcategories for tractors complying with Phase 1 and 2 standards. The heavy-haul tractor subcategory only applies for Phase 2.

TABLE 3—PHASE 1 AND 2 TRUCK TRACTOR SUBCATEGORIES

Class 7	Class 8 day cabs	Class 8 sleeper cabs
Low-roof tractors .....	Low-roof day cab tractors .....	Low-roof sleeper cab tractors.
Mid-roof tractors .....	Mid-roof day cab tractors .....	Mid-roof sleeper cab tractors.
High-roof tractors .....	High-roof day cab tractors .....	High-roof sleeper cab tractors.
Heavy-haul tractors (applies only to Phase 2 program).		

(5) Engine subcategories are shown for each primary intended service class in Table 5 below. Table 5 includes 6 separate subcategories for engines which are the same for Phase 1 and 2 standards.

TABLE 5—ENGINE SUBCATEGORIES

LHD engines	MHD engines	HHD engines
CI engines for vocational vehicles .....	CI engines for vocational vehicles .....	CI engines for vocational vehicles.
	CI engines for truck tractors .....	CI engines for truck tractors.
All spark-ignition engines.		

*Relating to* has the meaning given in 40 CFR 1037.801.

*Revoke* has the same meaning given in 40 CFR 1068.30.

*Roof height* means the maximum height of a vehicle (rounded to the nearest inch), excluding narrow accessories such as exhaust pipes and antennas, but including any wide accessories such as roof fairings. Measure roof height of the vehicle configured to have its maximum height that will occur during actual use, with properly inflated tires and no driver, passengers, or cargo onboard. Determine the base roof height on fully inflated tires having a static loaded radius equal to the arithmetic mean of the largest and smallest static loaded radius of tires a manufacturer offers or a standard tire EPA approves. If a vehicle is equipped with an adjustable roof fairing, measure the roof height with the fairing in its lowest setting. Once the maximum height is determined, roof heights are divided into the following categories:

- (1) Low-roof means a vehicle with a roof height of 120 inches or less.
- (2) Mid-roof means a vehicle with a roof height between 121 and 147 inches.

(3) High-roof means a vehicle with a roof height of 148 inches or more.

*Round* has the meaning given in 40 CFR 1065.1001.

*Secondary vehicle manufacturer* has the same meaning as final-stage manufacturer in 49 CFR part 567.

*Service class group* means a group of engine and vehicle averaging sets defined as follows:

- (1) Spark-ignition engines, light heavy-duty compression-ignition engines, light heavy-duty vocational vehicles and heavy-duty pickup trucks and vans.
- (2) Medium heavy-duty compression-ignition engines and medium heavy-duty vocational vehicles and tractors.
- (3) Heavy heavy-duty compression-ignition engines and heavy heavy-duty vocational vehicles and tractors.

*Sleeper cab* means a type of truck cab that has a compartment behind the driver's seat intended to be used by the driver for sleeping. This includes both cabs accessible from the driver's compartment and those accessible from outside the vehicle.

*Small business manufacturer* means a manufacturer meeting the criteria specified in 13 CFR 121.201. For

manufacturers owned by a parent company, the employee and revenue limits apply to the total number of employees and total revenue of the parent company and all its subsidiaries.

*Spark-ignition (SI)* means relating to a gasoline-fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation. Note that some spark-ignition engines are subject to requirements that apply for compression-ignition engines as described in 40 CFR 1036.140.

*Standard payload* means the payload assumed for each vehicle, in tons, for modeling and calculating emission credits, as follows:

- (1) For vocational vehicles:
  - (i) 2.85 tons for light heavy-duty vehicles.
  - (ii) 5.6 tons for medium heavy-duty vehicles.
  - (iii) 7.5 tons for heavy heavy-duty vocational vehicles.
- (2) For tractors:
  - (i) 12.5 tons for Class 7.

(ii) 19 tons for Class 8.

(iii) 43 tons for heavy-haul tractors.

*Standard tractor* has the meaning given in 40 CFR 1037.801.

*Standard trailer* has the meaning given in 40 CFR 1037.801.

*Stop start* has the meaning given in 40 CFR 1037.801

*Subconfiguration* means a unique combination within a vehicle configuration of equivalent test weight, road-load horsepower, and any other operational characteristics or parameters that EPA determines may significantly affect CO<sub>2</sub> emissions within a vehicle configuration as defined in 40 CFR 600.002.

*Suspend* has the meaning given in 40 CFR 1037.801.

*Tank trailer* has the meaning given in 40 CFR 1037.801.

*Test group* means the multiple vehicle lines and model types that share critical emissions and fuel consumption related features and that are certified as a group by a common certificate of conformity issued by EPA and is used collectively with other test groups within an averaging set or regulatory subcategory and is used by NHTSA for determining the fleet average fuel consumption.

*The agencies* means the National Highway Traffic Safety Administration (NHTSA) and the Environmental Protection Agency (EPA) in this part.

*Tire pressure monitoring system (TPMS)* has the meaning given in section S3 of 49 CFR 571.138.

*Tire rolling resistance level (TRRL)* means a value with units of kg/metric ton that represents that rolling resistance of a tire configuration. TRRLs are used as inputs to the GEM model under 40 CFR 1037.520. Note that a manufacturer may assign a value higher than a measured rolling resistance of a tire configuration.

*Towing capacity* in this part is equal to the resultant of subtracting the gross vehicle weight rating from the gross combined weight rating.

*Trade* means to exchange fuel consumption credits, either as a buyer or a seller.

*U.S.-directed production volume* means the number of vehicle units, subject to the requirements of this part, produced by a manufacturer for which the manufacturer has a reasonable assurance that sale was or will be made to ultimate purchasers in the United States.

*Useful life* has the meaning given in 40 CFR 1036.801 and 1037.801.

*Vehicle configuration* means a unique combination of vehicle hardware and calibration (related to measured or modeled emissions) within a vehicle family as specified in 40 CFR 1037.801.

Vehicles with hardware or software differences, but that have no hardware or software differences related to measured or modeled emissions or fuel consumption can be included in the same vehicle configuration. Note that vehicles with hardware or software differences related to measured or modeled emissions or fuel consumption are considered to be different configurations even if they have the same GEM inputs and FEL. Vehicles within a vehicle configuration differ only with respect to normal production variability or factors unrelated to measured or modeled emissions and fuel consumption for EPA and NHTSA.

*Vehicle family* has the meaning given in 40 CFR 1037.230. Manufacturers designate families in accordance with EPA provisions and may not choose different families between the NHTSA and EPA programs. If a manufacturer is certifying vehicles within a vehicle family to more than one FEL, it must subdivide its greenhouse gas and fuel consumption vehicle families into subfamilies that include vehicles with identical FELs. Note that a manufacturer may add subfamilies at any time during the model year.

*Vehicle service class* has the same meaning for vehicles as specified in 40 CFR 1037.140.

*Vehicle subfamily or subfamily* means a subset of a vehicle family including vehicles subject to the same FEL(s).

*Vocational tractor* has the meaning given in 40 CFR 1037.801.

*Void* has the meaning given in 40 CFR 1036.30.

*Zero emissions vehicle* means an electric vehicle or a fuel cell vehicle.

#### § 535.5 Standards.

(a) *Heavy-duty pickup trucks and vans.* Each manufacturer's fleet of heavy-duty pickup trucks and vans shall comply with the fuel consumption standards in this paragraph (a) expressed in gallons per 100 miles. Each vehicle must be manufactured to comply for its full useful life. For the Phase 1 program, if the manufacturer's fleet includes conventional vehicles (gasoline, diesel and alternative fueled vehicles) and advanced technology vehicles (hybrids with powertrain designs that include energy storage systems, vehicles with waste heat recovery, electric vehicles and fuel cell vehicles), it may divide its fleet into two separate fleets each with its own separate fleet average fuel consumption standard which the manufacturer must comply with the requirements of this paragraph (a). For Phase 2, manufacturers may calculate their fleet average fuel consumption standard for a

conventional fleet and multiple advanced technology vehicle fleets. Advanced technology vehicle fleets should be separated into plug-in hybrid electric vehicles, electric vehicles and fuel cell vehicles. The standards in this paragraph (a) correspond to the same requirements for EPA as specified in 40 CFR 86.1819–14. Manufacturers must apply the fuel consumption standards in this paragraph (a) to the same vehicles and engines using the same options used to comply with EPA in 40 CFR part 86, subpart S. Engines that comply to the standards in this paragraph are not allowed to comply with the standards in paragraph (d) of this section.

(1) *Mandatory standards.* For model years 2016 and later, each manufacturer must comply with the fleet average standard derived from the unique subconfiguration target standards (or groups of subconfigurations approved by EPA in accordance with 40 CFR 86.1819) of the model types that make up the manufacturer's fleet in a given model year. Each subconfiguration has a unique attribute-based target standard, defined by each group of vehicles having the same payload, towing capacity and whether the vehicles are equipped with a 2-wheel or 4-wheel drive configuration. Phase 1 target standards apply for model years 2016 through 2020. Phase 2 target standards apply for model year 2021 and afterwards.

(2) *Subconfiguration target standards.*

(i) Two alternatives exist for determining the subconfiguration target standards for Phase 1. For each alternative, separate standards exist for compression-ignition and spark-ignition vehicles:

(A) The first alternative allows manufacturers to determine a fixed fuel consumption standard that is constant over the model years; and

(B) The second alternative allows manufacturers to determine standards that are phased-in gradually each year.

(ii) Calculate the subconfiguration target standards as specified in this paragraph (a)(2)(ii) of this section, using the appropriate coefficients from Table 6 choosing between the alternatives in paragraph (a)(2)(i) of this section. For electric or fuel cell heavy-duty vehicles, use compression-ignition vehicle coefficients "c" and "d" and for hybrid (including plug-in hybrid), dedicated and dual-fueled vehicles, use coefficients "c" and "d" appropriate for the engine type used. Round each standard to the nearest 0.001 gallons per 100 miles and specify all weights in pounds rounded to the nearest pound. Calculate the subconfiguration target standards using the following equation:



Subconfiguration Target Standard  
(gallons per 100 miles) = [c × (WF)]  
+ d

Where:

WF = Work Factor = [0.75 × (Payload Capacity + Xwd)] + [0.25 × Towing Capacity]  
Xwd = 4wd Adjustment = 500 lbs if the vehicle group is equipped with 4wd and all-wheel drive, otherwise equals 0 lbs for 2wd.

Payload Capacity = GVWR (lbs) – Curb Weight (lbs) (for each vehicle group)  
Towing Capacity = GCWR (lbs) – GVWR (lbs) (for each vehicle group)

TABLE 6—COEFFICIENTS FOR MANDATORY SUBCONFIGURATION TARGET STANDARDS

Model year(s)	c	d
<b>Phase 1 Alternative 1—Fixed Target Standards</b>		
<b>CI Vehicle Coefficients</b>		
2016 to 2018 .....	0.0004322	3.330
2019 to 2020 .....	0.0004086	3.143
<b>SI Vehicle Coefficients</b>		
2016 to 2017 .....	0.0005131	3.961
2018 to 2020 .....	0.0004086	3.143
<b>Phase 1 Alternative 2—Phased-in Target Standards</b>		
<b>CI Vehicle Coefficients</b>		
2016 .....	0.0004519	3.477
2017 .....	0.0004371	3.369
2018 to 2020 .....	0.0004086	3.143
<b>SI Vehicle Coefficients</b>		
2016 .....	0.0005277	4.073
2017 .....	0.0005176	3.983
2018 to 2020 .....	0.0004951	3.815
<b>Phase 2—Fixed Target Standards</b>		
<b>CI Vehicle Coefficients</b>		
2021 .....	0.0003988	3.065
2022 .....	0.0003880	2.986
2023 .....	0.0003792	2.917
2024 .....	0.0003694	2.839
2025 .....	0.0003605	2.770
2026 .....	0.0003507	2.701
2027 and later .....	0.0003418	2.633
<b>SI Vehicle Coefficients</b>		
2021 .....	0.0004827	3.725
2022 .....	0.0004703	3.623
2023 .....	0.0004591	3.533
2024 .....	0.0004478	3.443
2025 .....	0.0004366	3.364
2026 .....	0.0004253	3.274
2027 and later .....	0.0004152	3.196

(3) *Fleet average fuel consumption standard.* (i) For the Phase 1 program, calculate each manufacturer's fleet average fuel consumption standard for a conventional fleet and a combined advanced technology fleet separately

based on the subconfiguration target standards specified in paragraph (a)(2) of this section, weighted to production volumes and averaged using the following equation combining all the applicable vehicles in a manufacturer's

U.S.-directed fleet (compression-ignition, spark-ignition and advanced technology vehicles) for a given model year, rounded to the nearest 0.001 gallons per 100 miles:

$$Fleet\ Average\ Standard = \frac{\sum [Subconfiguration\ Target\ Standard_i \times Volume_i]}{\sum Volume_i}$$

Where:

Subconfiguration Target Standard<sub>i</sub> = fuel consumption standard for each group of vehicles with same payload, towing capacity and drive configuration (gallons per 100 miles).

Volume<sub>i</sub> = production volume of each unique subconfiguration of a model type based upon payload, towing capacity and drive configuration.

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

(B) A manufacturer may group together other subconfigurations if it uses the lowest target value calculated for any of the subconfigurations.

(ii) For Phase 1, manufacturers must select an alternative for

subconfiguration target standards at the same time they submit the model year 2016 pre-model year Report, specified in § 535.8. Once selected, the decision cannot be reversed and the manufacturer must continue to comply with the same alternative for subsequent model years.

(4) *Voluntary standards.* (i) Manufacturers may choose voluntarily to comply early with fuel consumption standards for model years 2013 through 2015, as determined in paragraphs (a)(4)(iii) and (iv) of this section, for example, in order to begin accumulating credits through over-compliance with the applicable standard. A manufacturer choosing early compliance must comply with all the vehicles and engines it manufactures in each regulatory category for a given model year.

(ii) A manufacturer must declare its intent to voluntarily comply with fuel consumption standards at the same time it submits a Pre-Model Report, prior to the compliance model year beginning as specified in § 535.8; and, once selected, the decision cannot be reversed and the manufacturer must continue to comply for each subsequent model year for all the vehicles and engines it manufactures in each regulatory category for a given model year.

(iii) Calculate separate subconfiguration target standards for compression-ignition and spark-ignition vehicles for model years 2013 through 2015 using the equation in paragraph (a)(2)(ii) of this section, substituting the appropriate values for the coefficients in the following table as appropriate:

TABLE 7—COEFFICIENTS FOR VOLUNTARY SUBCONFIGURATION TARGET STANDARDS

Model year(s)	c	d
<b>CI Vehicle Coefficients</b>		
2013 and 14 .....	0.0004695	3.615
2015 .....	0.0004656	3.595
<b>SI Vehicle Coefficients</b>		
2013 and 14 .....	0.0005424	4.175
2015 .....	0.0005390	4.152

(iv) Calculate the fleet average fuel consumption standards for model years 2013 through 2015 using the equation in paragraph (a)(3) of this section.

(5) *Exclusion of vehicles not certified as complete vehicles.* The vehicle standards in paragraph (a) of this section do not apply for vehicles that are chassis-certified with respect to EPA's criteria pollutant test procedure in 40 CFR part 86, subpart S. Any chassis-certified vehicles must comply with the vehicle standards and requirements of paragraph (b) of this section and the engine standards of paragraph (d) of this section for engines used in these vehicles. A vehicle manufacturer choosing to comply with this paragraph and that is not the engine manufacturer is required to notify the engine manufacturers that their engines are subject to paragraph (d) of this section and that it intends to use their engines in excluded vehicles.

(6) *Optional certification under this section.* Manufacturers may certify certain complete or cab-complete vehicles to the fuel consumption standards of this section. All vehicles optionally certified under this paragraph (a)(6) are deemed to be subject to the fuel consumption

standards of this section given the following conditions:

(i) For fuel consumption compliance, manufacturers may certify any complete or cab-complete spark-ignition vehicles above 14,000 pounds GVWR and at or below 26,000 pounds GVWR to the fuel consumption standards of this section.

(ii) Manufacturers may apply the provisions of this section to cab-complete vehicles based on a complete sister vehicle. In unusual circumstances, manufacturers may ask the agencies to apply these provisions to Class 2b or Class 3 incomplete vehicles that do not meet the definition of cab-complete.

(A) Except as specified in paragraph (a)(6)(iii) of this section, for purposes of this section, a complete sister vehicle is a complete vehicle of the same vehicle configuration as the cab-complete vehicle. A manufacturer may not apply the provisions of this paragraph (a)(6) to any vehicle configuration that has a four-wheel rear axle if the complete sister vehicle has a two-wheel rear axle.

(B) Calculate the target value for the fleet-average fuel consumption standard under paragraph (a)(3) of this section based on the work factor value that applies for the complete sister vehicle.

(C) Test these cab-complete vehicles using the same equivalent test weight and other dynamometer settings that apply for the complete vehicle from which you used the work factor value (the complete sister vehicle). For fuel consumption certification, manufacturers may submit the test data from that complete sister vehicle instead of performing the test on the cab-complete vehicle.

(D) Manufacturers are not required to produce the complete sister vehicle for sale to use the provisions of this paragraph (a)(6)(ii). This means the complete sister vehicle may be a carryover vehicle from a prior model year or a vehicle created solely for the purpose of testing.

(iii) For fuel consumption purposes, if a cab-complete vehicle is not of the same vehicle configuration as a complete sister vehicle due only to certain factors unrelated to coastdown performance, manufacturers may use the road-load coefficients from the complete sister vehicle for certification testing of the cab-complete vehicle, but it may not use fuel consumption data from the complete sister vehicle for certifying the cab-complete vehicle.

(7) *Loose engines.* For model year 2023 and earlier spark-ignition engines with identical hardware compared with engines used in vehicles certified to the standards of this section, where such engines are sold as loose engines or as engines installed in incomplete vehicles that are not cab-complete vehicles. Manufacturers may certify such engines to the standards of this section, subject to the following provisions:

(i) For 2020 and earlier model years, the maximum allowable U.S.-directed production volume of engines manufacturers may sell under this paragraph (a)(7) in any given model year is ten percent of the total U.S.-directed production volume of engines of that design that the manufacturer produces for heavy-duty applications for that model year, including engines it produces for complete vehicles, cab-complete vehicles, and other incomplete vehicles. The total number of engines a manufacturer may certify under this paragraph (a)(7), of all engine designs, may not exceed 15,000 in any model year. Engines produced in excess of either of these limits are not covered by your certificate. For example, a manufacturer produces 80,000 complete model year 2017 Class 2b pickup trucks with a certain engine and 10,000 incomplete model year 2017 Class 3 vehicles with that same engine, and the manufacturer did not apply the provisions of this paragraph (a)(7) to any other engine designs, it may produce up to 10,000 engines of that design for sale as loose engines under this paragraph (a)(7). If a manufacturer produced 11,000 engines of that design for sale as loose engines, the last 1,000 of them that it produced in that model year 2017 would be considered uncertified.

(ii) For model years 2021 through 2023, the U.S.-directed production volume of engines manufacturers sell under this paragraph (a)(7) in any given model year may not exceed 10,000 units. This paragraph (a)(7) does not apply for engines certified to the standards of paragraph (d) of this section and 40 CFR 1036.108.

(iii) Vehicles using engines certified under this paragraph (a)(7) are subject to the fuel consumption and emission standards of paragraph (b) of this section and 40 CFR 1037.105 and engine standards in 40 CFR 1036.150(j).

(iv) For certification purposes, engines are deemed to have a fuel consumption target values and test result equal to the fuel consumption target value and test result for the complete vehicle in the applicable test group with the highest equivalent test weight, except as specified in paragraph (a)(7)(iv)(B) of this part. Manufacturers

use these values to calculate target values and the fleet- average fuel consumption rate. Where there are multiple complete vehicles with the same highest equivalent test weight, select the fuel consumption target value and test result as follows:

(A) If one or more of the fuel consumption test results exceed the applicable target value, use the fuel consumption target value and test result of the vehicle that exceeds its target value by the greatest amount.

(B) If none of the fuel consumption test results exceed the applicable target value, select the highest target value and set the test result equal to it. This means that the manufacturer may not generate fuel consumption credits from vehicles certified under this paragraph (a)(7).

(8) *Alternative fuel vehicle conversions.* Alternative fuel vehicle conversions may demonstrate compliance with the standards of this part or other alternative compliance approaches allowed by EPA in 40 CFR 85.525.

(9) *Advanced, innovative and off-cycle technologies.* For vehicles subject to Phase 1 standards, manufacturers may generate separate credit allowances for advanced and innovative technologies as specified in § 535.7(f)(1) and (2). For vehicles subject to Phase 2 standards, manufacturers may generate separate credits allowance for off-cycle technologies in accordance with § 535.7(f)(2). Separate credit allowances for advanced technology vehicles cannot be generated; instead manufacturers may use the credit multipliers specified in § 535.7(f)(1)(iv) through model year 2026.

(10) *Useful life.* The following useful life values apply for the standards of this section:

(i) 120,000 miles or 10 years, whichever comes first, for Class 2b through Class 3 heavy-duty pickup trucks and vans certified to Phase 1 standards.

(ii) 150,000 miles or 15 years, whichever comes first, for Class 2b through Class 3 heavy-duty pickup trucks and vans certified to Phase 2 standards.

(iii) For Phase 1 credits that you calculate based on a useful life of 120,000 miles, multiply any banked credits that you carry forward for use into the Phase 2 program by 1.25. For Phase 1 credit deficits that you generate based on a useful life of 120,000 miles multiply the credit deficit by 1.25 if offsetting the shortfall with Phase 2 credits.

(11) *Compliance with standards.* A manufacturer complies with the

standards of this part as described in § 535.10.

(b) *Heavy-duty vocational vehicles.* Each manufacturer building complete or incomplete heavy-duty vocational vehicles shall comply with the fuel consumption standards in this paragraph (b) expressed in gallons per 1000 ton-miles. Manufacturers must apply the fuel consumption standards in this paragraph (b) to the same vehicles using the same options used to comply with EPA in 40 CFR 1037.105. Engines used in heavy-duty vocational vehicles shall comply with the standards in paragraph (d) of this section. Each vehicle must be manufactured to comply for its full useful life. Standards apply to the vehicle subfamilies based upon the vehicle service classes within each of the vocational vehicle regulatory subcategories in accordance with § 535.4 and based upon the applicable modeling and testing specified in § 535.6. Determine the duty cycles that apply to vocational vehicles according to 40 CFR 1037.140 and 1037.150(z).

(1) *Mandatory standards.* Heavy-duty vocational vehicle subfamilies produced for Phase 1 must comply with the fuel consumption standards in paragraph (b)(3) of this section. For Phase 2, each vehicle manufacturer of heavy-duty vocational vehicle subfamilies must comply with the fuel consumption standards in paragraph (b)(4) of this section.

(i) For model years 2016 to 2020, the heavy-duty vocational vehicle category is subdivided by GVWR into three regulatory subcategories as defined in § 535.4, each with its own assigned standard.

(ii) For model years 2021 and later, the heavy-duty vocational vehicle category is subdivided into 15 regulatory subcategories depending upon whether vehicles are equipped with a compression or spark-ignition engine, as defined in § 535.4. Standards also differ based upon vehicle service class and intended vehicle duty cycles. See 40 CFR 1037.140 and 1037.150(z).

(iii) For purposes of certifying vehicles to fuel consumption standards, manufacturers must divide their product lines in each regulatory subcategory into vehicle families that have similar emissions and fuel consumption features, as specified by EPA in 40 CFR 1037.230. These families will be subject to the applicable standards. Each vehicle family is limited to a single model year.

(2) *Voluntary compliance.* (i) For model years 2013 through 2015, a manufacturer may choose voluntarily to comply early with the fuel consumption standards provided in paragraph (b)(3)

of this section. For example, a manufacturer may choose to comply early in order to begin accumulating credits through over-compliance with the applicable standards. A manufacturer choosing early compliance must comply with all the vehicles and engines it manufactures in each regulatory category for a given model year.

(ii) A manufacturer must declare its intent to voluntarily comply with fuel consumption standards and identify its plans to comply before it submits its first application for a certificate of conformity for the respective model year as specified in § 535.8; and, once selected, the decision cannot be reversed and the manufacturer must continue to comply for each subsequent

model year for all the vehicles and engines it manufactures in each regulatory category for a given model year.  
 (3) *Regulatory subcategory standards for model years 2013 to 2020.* The mandatory and voluntary fuel consumption standards for heavy-duty vocational vehicles are given in the following table:

**TABLE 8—PHASE 1 VOCATIONAL VEHICLE FUEL CONSUMPTION STANDARDS**  
 [Gallons per 1000 ton-miles]

Regulatory subcategories	Vocational LHD Vehicles	Vocational MHD Vehicles	Vocational HHD Vehicles
<b>Model Years 2013 to 2016 Voluntary Standards</b>			
Standard .....	38.1139	22.9862	22.2004
<b>Model Years 2017 to 2020 Mandatory Standards</b>			
Standard .....	36.6405	22.1022	21.8075

(4) *Regulatory subcategory standards for model years 2021 and later.* The mandatory fuel consumption standards

for heavy-duty vocational vehicles are given in the following table:  
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Table 9 – Phase 2 Vocational Vehicle Fuel Consumption Standards (gallons per 1000 ton-miles)

Model Years 2021 to 2023 Standards for CI Vehicles			
Duty Cycle	LHD Vocational Vehicles	MHD Vocational Vehicles	Vocational HHD Vehicles
Urban	41.6503	29.0766	30.2554
Multi-Purpose	36.6405	26.0314	25.6385
Regional	30.5501	22.9862	20.1375
Model Years 2021 to 2023 Standards for SI Vehicles			
Duty Cycle	LHD Vocational Vehicles	MHD and HHD Vocational Vehicles	
Urban	51.8735	36.9078	
Multi-Purpose	45.7972	32.9695	
Regional	37.6955	29.3687	
Model Years 2024 to 2026 Standards for CI Vehicles			
Duty Cycle	Vocational LHD Vehicles	Vocational MHD Vehicles	Vocational HHD Vehicles
Urban	37.8193	26.6208	27.7996
Multi-Purpose	33.7917	24.1650	23.7721
Regional	29.0766	21.7092	19.0570
Model Years 2024 to 2026 Standards for SI Vehicles			

Duty Cycle	Vocational LHD Vehicles	Vocational MHD and HHD Vehicles	
Urban	48.6103	34.8824	
Multi-Purpose	43.3217	31.3942	
Regional	36.4577	28.2435	
Model Years 2027 and later Standards for CI Vehicles			
Duty Cycle	Vocational LHD Vehicles	Vocational MHD Vehicles	Vocational HHD Vehicles
Urban	36.0511	25.3438	26.4244
Multi-Purpose	32.4165	23.0845	22.5933
Regional	28.5855	21.4145	18.5658
Model Years 2027 and later Standards for SI Vehicles			
Duty Cycle	Vocational LHD Vehicles	Vocational MHD and HHD Vehicles	
Urban	46.4724	33.4196	
Multi-Purpose	41.8589	30.1564	
Regional	35.8951	27.7934	

**BILLING CODE 4910-59-C****(5) Subfamily standards.**

Manufacturers may specify a family emission limit (FEL) in terms of fuel consumption for each vehicle subfamily. The FEL may not be less than the result of fuel consumption modeling from 40 CFR 1037.520. The FELs is the fuel consumption standards for the vehicle subfamily instead of the standards specified in paragraph (b)(3) and (4) of this section and can be used for calculating fuel consumption credits in accordance with § 535.7.

(6) *Alternate standards for custom chassis vehicles for model years 2021 and later.* Manufacturers may elect to

certify certain vocational vehicles to the alternate standards for custom chassis vehicles specified in this paragraph (b)(6) instead of the standards specified in paragraph (b)(4) of this section. Note that, although these standards were established for custom chassis vehicles, manufacturers may apply these provisions to any qualifying vehicle even though these standards were established for custom chassis vehicles. For example, large diversified vehicle manufacturers may certify vehicles to the refuse hauler standards of this section as long as the manufacturer ensures that those vehicles qualify as refuse haulers when placed into service.

GEM simulates vehicle operation for each type of vehicle based on an assigned vehicle service class, independent of the vehicle's actual characteristics, as shown in Table 10 of this section; however, standards apply for the vehicle's useful life based on its actual characteristics as specified in paragraph (b)(10) of this section. Vehicles certified to these alternative standards must use engines certified to requirements under paragraph (d) of this section and 40 CFR part 1036 for the appropriate model year, except that motor homes and emergency vehicles may use engines certified with the loose-engine provisions of paragraph

(a)(7) of this section and 40 CFR 1037.150(m). This also applies for vehicles meeting standards under

paragraphs (a)(6)(iv) through (vi) of this section. The fuel consumption

standards for custom chassis vehicles are given in the following table:

TABLE 10—PHASE 2 CUSTOM CHASSIS FUEL CONSUMPTION STANDARDS

[Gallon per 1,000 ton-mile]

Vehicle type <sup>1</sup>	Assigned vehicle service class	MY 2021	MY 2027
School Bus .....	MHD Vehicle .....	28.5855	26.6208
Motor Home .....	MHD Vehicle .....	22.3969	22.2004
Coach Bus .....	HHD Vehicle .....	20.6287	20.1375
Other bus .....	HHD Vehicle .....	29.4695	28.0943
Refuse hauler .....	HHD Vehicle .....	30.7466	29.2731
Concrete mixer .....	HHD Vehicle .....	31.3360	31.0413
Mixed-use vehicle .....	HHD Vehicle .....	31.3360	31.0413
Emergency Vehicle .....	HHD Vehicle .....	31.8271	31.3360

<sup>1</sup> Vehicle types are generally defined in § 535.3. “Other bus” includes any bus that is not a school bus or a coach bus. A “mixed-use vehicle” is one that meets at least one of the criteria specified in 40 CFR 1037.631(a)(1) or at least one of the criteria in 40 CFR 1037.631(a)(2), but not both.

(i) Manufacturers may generate or use fuel consumption credits for averaging to demonstrate compliance with the alternative standards as described in § 535.7(c). This requires that manufacturers specify a Family Emission Limit (FEL) for fuel consumption for each vehicle subfamily. The FEL may not be less than the result of emission modeling as described in this paragraph (b). These FELs serve as the fuel consumption standards for the vehicle subfamily instead of the standards specified in this paragraph (b)(6). Manufacturers may only use fuel consumption credits for vehicles certified to the optional standards in this paragraph (b)(6) as specified in § 535.7(c)(6) through (8) and you may not bank or trade fuel consumption credits from any vehicles certified under this paragraph (b)(6).

(ii) For purposes of this paragraph (b)(6), each separate vehicle type identified in Table 10 of this section is in a separate averaging set.

(iii) For purposes of emission and fuel consumption modeling under 40 CFR 1037.520, consider motor homes and coach buses to be subject to the Regional duty cycle, and consider all other vehicles to be subject to the Urban duty cycle.

(iv) Emergency vehicles are deemed to comply with the standards of this paragraph (b)(6) if manufacturers use tires with TRRL at or below 8.4 kg/ton (8.7 g/ton for model years 2021 through 2026).

(v) Concrete mixers are deemed to comply with the standards of this paragraph (b)(6) if manufacturers use tires with TRRL at or below 7.1 kg/ton (7.6 g/ton for model years 2021 through 2026).

(vi) Motor homes are deemed to comply with the standards of this

paragraph (b)(6) if manufacturers use the following technologies:

(A) Tires with TRRL at or below 6.0 kg/ton (6.7 g/ton for model years 2021 through 2026).

(B) Automatic tire inflation systems or tire pressure monitoring systems with wheels on all axles.

(C) Tire pressure monitoring systems must use low pressure warning and malfunction telltales in clear view of the driver as specified in S4.3 and S4.4 of 49 CFR 571.138.

(vii) Small business manufacturers using the alternative standards for custom chassis vehicles under this paragraph (b)(6) may use fuel consumption credits subject to the unique provisions in § 535.7(a)(9).

(7) *Advanced, innovative and off-cycle technologies.* For vocational vehicles subfamilies subject to Phase 1 standards, manufacturers must create separate vehicle subfamilies for vehicles that contain advanced or innovative technologies and group those vehicles together in a vehicle subfamily if they use the same advanced or innovative technologies. Manufacturers may generate separate credit allowances for advanced and innovative technologies as specified in § 535.7(f)(1) and (2). For vehicle subfamilies subject to Phase 2 standards, manufacturers may generate separate credit allowances for off-cycle technologies in accordance with § 535.7(f)(2). Separate credit allowances for advanced technology vehicles cannot be generated but instead manufacturers may use the credit multipliers specified in § 535.7(f)(1)(iv) through model year 2026.

(8) *Certifying across service classes.* A manufacturer may optionally certify vocational vehicle subfamilies to the standards and useful life applicable to a heavier vehicle service class (such as MHD vocational vehicles instead of

LHD vocational vehicles). Provisions related to generating fuel consumption credits apply as follows:

(i) If a manufacturer certifies all its vehicles from a given vehicle service class in a given model year to the standards and useful life that applies for a heavier vehicle service class, it may generate credits as appropriate for the heavier service class.

(ii) Class 8 hybrid vehicles with light or medium heavy-duty engines may be certified to compression-ignition standards for the Heavy HDV service class. A manufacturer may generate and use credits as allowed for the Heavy HDV service class.

(iii) Except as specified in paragraphs (b)(8)(i) and (ii) of this section, a manufacturer may not generate credits with the vehicle. If you include lighter vehicles in a subfamily of heavier vehicles with an FEL below the standard, exclude the production volume of lighter vehicles from the credit calculation. Conversely, if a manufacturer includes lighter vehicles in a subfamily with an FEL above the standard, it must include the production volume of lighter vehicles in the credit calculation.

(9) *Off-road exemptions.* This section provides an exemption for heavy-duty vocational vehicle subfamilies, including vocational tractors that are intended to be used extensively in off-road environments such as forests, oil fields, and construction sites from the fuel consumption standards in this paragraph (b). Vehicle exempted by this part do not comply with vehicle standards in this paragraph (b), but the engines in these vehicles must meet the engine requirements of paragraph (d) of this section. Note that manufacturers may not include these exempted vehicles in any credit calculations under this part.



(i) *Qualifying criteria.* Vocational vehicles intended for off-road use are exempt without request, subject to the provisions of this section, if they are primarily designed to perform work off-road (such as in oil fields, mining, forests, or construction sites), and they meet at least one of the criteria of paragraph (b)(9)(i)(A) of this section and at least one of the criteria of paragraph (b)(9)(i)(B) of this section. See paragraph (b)(6) of this section for alternate standards that apply for vehicles meeting only one of these sets of criteria.

(A) The vehicle must have affixed components designed to work inherently in an off-road environment (such as hazardous material equipment or off-road drill equipment) or be designed to operate at low speeds such that it is unsuitable for normal highway operation.

(B) The vehicle must meet one of the following criteria:

(1) Have an axle that has a gross axle weight rating (GAWR) at or above 29,000 pounds.

(2) Have a speed attainable in 2.0 miles of not more than 33 mi/hr.

(3) Have a speed attainable in 2.0 miles of not more than 45 mi/hr, an unloaded vehicle weight that is not less than 95 percent of its gross vehicle weight rating, and no capacity to carry occupants other than the driver and operating crew.

(4) Have a maximum speed at or below 54 mi/hr. A manufacturer may consider the vehicle to be appropriately speed-limited if engine speed at 54 mi/hr is at or above 95 percent of the engine's maximum test speed in the highest available gear. A manufacturer may alternatively limit vehicle speed by programming the engine or vehicle's electronic control module in a way that is tamper-resistant.

(ii) *Tractors.* The provisions of this section may apply for tractors only if each tractor qualifies as a vocational tractor under paragraph (c)(9) of this section or is granted approval for the exemption as specified in paragraph (b)(9)(iii) of this section.

(iii) *Preliminary Approval before Certification.* If a manufacturer has unusual circumstances where it may be questionable whether its vehicles qualify for the off-road exemption of this part, the manufacturer may send the agencies information before finishing its application for certification (see 40 CFR 1037.205) for the applicable vehicles and ask for a preliminary informal approval. The agencies will review the request and make an appropriate determination in accordance with 40 CFR 1037.210. The agencies will

generally not reverse a decision where they have given a manufacturer preliminary approval, unless the agencies find new information supporting a different decision. However, the agencies will normally not grant relief in cases where the vehicle manufacturer has credits or can otherwise comply with the applicable standards.

(iv) *Recordkeeping and reporting.* (A) A manufacturer must keep records to document that its exempted vehicle configurations meet all applicable requirements of this section. Keep these records for at least eight years after you stop producing the exempted vehicle model. The agencies may review these records at any time.

(B) A manufacturer must also keep records of the individual exempted vehicles you produce, including the vehicle identification number and a description of the vehicle configuration.

(C) Within 90 days after the end of each model year, manufacturers must send to EPA a report as specified in § 535.8(g)(7) and EPA will make the report available to NHTSA.

(v) *Compliance.* (A) Manufacturers producing vehicles meeting the off-road exemption criteria in paragraph (b)(9)(i) of this section or that are granted a preliminary approval comply with the standards of this part.

(B) In situations where a manufacturer would normally ask for a preliminary approval subject to paragraph (b)(9)(iii) of this section but introduces its vehicle into U.S. commerce without seeking approval first from the agencies, those vehicles violate compliance with the fuel consumption standards of this part and the EPA provisions under 40 CFR 1068.101(a)(1).

(C) If at any time, the agencies find new information that contradicts a manufacturer's use of the off-road exemption of this part, the manufacturer's vehicles will be determined to be non-compliant with the regulations of this part and the manufacturer may be liable for civil penalties.

(10) *Useful life.* The following useful life values apply for the standards of this section:

(i) 110,000 miles or 10 years, whichever comes first, for vocational LHD vehicles certified to Phase 1 standards.

(ii) 150,000 miles or 15 years, whichever comes first, for vocational LHD vehicles certified to Phase 2 standards.

(iii) 185,000 miles or 10 years, whichever comes first, for vocational MHD vehicles for Phase 1 and 2.

(iv) 435,000 miles or 10 years, whichever comes first, for vocational HHD vehicles for Phase 1 and 2.

(v) For Phase 1 credits calculated based on a useful life of 110,000 miles, multiply any banked credits carried forward for use into the Phase 2 program by 1.36. For Phase 1 credit deficits generated based on a useful life of 110,000 miles multiply the credit deficit by 1.36, if offsetting the shortfall with Phase 2 credits.

(11) *Recreational vehicles.*

Recreational vehicles manufactured after model year 2020 must comply with the fuel consumption standards of this section. Manufacturers producing these vehicles may also certify to fuel consumption standards from 2014 through model year 2020.

Manufacturers may earn credits retroactively for early compliance with fuel consumption standards. Once selected, a manufacturer cannot reverse the decision and the manufacturer must continue to comply for each subsequent model year for all the vehicles it manufactures in each regulatory subcategory for a given model year.

(12) *Loose engines.* Manufacturers may certify certain spark-ignition engines along with chassis-certified heavy-duty vehicles where there are identical engines used in those vehicles as described in 40 CFR 86.1819(k)(8) and 40 CFR 1037.150(m). Vehicles in which those engines are installed are subject to standards under this part.

(13) *Compliance with standards.* A manufacturer complies with the standards of this part as described in § 535.10.

(c) *Truck tractors.* Each manufacturer building truck tractors, except vocational tractors or vehicle constructed in accordance with § 571.7(e), with a GVWR above 26,000 pounds shall comply with the fuel consumption standards in this paragraph (c) expressed in gallons per 1000 ton-miles. Manufacturers must apply the fuel consumption standards in this paragraph (c) to the same vehicles using the same options used to comply with EPA in 40 CFR 1037.106. Engines used in heavy-duty truck tractor vehicles shall comply with the standards in paragraph (d) of this section. Each vehicle must be manufactured to comply for its full useful life. Standards apply to the vehicle subfamilies within each of the tractor vehicle regulatory subcategories in accordance with § 535.4 and 40 CFR 1037.230 and based upon the applicable modeling and testing specified in § 535.6. Determine the vehicles in each regulatory subcategory in accordance with 40 CFR 1037.140.

(1) *Mandatory standards.* For model years 2016 and later, each manufacturer's truck tractor subfamilies must comply with the fuel consumption standards in paragraph (c)(3) of this section.

(i) Based on the roof height and the design of the cab, the truck tractor category is divided into subcategories as described in § 535.4. The standards that apply to each regulatory subcategory are shown in paragraphs (c)(2) and (3) of this section, each with its own assigned standard.

(A) When calculating a vehicle's roof height and trailer's length should be determined from nominal design specifications, as provided in 40 CFR 1037.140.

(B) Specify design values for roof height and trailer length to the nearest inch.

(ii) For purposes of certifying vehicles to fuel consumption standards,

manufacturers must divide their product lines in each regulatory subcategory into vehicles subfamilies that have similar emissions and fuel consumption features, as specified by EPA in 40 CFR 1037.230, and these subfamilies will be subject to the applicable standards. Each vehicle subfamily is limited to a single model year.

(iii) Standards for truck tractor engines are given in paragraph (d) of this section.

(2) *Voluntary compliance.* (i) For model years 2013 through 2015, a manufacturer may choose voluntarily to comply early with the fuel consumption standards provided in paragraph (c)(3) of this section. For example, a manufacturer may choose to comply early in order to begin accumulating credits through over-compliance with the applicable standards. A manufacturer choosing early

compliance must comply with all the vehicles and engines it manufacturers in each regulatory category for a given model year.

(ii) A manufacturer must declare its intent to voluntarily comply with fuel consumption standards and identify its plans to comply before it submits its first application for a certificate of conformity for the respective model year as specified in § 535.8; and, once selected, the decision cannot be reversed and the manufacturer must continue to comply for each subsequent model year for all the vehicles and engines it manufacturers in each regulatory category for a given model year.

(3) *Regulatory subcategory standards.* The fuel consumption standards for truck tractors, except for vocational tractors, are given in the following table:

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Table 11 – Truck Tractor Fuel Consumption Standards (gallons per 1,000 ton-miles)

Phase 1 - Model Years 2013 to 2015 Voluntary Standards				
Regulatory	Day Cab		Sleeper Cab	Heavy-Haul
Subcategories	Class 7	Class 8	Class 8	
Low Roof	10.5108	7.9568	6.6798	
Mid Roof	11.6896	8.6444	7.4656	
High Roof	12.1807	9.0373	7.3674	
Phase 1 - Model Year 2016 Mandatory Standard				
Low Roof	10.5108	7.9568	6.6798	
Mid Roof	11.6896	8.6444	7.4656	
High Roof	12.1807	9.0373	7.3674	
Phase 1 - Model Years 2017 to 2020 Mandatory Standards				
Low Roof	10.2161	7.8585	6.4833	
Mid Roof	11.2967	8.4479	7.1709	
High Roof	11.7878	8.7426	7.0727	
Phase 2 - Model Years 2021 to 2023 Mandatory Standards				
Low Roof	10.36346	7.90766	7.10216	5.14735
Mid Roof	11.11984	8.38900	7.66208	
High Roof	11.14931	8.40864	7.43615	
Phase 2 - Model Years 2024 to 2026 Mandatory Standards				
Low Roof	9.80354	7.48527	6.67976	4.93124
Mid Roof	10.52063	7.94695	7.22004	
High Roof	10.47151	7.89784	6.94499	
Phase 2 - Model Years 2027 and later Mandatory Standards				
Low Roof	9.44990	7.21022	6.29666	4.74460
Mid Roof	10.15717	7.66208	6.83694	
High Roof	9.82318	7.43615	6.31631	

(4) *Subfamily standards.* Manufacturers may generate or use fuel consumption credits for averaging, banking, and trading as described in § 535.7(c). This requires that manufacturers calculate a credit quantity if they specify a family emission limit (FEL) that is different

than the standard specified in this section. The FEL may not be less than the result of emission and fuel consumption modeling from 40 CFR 1037.520. These FELs serve as the emission standards for the specific vehicle subfamily instead of the

standards specified in paragraph (c)(2) of this section.

(5) *Alternate standards for tractors at or above 120,000 pounds GCWR.* Manufacturers may certify tractors at or above 120,000 pounds GCWR to the following fuel consumption standards in the following table:

TABLE 12—ALTERNATE FUEL CONSUMPTION STANDARDS FOR TRACTORS ABOVE 120,000 POUNDS GCWR FOR 2021 MY AND LATER  
[Gallons per 1,000 ton-miles]

Regulatory subcategory	Model years 2021–2023	Model years 2024–2026	Model years 2026 and later
Heavy Class 8 Low-Roof Day Cab .....	5.25540	4.99018	4.80354
Heavy Class 8 Low-Roof Sleeper Cab .....	4.62672	4.37132	4.16503
Heavy Class 8 Mid-Roof Day Cab .....	5.46169	5.18664	4.99018
Heavy Class 8 Mid-Roof Sleeper Cab .....	4.87230	4.60707	4.39096
Heavy Class 8 High-Roof Day Cab .....	5.35363	5.04912	4.77407
Heavy Class 8 High-Roof Sleeper Cab .....	4.62672	4.34185	4.02750

(6) *Advanced, innovative and off-cycle technologies.* For tractors subject to Phase 1 standards, manufacturers must create separate vehicle subfamilies for vehicles that contain advanced or innovative technologies and group those vehicles together in a vehicle subfamily if they use the same advanced or innovative technologies. Manufacturers may generate separate credit allowances for advanced and innovative technologies as specified in § 535.7(f)(1) and (2). For vehicles subject to Phase 2 standards, manufacturers may generate separate credits allowance for off-cycle technologies in accordance with § 535.7(f)(2). Separate credit allowances for advanced technology vehicles cannot be generated but instead manufacturers may use the credit multipliers specified in § 535.7(f)(1)(iv) through model year 2026.

(7) *Certifying across service classes.* Manufacturers may certify Class 7 tractors to Class 8 tractors standards as follows:

(i) A manufacturer may optionally certify 4x2 tractors with heavy heavy-duty engines to the standards and useful life for Class 8 tractors, with no restriction on generating or using fuel consumption credits within the Class 8 averaging set.

(ii) A manufacturer may optionally certify a Class 7 tractor to the standards and useful life applicable to Class 8 tractors. Credit provisions apply as follows:

(A) If a manufacturer certifies all of its Class 7 tractors to Class 8 standards, it may use these Heavy HDV credits without restriction.

(B) This paragraph (c)(7)(ii)(B) applies if a manufacturer certifies some Class 7 tractors to Class 8 standards under this

paragraph (c)(7)(ii) but not all of them. If a manufacturer includes Class 7 tractors in a subfamily of Class 8 tractors with an FEL below the standard, exclude the production volume of Class 7 tractors from the credit calculation. Conversely, if a manufacturer includes Class 7 tractors in a subfamily of Class 8 tractors with an FEL above the standard, it must include the production volume of Class 7 tractors in the credit calculation.

(8) *Expanded families.* Manufacturers may combine dissimilar vehicles into single vehicle subfamilies for applying standards and for testing in special circumstances as follows:

(i) For a Phase 1 vehicle model that straddles a roof-height, cab type, or GVWR division, manufacturers can include all the vehicles in the same vehicle family if it certifies the vehicle family to the more stringent standard. For roof height, the manufacturer must certify to the taller roof standard. For cab-type and GVWR, the manufacturers must certify to the numerically lower standard.

(ii) For a Phase 2 vehicle model that includes a range of GVWR values that straddle weight classes, manufacturers may include all the vehicles in the same vehicle family if it certifies the vehicle family to the numerically lower fuel consumption standard from the affected service classes. Vehicles that are optionally certified to a more stringent standard under this paragraph are subject to useful-life and all other provisions corresponding to the weight class with the numerically lower fuel consumption standard. For a Phase 2 tractor model that includes a range of roof heights that straddle subcategories, a manufacturer may include all the

vehicles in the same vehicle family if it certifies the vehicle family to the appropriate subcategory as follows:

(A) A manufacturer may certify mid-roof tractors as high-roof tractors, but it may not certify high-roof tractors as mid-roof tractors.

(B) For tractor families straddling the low-roof/mid-roof division, a manufacturer may certify the family based on the primary roof-height as long as no more than 10 percent of the tractors are certified to the otherwise inapplicable subcategory. For example, if 95-percent of the tractors in the family are less than 120 inches tall, and the other 5 percent are 122 inches tall, a manufacturer may certify the tractors as a single family in the low-roof subcategory.

(C) Determine the appropriate aerodynamic bin number based on the actual roof height if the  $C_dA$  value is measured. However, use the GEM input for the bin based on the standards to which the manufacturer certifies. For example, of a manufacturer certifies as mid roof tractors some low-roof tractors with a measured  $C_dA$  value of 4.2 m<sup>2</sup>, it qualifies as Bin IV; and must input into GEM the mid-roof Bin IV value of 5.85 m<sup>2</sup>.

(9) *Vocational tractors.* Tractors meeting the definition of vocational tractors in 49 CFR 523.2 must comply with requirements for heavy-duty vocational vehicles specified in paragraphs (b) and (d) of this section. For Phase 1, Class 7 and Class 8 tractors certified or exempted as vocational tractors are limited in production to no more than 21,000 vehicles in any three consecutive model years. If a manufacturer is determined as not applying this allowance in good faith by

EPA in its applications for certification in accordance with 40 CFR 1037.205 and 1037.610, a manufacturer must comply with the tractor fuel consumption standards in paragraph (c)(3) of this section. No production limit applies for vocational tractors subject to Phase 2 standards.

(10) *Small business manufacturers converting to mid roof or high roof configurations.* Small manufacturers are to allowed convert low and mid roof tractors to high roof configurations without recertification, provided it is for the purpose of building a custom sleeper tractor or conversion to a natural gas tractor as specified in 40 CFR 1037.150(r).

(11) *Useful life.* The following useful life values apply for the standards of this section:

(i) 185,000 miles or 10 years, whichever comes first, for vehicles at or below 33,000 pounds GVWR.

(ii) 435,000 miles or 10 years, whichever comes first, for vehicles above 33,000 pounds GVWR.

(12) *Conversion to high-roof configurations.* Secondary vehicle manufacturers that qualify as small manufacturers may convert low- and mid-roof tractors to high-roof configurations without recertification for the purpose of building a custom sleeper tractor or converting it to run on natural gas, as follows:

(i) The original low- or mid-roof tractor must be covered by a valid certificate of conformity by EPA.

(ii) The modifications may not increase the frontal area of the tractor beyond the frontal area of the equivalent high-roof tractor with the corresponding standard trailer. If a manufacturer cannot use the original manufacturer's roof fairing for the high-roof tractor, use good engineering judgment to achieve similar or better aerodynamic performance.

(iii) The agencies may require that these manufacturers submit annual production reports as described in § 535.8 and 40 CFR 1037.250 indicating the original roof height for requalified vehicles.

(13) *Compliance with standards.* A manufacturer complies with the standards of this part as described in § 535.10.

(d) *Heavy-duty engines.* Each manufacturer of heavy-duty engines shall comply with the fuel consumption standards in this paragraph (d) expressed in gallons per 100 horsepower-hour. Manufacturers must apply the fuel consumption standards in this paragraph (d) to the same engines using the same options used to comply with EPA in 40 CFR 1036.108. Each engine must be manufactured to comply for its full useful life, expressed in service miles, operating hours, or calendar years, whatever comes first. The provisions of this part apply to all new 2014 model year and later heavy-duty engines fueled by conventional and alternative fuels and manufactured for use in heavy-duty tractors or vocational vehicles. Standards apply to the engine and powertrain families and sub-families based upon the primary intended service classes within each of the engine regulatory subcategories as described in § 535.4 and based upon the applicable modeling and testing specified in § 535.6.

(1) *Mandatory standards.* Manufacturers of heavy-duty engine families shall comply with the mandatory fuel consumption standards in paragraphs (d)(3) through (6) of this section for model years 2017 and later for compression-ignition engines and for model years 2016 and later for spark-ignition engines.

(i) The heavy-duty engine regulatory category is divided into six regulatory subcategories, five compression-ignition subcategories and one spark-ignition subcategory, as shown in Table 14 of this section.

(ii) Separate standards exist for engine families manufactured for use in heavy-duty vocational vehicles and in truck tractors.

(iii) For purposes of certifying engines to fuel consumption standards, manufacturers must divide their product lines in each regulatory subcategory into engine families. Fuel consumption standards apply each

model year to the same engine families used to comply with EPA standards in 40 CFR 1036.108 and 40 CFR 1037.230. An engine family is designated under the EPA program based upon testing specified in 40 CFR part 1036, subpart F, and the engine family's primary intended service class. Each engine family manufactured for use in a heavy-duty tractor or vocational vehicle must be certified to the primary intended service class that it is designed for in accordance with 40 CFR 1036.108 and 1036.140.

(2) *Voluntary compliance.* (i) For model years 2013 through 2016 for compression-ignition engine families, and for model year 2015 for spark-ignition engine families, a manufacturer may choose voluntarily to comply with the fuel consumption standards provided in paragraphs (d)(3) through (5) of this section. For example, a manufacturer may choose to comply early in order to begin accumulating credits through over-compliance with the applicable standards. A manufacturer choosing early compliance must comply with all the vehicles and engines it manufacturers in each regulatory category for a given model year except in model year 2013 the manufacturer may comply with individual engine families as specified in 40 CFR 1036.150(a)(2).

(ii) A manufacturer must declare its intent to voluntarily comply with fuel consumption standards and identify its plans to comply before it submits its first application for a certificate of conformity for the respective model year as specified in § 535.8; and, once selected, the decision cannot be reversed and the manufacturer must continue to comply for each subsequent model year for all the vehicles and engines it manufacturers in each regulatory category for a given model year.

(3) *Regulatory subcategory standards.* The primary fuel consumption standards for heavy-duty engine families are given in the following table:

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Table 13 – Primary Heavy-Duty Engine Fuel Consumption Standards (gallons per 100 hp-hr)

Phase 1 – Voluntary Standards						
Regulatory Subcategory	CI LHD Engines and all Other Engines	CI MHD Engines and all Other Engines	HHD CI Engines and all Other Engines			SI Engines
Application	Vocational	Vocational	Tractor	Vocational	Tractor	All
2015	-					7.0552
2013 to 2016	5.8939	5.8939	4.9312	5.5697	4.666	-
Phase 1 - Mandatory Standards						
Regulatory Subcategory	CI LHD Engines and all Other Engines	CI MHD Engines and all Other Engines	CI HHD Engines and all Other Engines			SI Engines
Application	Vocational	Vocational	Tractor	Vocational	Tractor	All
2016	-					7.0552
2017 to 2020	5.6582	5.6582	4.7839	5.4519	4.5187	7.0552
Phase 2 - Mandatory Standards						
Regulatory Subcategory	CI LHD Engines and all Other Engines	CI MHD Engines and all Other Engines	CI HHD Engines and all Other Engines			SI Engines (except HHD engines)
Application	Vocational	Vocational	Tractor	Vocational	Tractor	All
2021 to 2023	5.5305	5.3536	4.6464	5.0393	4.3910	7.0552
2024 to 2026	5.4519	5.2849	4.5285	4.9705	4.2829	7.0552
2027 and later	5.4224	5.2554	4.4892	4.9411	4.2436	7.0552

(4) *Alternate subcategory standards.* The alternative fuel consumption standards for heavy-duty compression-ignition engine families are as follows:

(i) Manufacturers entering the voluntary program in model years 2014 through 2016, may choose to certify compression-ignition engine families unable to meet standards provided in paragraph (d)(3) of this section to the alternative fuel consumption standards of this paragraph (d)(4).

(ii) Manufacturers may not certify engines to these alternate standards if they are part of an averaging set in which they carry a balance of banked credits. For purposes of this section,

manufacturers are deemed to carry credits in an averaging set if they carry credits from advance technology that are allowed to be used in that averaging set in accordance with § 535.7(d)(12).

(iii) The emission standards of this section are determined as specified by EPA in 40 CFR 1036.620(a) through (c) and should be converted to equivalent fuel consumption values.

(5) *Alternate phase-in standards.* Manufacturers have the option to comply with EPA emissions standards for compression-ignition engine families using an alternative phase-in schedule that correlates with EPA's OBD standards. If a manufacturer chooses to

use the alternative phase-in schedule for meeting EPA standards and optionally chooses to comply early with the NHTSA fuel consumption program, it must use the same phase-in schedule beginning in model year 2013 for fuel consumption standards and must remain in the program for each model year thereafter until model year 2020. The fuel consumption standard for each model year of the alternative phase-in schedule is provided in Table 15 of this section. Note that engine families certified to these standards are not eligible for early credits under § 535.7.

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Table 14 – Phase 1 Alternative Phase-In CI Engine Fuel Consumption Standards (gallons per 100 hp-hr)

Tractors	LHD Engines	MHD Engines	HHD Engines
Model Years 2013 to 2015	NA	5.0295	4.7642
Model Years 2016 to 2020 <sup>†</sup>	NA	4.7839	4.5187
Vocational	LHD Engines	MHD Engines	HHD Engines
Model Years 2013 to 2015	6.0707	6.0707	5.6680
Model Years 2016 to 2020 <sup>†</sup>	5.6582	5.6582	5.4519

<sup>†</sup>Note: these alternate standards for 2016 and later are the same as the otherwise

applicable standards for 2017 through 2020.

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(6) *Alternative fuel conversions.* Engines that have been converted to operate on alternative fuels may demonstrate compliance with the standards of this part or other alternative compliance approaches allowed by EPA in 40 CFR 85.525.

(7) *Optional certification under this section.* Manufacturers certifying spark-ignition engines to the compression-ignition standards for EPA must treat those engines as compression-ignition engines for all the provisions of this part.

(8) *Advanced, innovative and off-cycle technologies.* For engines subject to Phase 1 standards, manufacturers must create separate engine families for engines that contain advanced or innovative technologies and group those engines together in an engine family if they use the same advanced or innovative technologies. Manufacturers may generate separate credit allowances for advanced and innovative technologies as specified in § 535.7(f)(1) and (2). For engines subject to Phase 2 standards, manufacturers may generate separate credits allowance for off-cycle

technologies in accordance with § 535.7(f)(2). Credit incentives for advanced technology engines do not apply during the Phase 2 period.

(9) *Useful life.* The exhaust emission standards of this section apply for the full useful life, expressed in service miles, operating hours, or calendar years, whichever comes first. The following useful life values apply for the standards of this section:

(i) 120,000 miles or 11 years, whichever comes first, for CI and SI LHD engines certified to Phase 1 standards.



(ii) 150,000 miles or 15 years, whichever comes first, for CI and SI LHD and spark-ignition engines certified to Phase 2 standards.

(iii) 185,000 miles or 10 years, whichever comes first, for CI MHD engines certified to Phase 1 and for Phase 2.

(iv) 435,000 miles or 10 years, whichever comes first, for CI HHD engines certified to Phase 1 and for Phase 2.

(v) For Phase 1 credits that manufacturers calculate based on a useful life of 110,000 miles, multiply any banked credits that it carries forward for use into the Phase 2 program by 1.36. For Phase 1 credit deficits that manufacturers generate based on a useful life of 110,000 miles multiply the credit deficit by 1.36, if offsetting the shortfall with Phase 2 credits.

(10) *Loose engines.* This paragraph (d)(10) describes alternate emission and fuel consumption standards for loose engines certified under. The standards of this paragraph (d) and 1036.108 do not apply for loose engines certified under paragraph (a) of this section and 40 CFR 86.1819-14(k)(8). The standards in 40 CFR 1036.150(j) apply for the emissions and equivalent fuel consumption measured with the engine installed in a complete vehicle consistent with the provisions of 40 CFR 86.1819-14(k)(8)(vi).

(11) *Alternate transition option for Phase 2 engine standards.* (i) Manufacturers may optionally elect to comply with the model year 2021 primary (Phase 2) vocational vehicle and tractor engine standards in paragraph (d)(3) of this section beginning in model year 2020 (*e.g.*, comply with the more stringent standards one year early). The model year 2021 standard would apply to these manufacturers for model years 2020 through 2023. Manufacturers that voluntarily certify their engines to model year 2021 standards early would then be eligible for less stringent engine tractor standards in model years 2024 through 2026, as follows:

(A) 5.3242 gallons per 100 hp-hr for MHD vocational vehicle engines.

(B) 4.5874 gallons per 100 hp-hr for MHD tractor engines.

(C) 5.0098 gallons per 100 hp-hr for HHD vocational vehicle engines.

(D) 4.3418 gallons per 100 hp-hr for HHD tractor engines.

(ii) The primary standard in paragraph (d)(3) of this section applies for all manufacturers in model year 2027 and later years.

(iii) Manufacturers may apply these provisions separately for medium

heavy-duty engines and heavy heavy-duty engines. This election applies to all engines in each segment. For example, if a manufacturer elects this alternate option for its medium heavy-duty engines, all of the manufacturer's medium heavy-duty vocational and tractor engines must comply. Engine fuel consumption credits generated under § 535.7(d) for manufacturers complying early with the model year 2021 standards follow the temporary extended credit life allowance in § 535.7(d)(9).

(12) *Compliance with standards.* A manufacturer complies with the standards of this part as described in § 535.10.

#### § 535.6 Measurement and calculation procedures.

This part describes the measurement and calculation procedures manufacturers use to determine annual fuel consumption performance results. Manufacturers use the fuel consumption results determined in this part for calculating credit balances specified in § 535.7 and then determine whether they comply with standards as specified in § 535.10. Manufacturers must use EPA emissions test results for deriving NHTSA's fuel consumption performance rates. Consequently, manufacturers conducting testing for certification or annual demonstration testing and providing CO<sub>2</sub> emissions data to EPA must also provide equivalent fuel consumption results to NHTSA for all values. NHTSA and EPA reserve the right to verify separately or in coordination the results of any testing and measurement established by manufacturers in complying with the provisions of this program and as specified in 40 CFR 1037.301 and § 535.9. Any carry over data from the Phase 1 program may be carried into the Phase 2 only with approval from EPA and by using good engineering judgment considering differences in testing protocols between test procedures.

(a) *Heavy-duty pickup trucks and vans.* This section describes the method for determining the fuel consumption performance rates for test groups and for fleets of complete heavy-duty pickup trucks and vans each model year. The NHTSA heavy-duty pickup truck and van fuel consumption performance rates correspond to the same requirements for EPA as specified in 40 CFR 86.1819-14.

(1) For the Phase 1 program, if the manufacturer's fleet includes conventional vehicles (gasoline, diesel and alternative fueled vehicles) and advanced technology vehicles (hybrids with powertrain designs that include energy storage systems, vehicles with

waste heat recovery, electric vehicles and fuel cell vehicles), it may divide its fleet into two separate fleets each with its own separate fleet average fuel consumption performance rate. For Phase 2, manufacturers may calculate their fleet average fuel consumption rates for a conventional fleet and separate advanced technology vehicle fleets. Advanced technology vehicle fleets should be separated into plug-in hybrid electric vehicles, electric vehicles and fuel cell vehicles.

(2) Vehicles in each fleet should be selected and divided into test groups or subconfigurations according to EPA in 40 CFR 86.1819-14(d).

(3) Use the EPA CO<sub>2</sub> emissions test results for each test group, in grams per mile, for the selected vehicles.

(i) Use CO<sub>2</sub> emissions test results for vehicles fueled by conventional and alternative fuels, including dedicated and dual-fueled (multi-fuel and flexible-fuel) vehicles using each fuel type as specified in 40 CFR 86.1819-14(d)(10).

(ii) Use CO<sub>2</sub> emissions test results for dual-fueled vehicles using a weighted average of the manufacturer's emission results as specified in 40 CFR 600.510-12(k) for light-duty trucks.

(iii) All electric vehicles are deemed to have zero emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O. No emission testing is required for such electric vehicles. Assign the fuel consumption test group result to a value of zero gallons per 100 miles in paragraph (a)(4) of this section.

(iv) Use CO<sub>2</sub> emissions test results for cab-complete and incomplete vehicles based upon the applicable complete sister vehicles as determined in 40 CFR 1819-14(j)(2).

(v) Use CO<sub>2</sub> emissions test results for loose engines using applicable complete vehicles as determined in 40 CFR 86.1819-14(k)(8).

(vi) Manufacturers can choose to analytically derive CO<sub>2</sub> emission rates (ADCs) for test groups or subconfigurations. Use ADCs for test groups or subconfigurations in accordance with 40 CFR 86.1819-14 (d) and (g).

(4) Calculate equivalent fuel consumption results for all test groups, in gallons per 100 miles, from CO<sub>2</sub> emissions test group results, in grams per miles, and round to the nearest 0.001 gallon per 100 miles.

(i) Calculate the equivalent fuel consumption test group results as follows for compression-ignition vehicles and alternative fuel compression-ignition vehicles. CO<sub>2</sub> emissions test group result (grams per mile)/10,180 grams per gallon of diesel fuel) × (10<sup>2</sup>) = Fuel consumption test group result (gallons per 100 mile).

(ii) Calculate the equivalent fuel consumption test group results as follows for spark-ignition vehicles and alternative fuel spark-ignition vehicles. CO<sub>2</sub> emissions test group result (grams per mile)/8,877 grams per gallon of

gasoline fuel) × (10<sup>2</sup>) = Fuel consumption test group result (gallons per 100 mile).

(5) Calculate the fleet average fuel consumption result, in gallons per 100 miles, from the equivalent fuel

consumption test group results and round the fuel consumption result to the nearest 0.001 gallon per 100 miles. Calculate the fleet average fuel consumption result using the following equation.

### Fleet Average Fuel Consumption

$$= \frac{\sum [Fuel\ Consumption\ Test\ Group\ Result_i \times Volume_i]}{\sum Volume_i}$$

Where:

Fuel Consumption Test Group Result<sub>i</sub> = fuel consumption performance for each test group as defined in 49 CFR 523.4.

Volume<sub>i</sub> = production volume of each test group.

(6) Compare the fleet average fuel consumption standard to the fleet average fuel consumption performance. The fleet average fuel consumption performance must be less than or equal to the fleet fuel consumption standard to comply with standards in § 535.5(a).

(b) *Heavy-duty vocational vehicles and tractors.* This section describes the method for determining the fuel consumption performance rates for vehicle families of heavy-duty vocational vehicles and tractors. The NHTSA heavy-duty vocational vehicle and tractor fuel consumption performance rates correspond to the same requirements for EPA as specified in 40 CFR 1037, subpart F.

(1) Select vehicles and vehicle family configurations as specified in 40 CFR 1037.150 and 1037.230 for vehicles that make up each of the manufacturer's regulatory subcategories of vocational vehicles and tractors. For the Phase 2 program, select powertrain, axle and transmission families in accordance with 40 CFR 1037.231 and 1037.232.

(2) Follow the EPA testing requirements in 40 CFR 1037.230 and 1037.501 to derive inputs for the Greenhouse gas Emissions Model (GEM).

(3) Enter inputs into GEM, in accordance with 40 CFR 1037.520, to derive the emissions and fuel consumption performance results for all vehicles (conventional, alternative fueled and advanced technology vehicles).

(4) For Phase 1 and 2, all of the following GEM inputs apply for vocational vehicles and other tractor regulatory subcategories, as follows:

(i) Model year and regulatory subcategory (see § 535.3 and 40 CFR 1037.230).

(ii) Coefficient of aerodynamic drag (C<sub>d</sub>A) or drag area, as described in 40

CFR 1037.520(b), 40 CFR 1037.525, 1037.527 and 1037.528. Alternatively, manufacturers may use C<sub>d</sub>A values as specified in 40 CFR 1037.530, 1037.532 or 1037.534 if used for determining CO<sub>2</sub> compliance for EPA. Manufacturers must use the same compliance approach for determining C<sub>d</sub>A values in GEM for the NHTSA and EPA programs.

(iii) Steer and drive tire rolling resistance, as described in 40 CFR 1037.520(c).

(iv) Vehicle speed limiters, as described in 40 CFR 1037.520(d) (tractors only).

(v) Vehicle weight reduction, as described in 40 CFR 1037.520(e) (tractors only for Phase 1).

(vi) Automatic engine shutdown systems, as described in 40 CFR 1037.660 (only for Phase 1 Class 8 sleeper cabs). For Phase 1, enter a GEM input value of 5.0 g/ton-mile, or an adjusted value as specified in 40 CFR 1037.660.

(5) For Phase 2 vehicles, the GEM inputs described in paragraphs (b)(4)(i) through (v) of this section continue to apply. Note that the provisions related to vehicle speed limiters and automatic engine shutdown systems are available for vocational vehicles in Phase 2. The additional GEM inputs that apply for vocational vehicles and other tractor regulatory subcategories for demonstrating compliance with Phase 2 standards are as follows:

(i) *Engine characteristics.* Enter information from the engine manufacturer to describe the installed engine and its operating parameters as described in 40 CFR 1036.503 and 1037.520(f).

(ii) *Vehicle information.* Enter information in accordance with 40 CFR 1037.520(g) for the vehicle and its operating parameters including:

(A) Transmission make, model and type;

(B) Drive axle configuration;

(C) Drive axle ratio, *ka*;

(D) For Phase 2, GEM inputs associated with powertrain testing include powertrain family, transmission

calibration identifier, test data from 40 CFR 1037.550 and 1037.551, and the powertrain test configuration (dynamometer connected to transmission output or wheel hub). Test Phase 1 hybrid systems according to 40 CFR 1037.555 to determine GEM inputs.

(iii) *Idle-reduction technologies.* Identify whether the manufacturer's vehicle has qualifying idle-reduction technologies, subject to the qualifying criteria in 40 and 1037.660 and enter values for stop start and neutral idle technologies as specified in 40 CFR 1037.520(h).

(iv) *Axle and transmission efficiency.* Manufacturers may use axle efficiency maps as described in 40 CFR 1037.560 and transmission efficiency maps as described in 40 CFR 1037.565 to replace the default values in GEM.

(v) *Additional reduction technologies.* Enter input values in GEM as follows to characterize the percentage CO<sub>2</sub> emission reduction corresponding to certain technologies and vehicle configurations, or enter 0 as specified in 40 CFR 1037.520(j):

(A) Intelligent controls

(B) Accessory load

(C) Tire-pressure systems

(D) Extended-idle reduction

(E) Additional GEM inputs may apply as follows:

(1) Enter 1.7 and 0.9, respectively, for school buses and coach buses that have at least seven available forward gears.

(2) If the agencies approve an off-cycle technology under § 535.7(f) and 40 CFR 1037.610 in the form of an improvement factor, enter the improvement factor expressed as a percentage reduction in CO<sub>2</sub> emissions. (Note: In the case of approved off-cycle technologies whose benefit is quantified as a g/ton-mile credit, apply the credit to the GEM result, not as a GEM input value.)

(3) Manufacturers may use values to characterize torque converters as inputs to GEM as specified in the procedure defined in 40 CFR 1037.570.

(4) Vocational vehicle manufacturers may optionally use values for neutral coasting in GEM as in 40 CFR 1037.520

(vi) *Vehicles with hybrid power take-off (PTO)*. For vocational vehicles, determine the delta PTO emission result of the manufacturer's engine and hybrid power take-off system as described in 40 CFR 1037.540.

(vii) *Aerodynamic improvements for vocational vehicles*. For vocational vehicles certified using the Regional duty cycle, enter  $\Delta C_d$  values to account for using rear fairings and a reduced minimum frontal area as specified in 40 CFR 1037.520(m) and 1037.527.

(viii) *Alternate fuels*. For fuels other than those identified in GEM, perform the simulation by identifying the vehicle as being diesel-fueled if the engine is subject to the compression-ignition standard, or as being gasoline-fueled if the engine is subject to the spark-ignition standards. Correct the engine or powertrain fuel map for mass-specific net energy content as described in 40 CFR 1036.535(b).

(ix) *Custom Chassis Vehicles*. A simplified version of GEM applies for custom chassis vehicle subject § 535.5(b)(6) in accordance with 40 CFR 1037.520(a)(2)(ii).

(6) In unusual circumstances, manufacturers may ask EPA to use weighted average results of multiple GEM runs to represent special technologies for which no single GEM run can accurately reflect.

(7) From the GEM results, select the CO<sub>2</sub> family emissions level (FEL) and equivalent fuel consumption values for vocational vehicle and tractor families in each regulatory subcategory for each model year. Equivalent fuel consumption FELs are derived in GEM and expressed to the nearest 0.0001 gallons per 1000 ton-mile. For families containing multiple subfamilies, identify the FELs for each subfamily.

(8) The fuel consumption of electric vehicles (as defined in § 1037.801) are deemed to be zero. No emission testing is required for electric vehicles. Use good engineering judgment to apply other requirements of this part to electric vehicles.

(c) [Reserved]

(d) *Heavy-duty engines*. This section describes the method for determining equivalent fuel consumption family certification level (FCL) values for engine and powertrain families and subfamilies of heavy-duty truck tractors and vocational vehicles. The NHTSA heavy-duty engine fuel consumption FCLs are determined from the EPA FCLs tested in accordance with 40 CFR 1036, subpart F. Each engine and powertrain family must use the same primary intended service class as designated for EPA in accordance with 40 CFR 1036.140.

(1) Manufacturers must select emission-data engines representing the tested configuration of each engine family specified in 40 CFR 1036.501 for engines in heavy-duty truck tractors and vocational vehicles that make up each of the manufacturer's regulatory subcategories.

(2) Standards in § 535.5(d) apply to the CO<sub>2</sub> emissions rates for each emissions-data engine in an engine or powertrain family subject to the procedures and equipment specified in 40 CFR part 1036, subpart F. Determine equivalent fuel consumption rates using CO<sub>2</sub> emissions rates in grams per hp-hr measured to at least one more decimal place than that of the applicable EPA standard in 40 CFR 1036.108.

(i) Use the CO<sub>2</sub> emissions test results for engines running on each fuel type for conventional, dedicated, multi-fueled (dual-fuel, and flexible-fuel) engines as specified in 40 CFR part 1036, subpart F.

(ii) Use the CO<sub>2</sub> emissions result for multi-fueled engines using the same weighted fuel mixture emission results as specified in 40 CFR 1036.235 and 40 CFR part 1036, subpart F.

(iii) Use the CO<sub>2</sub> emissions test results for hybrid engines as described in 40 CFR 1036.525.

(iv) All electric vehicles are deemed to have zero emissions of CO<sub>2</sub> and zero fuel consumption. No emission or fuel consumption testing is required for such electric vehicles.

(3) Use the CO<sub>2</sub> emissions test results for medium and heavy heavy-duty engines certified as tractor and other line haul engine families using the steady-state duty cycle specified in § 1036.501 (referred to as the Supplementary Emissions Test, or SET) and as both tractor and vocational engines using the steady-state duty cycle and the transient duty cycle (sometimes referred to as the FTP engine cycle)-for each model year. Use the CO<sub>2</sub> emissions test results for all other engines (including engines meeting spark-ignition standards) using the appropriate transient duty cycle specified in 40 CFR 1036.501.

(i) If a manufacturer certifies an engine family for use both as a vocational engine and as a tractor engine, the manufacturer must split the family into two separate subfamilies in accordance with 40 CFR 1036.230. The manufacturer may assign the numbers and configurations of engines within the respective subfamilies at any time prior to the submission of the end-of-year report required by 40 CFR 1036.730 and § 535.8. The manufacturer must track into which type of vehicle each engine

is installed, although EPA may allow the manufacturer to use statistical methods to determine this for a fraction of its engines.

(ii) The following engines are excluded from the engine and powertrain families and subfamilies used to determine fuel consumption FCL values and the benefit for these engines is determined as an advanced technology credit under the ABT provisions provided in § 535.7(e); these provisions apply only for the Phase 1 program:

(A) Engines certified as hybrid engines or power packs.

(B) Engines certified as hybrid engines designed with PTO capability and that are sold with the engine coupled to a transmission.

(C) Engines with Rankine cycle waste heat recovery.

(4) Manufacturers generating CO<sub>2</sub> emissions rates to demonstrate compliance to EPA vehicle standards for model years 2021 and later, using engine fuel maps determined in accordance with 40 CFR 1036.535 and 1036.540 or engine powertrain results in accordance with 40 CFR 1036.630 and 40 CFR 1037.550 for each engine configuration, must use the same compliance pathway and model years for certifying under the NHTSA program. Manufacturers may omit providing equivalent fuel consumption FCLs under this section if all of its engines will be installed in vehicles that are certified based on powertrain testing as described in 40 CFR 1037.550.

(5) Calculate equivalent fuel consumption values from the emissions CO<sub>2</sub> FCLs levels for certified engines, in gallons per 100 hp-hr and round each fuel consumption value to the nearest 0.0001 gallon per 100 hp-hr.

(i) Calculate equivalent fuel consumption FCL values for compression-ignition engines and alternative fuel compression-ignition engines. CO<sub>2</sub> FCL value (grams per hp-hr)/10,180 grams per gallon of diesel fuel) × (10<sup>2</sup>) = Fuel consumption FCL value (gallons per 100 hp-hr).

(ii) Calculate equivalent fuel consumption FCL values for spark-ignition engines and alternative fuel spark-ignition engines. CO<sub>2</sub> FCL value (grams per hp-hr)/8,877 grams per gallon of gasoline fuel) × (10<sup>2</sup>) = Fuel consumption FCL value (gallons per 100 hp-hr).

(iii) Manufacturers may carryover fuel consumption data from a previous model year if allowed to carry over emissions data for EPA in accordance with 40 CFR 1036.235.

(iv) If a manufacturer uses an alternate test procedure under 40 CFR 1065.10

and subsequently the data is rejected by EPA, NHTSA will also reject the data.

**§ 535.7 Averaging, banking, and trading (ABT) credit program.**

(a) General provisions. After the end of each model year, manufacturers must comply with the fuel consumption standards in § 535.5 for averaging, banking and trading credits.

Manufacturers comply with standards if the sum of averaged, banked and traded credits generate a “zero” credit balance or a credit surplus within an averaging set of vehicles or engines.

Manufacturers fail to comply with standards if the sum of the credit flexibilities generate a credit deficit (or shortfall) in an averaging set. Credit shortfalls must be offset by banked or traded credits within three model years after the shortfall is incurred. These processes are hereafter referenced as the NHTSA ABT credit program. The following provisions apply to all fuel consumption credits.

(1) *Credits (or fuel consumption credits (FCCs))*. Credits in this part mean a calculated weighted value representing the difference between the fuel consumption performance and the standard of a vehicle or engine family or fleet within a particular averaging set. Positive credits represent cases where a vehicle or engine family or fleets perform better than the applicable standard (the fuel consumption performance is less than the standard) whereas negative credits represent underperforming cases. The value of a credit is calculated according to paragraphs (b) through (e) of this section. FCCs are only considered earned or useable for averaging, banking or trading after EPA and NHTSA have verified the information in a manufacturer’s final reports required in § 535.8. Types of FCCs include the following:

(i) *Conventional credits*. Credits generated by vehicle or engine families or fleets containing conventional vehicles (*i.e.*, gasoline, diesel and alternative fueled vehicles).

(ii) *Early credits*. Credits generated by vehicle or engine families or fleets produced for model year 2013. Early credits are multiplied by an incentive factor of 1.5 times.

(iii) *Advanced technology credits*. Credits generated by vehicle or engine families or subconfigurations containing vehicles with advanced technologies (*i.e.*, hybrids with regenerative braking, vehicles equipped with Rankine-cycle engines, electric and fuel cell vehicles) and incentivized under this ABT credit program in paragraph (f)(1) of this section and by EPA under 40 CFR

86.1819–14(d)(7), 1036.615, and 1037.615.

(iv) *Innovative and off-cycle technology credits*. Credits can be generated by vehicle or engine families or subconfigurations having fuel consumption reductions resulting from technologies not reflected in the GEM simulation tool or in the FTP chassis dynamometer and that were not in common use with heavy-duty vehicles or engines before model year 2010 that are not reflected in the specified test procedure. Manufacturers should prove that these technologies were not in common use in heavy-duty vehicles or engines before model year 2010 by demonstrating factors such as the penetration rates of the technology in the market. NHTSA will not approve any request if it determines that these technologies do not qualify. The approach for determining innovative and off-cycle technology credits under this fuel consumption program is described in paragraph (f)(2) of this section and by EPA under 40 CFR 86.1819–14(d)(13), 1036.610, and 1037.610.

(2) *Averaging*. Averaging is the summing of a manufacturer’s positive and negative FCCs for engines or vehicle families or fleets within an averaging set. The principle averaging sets are defined in § 535.4.

(i) A credit surplus occurs when the net sum of the manufacturer’s generated credits for engines or vehicle families or fleets within an averaging set is positive (a zero-credit balance is when the sum equals zero).

(ii) A credit deficit occurs when the net sum of the manufacturer’s generated credits for engines or vehicle families or fleets within an averaging set is negative.

(iii) Positive credits, other than advanced technology credits, generated and calculated within an averaging set may only be used to offset negative credits within the same averaging set.

(iv) Manufacturers may certify one or more vehicle families (or subfamilies) to an FEL above the applicable fuel consumption standard, subject to any applicable FEL caps and other provisions allowed by EPA in 40 CFR parts 1036 and 1037, if the manufacturer shows in its application for certification to EPA that its projected balance of all FCC transactions in that model year is greater than or equal to zero or that a negative balance is allowed by EPA under 40 CFR 1036.745 and 1037.745.

(v) If a manufacturer certifies a vehicle family to an FEL that exceeds the otherwise applicable standard, it must obtain enough FCC to offset the vehicle family’s deficit by the due date

of its final report required in § 535.8. The emission credits used to address the deficit may come from other vehicle families that generate FCCs in the same model year (or from the next three subsequent model years), from banked FCCs from previous model years, or from FCCs generated in the same or previous model years that it obtained through trading.

(vi) Manufacturers may certify a vehicle or engine family using an FEL (as described in § 535.6) below the fuel consumption standard (as described in § 535.5) and choose not to generate conventional fuel consumption credits for that family. Manufacturers do not need to calculate fuel consumption credits for those families and do not need to submit or keep the associated records described in § 535.8 for these families. Manufacturers participating in NHTSA’s FCC program must provide reports as specified in § 535.8.

(3) *Banking*. Banking is the retention of surplus FCC in an averaging set by the manufacturer for use in future model years for the purpose of averaging or trading.

(i) Surplus credits may be banked by the manufacturer for use in future model years, or traded, given the restriction that the credits have an expiration date of five model years after the year in which the credits are generated. For example, banked credits earned in model year 2014 may be utilized through model year 2019. Surplus credits will become banked credits unless a manufacturer contacts NHTSA to expire its credits.

(ii) Surplus credits become earned or usable banked FCCs when the manufacturer’s final report is approved by both agencies. However, the agencies may revoke these FCCs at any time if they are unable to verify them after reviewing the manufacturer’s reports or auditing its records.

(iii) Banked FCC retain the designation from the averaging set and model year in which they were generated.

(iv) Banked credits retain the designation of the averaging set in which they were generated.

(4) *Trading*. Trading is a transaction that transfers banked family regulatory subcategory or averaging set fuel consumption credits. Tractor, vocational vehicle and engine manufacturers may trade credits generated for vehicle or engine families or subfamilies while manufacturers of heavy-duty pickup trucks and vans certified as complete vehicles may trade credit credits generated for averaging sets. A manufacturer may use traded FCCs for

averaging, banking, or further trading transactions.

(i) Manufacturers may only trade banked credits to other manufacturers to use for compliance with fuel consumption standards. Traded FCCs, other than advanced technology credits, may be used only within the averaging set in which they were generated. Manufacturers may only trade credits to other entities for the purpose of expiring credits.

(ii) Advanced technology credits can be traded across different averaging sets.

(iii) The agencies may revoke traded FCCs at any time if they are unable to verify them after reviewing the manufacturer's reports or auditing its records.

(iv) If a negative FCC balance results from a transaction, both the buyer and seller are liable, except in cases the agencies deem to involve fraud. See § 535.9 for cases involving fraud. EPA also may suspend, revoke or void the certificates of all vehicle families participating in a trade that results in a manufacturer having a negative balance of emission credits. See 40 CFR 1037.745 and § 535.3(j).

(v) Manufacturers with deficits or projecting deficits before or during a production model year may not trade credits until its available credits exceed the deficit. Manufacturers with a deficit may not trade credits if the deadline to offset that credit deficit has passed.

(5) *Credit deficit (or credit shortfall)*. A credit shortfall or deficit occurs when the sum of the manufacturer's generated credits for engines or vehicle families or fleets within an averaging set is negative. Credit shortfalls must be offset by an available credit surplus within three model years after the shortfall was incurred. If the shortfall cannot be offset, the manufacturer is liable for civil penalties as discussed in § 535.9.

(6) *FCC credit plan*. (i) Each model year manufacturers submit credit plan in their certificates of conformity as required in 40 CFR 1036.725(b)(2) and 40 CFR 1037.725(b)(2). The plan is required to contain equivalent fuel consumption information in accordance § 535.8(c). The plan must include:

(A) Detailed calculations of projected emission and fuel consumption credits (positive or negative) based on projected U.S.-directed production volumes. The agencies may require a manufacturer to include similar calculations from its other engine or vehicle families to project its net credit balances for the model year. If a manufacturer projects negative emission and/or fuel consumption credits for a family, it must state the source of positive emission and/or fuel consumption

credits it expects to use to offset the negative credits demonstrating how it plans to resolve any credit deficits that might occur for a model year within a period of up to three model years after that deficit has occurred.

(B) Actual emissions and fuel consumption credit balances, credit transactions, and credit trades.

(i) Manufacturers are required to provide updated credit plans after receiving their final verified reports from EPA and NHTSA after the end of each model year.

(ii) The agencies may determine that a manufacturer's plan is unreasonable or unrealistic based on a consideration of past and projected use of specific technologies, the historical sales mix of its vehicle models, subsequent failure to follow any submitted plans, and limited expected access to traded credits.

(iii) The agencies may also consider the plan unreasonable if the manufacturer's credit deficit increases from one model year to the next. The agencies may require that the manufacturers must send interim reports describing its progress toward resolving its credit deficit over the course of a model year.

(iv) If NHTSA determines that a manufacturers plan is unreasonable or unrealistic, the manufacturer is deemed as not comply with fuel consumption standards as specified in § 535.10(c) and the manufacturer may be liable for civil penalties.

(7) *Revoked credits*. NHTSA may revoke fuel consumption credits if unable to verify any information after auditing reports or records or conducting confirmatory testing. In the cases where EPA revokes emissions CO<sub>2</sub> credits, NHTSA will revoke the equivalent amount of fuel consumption credits.

(8) *Transition to Phase 2 standards*. The following provisions allow for enhanced use of fuel consumption credits from Phase 1 tractors and vocational vehicles for meeting the Phase 2 standards:

(i) Fuel consumption credits a manufacturer generates for light and medium heavy-duty vocational vehicles in model years 2018 through 2021 may be used through model year 2027, instead of being limited to a five-year credit life as specified in this part.

(ii) The manufacturer may use the off-cycle provisions of paragraph (f) of this section to apply technologies to Phase 1 vehicles as follows:

(A) A manufacturer may apply an improvement factor of 0.988 for tractors and vocational vehicles with automatic tire inflation systems on all axles.

(B) For vocational vehicles with automatic engine shutdown systems that conform with 40 CFR 1037.660, a manufacturer may apply an improvement factor of 0.95.

(C) For vocational vehicles with stop-start systems that conform with 40 CFR 1037.660, a manufacturer may apply an improvement factor of 0.92.

(D) For vocational vehicles with neutral-idle systems conforming with 40 CFR 1037.660, manufacturers may apply an improvement factor of 0.98. Manufacturers may adjust this improvement factor if we approve a partial reduction under 40 CFR 1037.660(a)(2); for example, if the manufacturer's design reduces fuel consumption by half as much as shifting to neutral, it may apply an improvement factor of 0.99.

(9) *Credits for small business manufacturers*. Small manufacturers may generate fuel consumption credits for natural gas-fueled vocational vehicles as follows:

(i) Small manufacturers may certify their vehicles instead of relying on the exemption of § 535.3.

(ii) Use Phase 1 GEM to determine a fuel consumption level for vehicle, then multiply this value by the engine's FCL for fuel consumption and divide by the engine's applicable fuel consumption standard.

(iii) Use the value determined in paragraph (a)(ii) of this section in the credit equation specified in paragraph (c) of this section in place of the term (Std -FEL)

(iv) The following provisions apply uniquely to small businesses under the custom-chassis standards of § 535.5(b)(6):

(A) Manufacturers may use fuel consumption credits generated under paragraph (c) of this section, including banked or traded credits from any averaging set. Such credits remain subject to other limitations that apply under this part.

(B) Manufacturers may produce up to 200 drayage tractors in a given model year to the standards described in § 535.5(b)(6) for "other buses". Treat these drayage tractors as being in their own averaging set. This limit applies with respect to vehicles produced by the parent manufacturer and its owned subordinate companies.

(10) *Certifying non-gasoline engines*. A manufacturer producing non-gasoline engines complying with model year 2021 or later medium heavy-duty spark-ignition standards may not generate fuel consumption credits. Only manufacturers producing gasoline engines certifying to spark-ignition standards can generate fuel

consumption credits under paragraph (d) of this section.

(11) Unless the regulations explicitly allow it, manufacturers may not calculate Phase 1 fuel consumption credits more than once for compliance. For example, if a manufacturer generates Phase 1 fuel consumption credits for a given hybrid vehicle under this part, no one may generate fuel consumption credits for the associated hybrid engine under 40 CFR part 1036. However, Phase 1 credits could be generated for identical engines used in vehicles that did not generate engine credits.

(b) *ABT provisions for heavy-duty pickup trucks and vans.* (1) Calculate fuel consumption credits in a model year for one fleet of conventional heavy-duty pickup trucks and vans and if designated by the manufacturer another consisting of advance technology vehicles for the averaging set as defined in § 535.4. Calculate credits for each fleet separately using the following equation:

$$\text{Total MY Fleet FCC (gallons)} = (\text{Std} - \text{Act}) \times (\text{Volume}) \times (\text{UL}) \times (10^2)$$

Where:

Std = Fleet average fuel consumption standard (gal/100 mile).

Act = Fleet average actual fuel consumption value (gal/100 mile).

Volume = the total U.S.-directed production of vehicles in the regulatory subcategory.

UL = the useful life for the regulatory subcategory.

The useful life value for heavy-duty pickup trucks and vans manufactured for model years 2013 through 2020 is equal to the 120,000 miles. The useful life for model years 2021 and later is equal to 150,000 miles.

(2) Adjust the fuel consumption performance of subconfigurations with advanced technology for determining the fleet average actual fuel consumption value as specified in paragraph (f)(1) of this section and 40 CFR 86.1819–14(d)(7). Advanced technology vehicles can be separated in a different fleet for the purpose of applying credit incentives as described in paragraph (f)(1) of this section.

(3) Adjust the fuel consumption performance for subconfigurations with

innovative technology. A manufacturer is eligible to increase the fuel consumption performance of heavy-duty pickup trucks and vans in accordance with procedures established by EPA set forth in 40 CFR part 600. The eligibility of a manufacturer to increase its fuel consumption performance through use of an off-cycle technology requires an application request made to EPA and NHTSA in accordance with 40 CFR 86.1869–12 and an approval granted by the agencies. For off-cycle technologies that are covered under 40 CFR 86.1869–12, NHTSA will collaborate with EPA regarding NHTSA’s evaluation of the specific off-cycle technology to ensure its impact on fuel consumption and the suitability of using the off-cycle technology to adjust fuel consumption performance. NHTSA will provide its views on the suitability of the technology for that purpose to EPA. NHTSA will apply the criteria in paragraph (f)(2) of this section in granting or denying off-cycle requests.

(4) Fuel consumption credits may be generated for vehicles certified in model year 2013 to the model year 2014 standards in § 535.5(a). If a manufacturer chooses to generate CO<sub>2</sub> emission credits under EPA’s provisions in 40 CFR part 86, it may also voluntarily generate early credits under the NHTSA fuel consumption program. To do so, a manufacturer must certify its entire U.S.-directed production volume of vehicles in its fleet. The same production volume restrictions specified in 40 CFR 1037.150(a)(2) relating to when test groups are certified apply to the NHTSA early credit provisions. Credits are calculated as specified in paragraph (b)(3) of this section relative to the fleet standard that would apply for model year 2014 using the model year 2013 production volumes. Surplus credits generated under this paragraph (b)(4) are available for banking or trading. Credit deficits for an averaging set prior to model year 2014 do not carry over to model year 2014. These credits may be used to show compliance with the standards of this part for 2014 and later model years. Once a manufacturer opts into the NHTSA program, they must stay in the

program for all of the optional model years and remain standardized with the same implementation approach being followed to meet the EPA CO<sub>2</sub> emission program.

(5) Calculate the averaging set credit value by summing together the fleet credits for conventional and advanced technology vehicles including any adjustments for innovative technologies. Manufacturers may sum conventional and innovative technology credits before adding any advanced technology credits in each averaging set.

(6) For credits that manufacturers calculate based on a useful life of 120,000 miles, multiply any banked credits carried forward for use in model year 2021 and later by 1.25. For credit deficits that a manufacturer calculates based on a useful life of 120,000 miles and that it offsets with credits originally earned in model year 2021 and later, it multiplies the credit deficit by 1.25.

(c) *ABT provisions for vocational vehicles and tractors.* (1) Calculate the fuel consumption credits in a model year for each participating family or subfamily consisting of conventional vehicles in each averaging set (as defined in § 535.4) using the equation in this section. Each designated vehicle family or subfamily has a “family emissions limit” (FEL) that is compared to the associated regulatory subcategory standard. An FEL that falls below the regulatory subcategory standard creates “positive credits,” while fuel consumption level of a family group above the standard creates a “negative credits.” The value of credits generated for each family or subfamily in a model year is calculated as follows and must be rounded to nearest whole number:

$$\text{Vehicle Family FCC (gallons)} = (\text{Std} - \text{FEL}) \times (\text{Payload}) \times (\text{Volume}) \times (\text{UL}) \times (10^3)$$

Where:

Std = the standard for the respective vehicle family regulatory subcategory (gal/1000 ton-mile).

FEL = family emissions limit for the vehicle family (gal/1000 ton-mile).

Payload = the prescribed payload in tons for each regulatory subcategory as shown in the following table:

Regulatory subcategory	Payload (tons)
Vocational LHD Vehicles .....	2.85
Vocational MHD Vehicles .....	5.60
Vocational HHD Vehicles .....	7.5
MDH MHD Tractors .....	12.50
HHD Tractors, other than heavy-haul Tractors .....	19.00
Heavy-haul Tractors .....	43.00

Volume = the number of U.S.-directed production volume of vehicles in the corresponding vehicle family.

UL = the useful life for the regulatory subcategory (miles) as shown in the following table:

Regulatory subcategory	UL (miles)
LHD Vehicles .....	110,000 (Phase 1). 150,000 (Phase 2).
Vocational MHD Vehicles and tractors at or below 33,000 pounds GVWR .....	185,000.
Vocation HHD Vehicles and tractors at or above 33,000 pounds GVWR .....	435,000.

(i) Calculate the value of credits generated in a model year for each family or subfamily consisting of vehicles with advanced technology vehicles in each averaging set using the equation above and the guidelines provided in paragraph (f)(1) of this section. Manufacturers may generate credits for advanced technology vehicles using incentives specified in paragraph (f)(1) of this section.

(ii) Calculate the value of credits generated in a model year for each family or subfamily consisting of vehicles with off-cycle technology vehicles in each averaging set using the equation above and the guidelines provided in paragraph (f)(2) of this section.

(2) Manufacturers must sum all negative and positive credits for each vehicle family within each applicable averaging set to obtain the total credit balance for the model year before rounding. The sum of fuel consumptions credits must be rounded to the nearest gallon. Calculate the total credits generated in a model year for each averaging set using the following equation:

$$\text{Total averaging set MY credits} = \Sigma \text{ Vehicle family credits within each averaging set}$$

(3) Manufacturers can sum conventional and innovative technology credits before adding any advanced technology credits in each averaging set.

(4) If a manufacturer chooses to generate CO<sub>2</sub> emission credits under EPA provisions of 40 CFR 1037.150(a), it may also voluntarily generate early credits under the NHTSA fuel consumption program as follows:

(i) Fuel consumption credits may be generated for vehicles certified in model year 2013 to the model year 2014 standards in § 535.5(b) and (c). To do so, a manufacturer must certify its entire U.S.-directed production volume of vehicles. The same production volume restrictions specified in 40 CFR 1037.150(a)(1) relating to when test groups are certified apply to the NHTSA early credit provisions. Credits are calculated as specified in paragraph (c)(11) of this section relative to the standards that would apply for model

year 2014. Surplus credits generated under this paragraph (c)(4) may be increased by a factor of 1.5 for determining total available credits for banking or trading. For example, if a manufacturer has 10 gallons of surplus credits for model year 2013, it may bank 15 gallons of credits. Credit deficits for an averaging set prior to model year 2014 do not carry over to model year 2014. These credits may be used to show compliance with the standards of this part for 2014 and later model years. Once a manufacturer opts into the NHTSA program they must stay in the program for all of the optional model years and remain standardized with the same implementation approach being followed to meet the EPA CO<sub>2</sub> emission program.

(ii) A tractor manufacturer may generate fuel consumption credits for the number of additional SmartWay designated tractors (relative to its MY 2012 production), provided that credits are not generated for those vehicles under paragraph (c)(4)(i) of this section. Calculate credits for each regulatory sub-category relative to the standard that would apply in model year 2014 using the equations in paragraph (c)(2) of this section. Use a production volume equal to the number of verified model year 2013 SmartWay tractors minus the number of verified model year 2012 SmartWay tractors. A manufacturer may bank credits equal to the surplus credits generated under this paragraph multiplied by 1.50. A manufacturer's 2012 and 2013 model years must be equivalent in length. Once a manufacturer opts into the NHTSA program they must stay in the program for all of the optional model years and remain standardized with the same implementation approach being followed to meet the EPA CO<sub>2</sub> emission program.

(5) If a manufacturer generates credits from vehicles certified for advanced technology in accordance with paragraph (e)(1) of this section, a multiplier of 1.5 can be used, but this multiplier cannot be used on the same credits for which the early credit multiplier is used.

(6) For model years 2012 and later, manufacturers may generate or use fuel consumption credits for averaging to demonstrate compliance with the alternative standards as described in § 535.5(b)(6) of this part. Manufacturers can specify a Family Emission Limit (FEL) for fuel consumption for each vehicle subfamily. The FEL may not be less than the result of emissions and fuel consumption modeling as described in 40 CFR 1037.520 and § 535.6. These FELs serve as the fuel consumption standards for the vehicle subfamily instead of the standards specified in this § 535.5(b)(6). Manufacturers may not use averaging for motor homes, coach buses, emergency vehicles or concrete mixers meeting standards under § 535.5(b)(5).

(7) Manufacturers may not use averaging for vehicles meeting standards § 535.5(b)(6)(iv) through (vi), and manufacturers may not use fuel consumption credits for banking or trading for any vehicles certified under § 535.5(b)(6).

(8) Manufacturers certifying any vehicles under § 535.5(b)(6) must consider each separate vehicle type (or group of vehicle types) as a separate averaging set.

(d) ABT provisions for heavy-duty engines. (1) Calculate the fuel consumption credits in a model year for each participating family or subfamily consisting of engines in each averaging set (as defined in § 535.4) using the equation in this section. Each designated engine family has a "family certification level" (FCL) which is compared to the associated regulatory subcategory standard. A FCL that falls below the regulatory subcategory standard creates "positive credits," while fuel consumption level of a family group above the standard creates a "credit shortfall." The value of credits generated in a model year for each engine family or subfamily is calculated as follows and must be rounded to nearest whole number:

$$\text{Engine Family FCC (gallons)} = (\text{Std} - \text{FCL}) \times (\text{CF}) \times (\text{Volume}) \times (\text{UL}) \times (10^2)$$

Where:



Std = the standard for the respective engine regulatory subcategory (gal/100 hp-hr).  
 FCL = family certification level for the engine family (gal/100 hp-hr).  
 CF= a transient cycle conversion factor in hp-hr/mile which is the integrated total cycle horsepower-hour divided by the

equivalent mileage of the applicable test cycle. For engines subject to spark-ignition heavy-duty standards, the equivalent mileage is 6.3 miles. For engines subject to compression-ignition heavy-duty standards, the equivalent mileage is 6.5 miles.

Volume = the number of engines in the corresponding engine family.  
 UL = the useful life of the given engine family (miles) as shown in the following table:

Regulatory subcategory	UL (miles)
SI and CI LHD Engines .....	120,000 (Phase 1). 150,000 (Phase 2).
CI MHD Engines .....	185,000.
CI HDD Engines .....	435,000.

(i) Calculate the value of credits generated in a model year for each family or subfamily consisting of engines with advanced technology vehicles in each averaging set using the equation above and the guidelines provided in paragraph (f)(1) of this section. Manufacturers may generate credits for advanced technology vehicles using incentives specified in paragraph (f)(1) of this section.

(ii) Calculate the value of credits generated in a model year for each family or subfamily consisting of engines with off-cycle technology vehicles in each averaging set using the equation above and the guidelines provided in paragraph (f)(2) of this section.

(2) Manufacturers shall sum all negative and positive credits for each engine family within the applicable averaging set to obtain the total credit balance for the model year before rounding. The sum of fuel consumptions credits should be rounded to the nearest gallon.

Calculate the total credits generated in a model year for each averaging set using the following equation:

$$\text{Total averaging set MY credits} = \Sigma \text{ Engine family credits within each averaging set}$$

(3) The provisions of this section apply to manufacturers utilizing the compression-ignition engine voluntary alternate standard provisions specified in § 535.5(d)(4) as follows:

(i) Manufacturers may not certify engines to the alternate standards if they are part of an averaging set in which they carry a balance of banked credits. For purposes of this section, manufacturers are deemed to carry credits in an averaging set if they carry credits from advance technology that are allowed to be used in that averaging set.

(ii) Manufacturers may not bank fuel consumption credits for any engine family in the same averaging set and model year in which it certifies engines to the alternate standards. This means a manufacturer may not bank advanced

technology credits in a model year it certifies any engines to the alternate standards.

(iii) Note that the provisions of paragraph (d)(10) of this section apply with respect to credit deficits generated while utilizing alternate standards.

(4) Where a manufacturer has chosen to comply with the EPA alternative compression-ignition engine phase-in standard provisions in 40 CFR 1036.150(e), and has optionally decided to follow the same path under the NHTSA fuel consumption program, it must certify all of its model year 2013 compression-ignition engines within a given averaging set to the applicable alternative standards in § 535.5(d)(5). Engines certified to these standards are not eligible for early credits under paragraph (d)(14) of this section. Credits are calculated using the same equation provided in paragraph (d)(11) of this section.

(5) If a manufacturer chooses to generate early CO<sub>2</sub> emission credits under EPA provisions of 40 CFR 1036.150, it may also voluntarily generate early credits under the NHTSA fuel consumption program. Fuel consumption credits may be generated for engines certified in model year 2013 (2015 for spark-ignition engines) to the standards in § 535.5(d). To do so, a manufacturer must certify its entire U.S.-directed production volume of engines except as specified in 40 CFR 1036.150(a)(2). Credits are calculated as specified in paragraph (d)(11) of this section relative to the standards that would apply for model year 2014 (2016 for spark-ignition engines). Surplus credits generated under this paragraph (d)(3) may be increased by a factor of 1.5 for determining total available credits for banking or trading. For example, if a manufacturer has 10 gallons of surplus credits for model year 2013, it may bank 15 gallons of credits. Credit deficits for an averaging set prior to model year 2014 (2016 for spark-ignition engines) do not carry over to model year 2014 (2016 for spark-ignition engines). These

credits may be used to show compliance with the standards of this part for 2014 and later model years. Once a manufacturer opts into the NHTSA program they must stay in the program for all of the optional model years and remain standardized with the same implementation approach being followed to meet the EPA CO<sub>2</sub> emission program.

(6) Manufacturers may generate fuel consumption credits from an engine family subject to spark-ignition standards for exchanging with other engine families only if the engines in the family are gasoline-fueled.

(7) Engine credits generated for compression-ignition engines in the 2020 and earlier model years may be used in model year 2021 and later as follows:

(i) For credit-generating engines certified to the tractor engine standards in § 535.5(d), you may use credits calculated relative to the tractor engine standards.

(ii) For credit-generating engines certified to the vocational engine standards in § 535.5(d), you may use credits calculated relative to the following fuel consumption levels:

(A) Medium Heavy-Duty Engines = 5.4813 gallons/100 hp-hr.

(B) Heavy Heavy-Duty Engines = 5.1572 gallons/100 hp-hr.

(C) To transfer Phase 1 credits for use in the Phase 2 fuel consumption program, manufacturers must recalculate credit values for the Phase 1 model years by substituting the standards in paragraphs (d)(7)(ii)(A) and (B) of this section in the credit equation specified in § 535.5(d)(1).

(8) Engine families manufacturers certify with a nonconformance penalty under 40 CFR part 86, subpart L, and may not generate fuel consumption credits.

(9) *Alternate transition option for Phase 2 engine standards.* The following provisions allow for enhanced generation and use of fuel consumption credits for manufacturers complying

with engines standards in accordance with § 535.7(d)(11):

(i) If a manufacturer is eligible to certify all of its model year 2020 engines within the averaging set to the tractor and vocational vehicle engine standards in § 535.5(d)(11) and the requirements applicable to model year 2021 engines, the banked and traded fuel consumption credits generated for model year 2018 through 2024 engines may be used through model year 2030 as specified in paragraph (d)(9)(ii) of this section or through a five-year credit life, whichever is later.

(ii) Banked and traded fuel consumption credits generated under this paragraph (d)(9) for model year 2018 through 2024 engines may be used through model year 2030 with the extended credit life values shown in the table:

Model year	Credit life for transition option for Phase 2 engine standards (years)
2018 .....	12
2019 .....	11
2020 .....	10
2021 .....	9
2022 .....	8
2023 .....	7
2024 .....	6
2025 and later .....	5

(e) *Additional credit provisions.*

(1) *Advanced technology credits.*

(i) For the Phase 1 program, manufacturers of heavy-duty pickup trucks and vans, vocational vehicles, tractors and the associated engines showing improvements in CO<sub>2</sub> emissions and fuel consumption using hybrid vehicles with regenerative braking, vehicles equipped with Rankine-cycle engines, electric vehicles and fuel cell vehicles are eligible for advanced technology credits. Manufacturers shall use sound engineering judgment to determine the performance of the vehicle or engine with advanced technology. Advanced technology credits for vehicles or engines complying with Phase 1 standards may be increased by a 1.5 multiplier. Manufacturers may not apply this multiplier in addition to any early-credit multipliers. The maximum amount of credits a manufacturer may bring into the service class group that contains the heavy-duty pickup and van averaging set is 5.89·10<sup>6</sup> gallons (for advanced technology credits based upon compression-ignition engines) or 6.76·10<sup>6</sup> gallons (for advanced technology credits based upon spark-ignition engines) per model year as specified in 40 CFR part 86 for heavy-

duty pickup trucks and vans, 40 CFR 1036.740 for engines and 40 CFR 1037.740 for tractors and vocational vehicles. The specified limit does not cap the amount of advanced technology credits that can be used across averaging sets within the same service class group. Advanced technology credits can be used to offset negative credits in the same averaging set or other averaging sets. A manufacturer must first apply advanced technology credits to any deficits in the same averaging set before applying them to other averaging.

(A) *Heavy-duty pickup trucks and vans.* For advanced technology systems (hybrid vehicles with regenerative braking, vehicles equipped with Rankine-cycle engines and fuel cell vehicles), calculate fleet-average performance rates consistent with good engineering judgment and the provisions of 40 CFR 86.1819–14 and 86.1865.

(B) *Tractors and vocational vehicles.* For advanced technology system (hybrid vehicles with regenerative braking, vehicles equipped with Rankine-cycle engines and fuel cell vehicles), calculate the advanced technology credits as follows:

(1) Measure the effectiveness of the advanced system by conducting A to B testing a vehicle equipped with the advanced system and an equivalent conventional system in accordance with 40 CFR 1037.615.

(2) For purposes of this paragraph (e), a conventional vehicle is considered to be equivalent if it has the same footprint, intended vehicle service class, aerodynamic drag, and other relevant factors not directly related to the advanced system powertrain. If there is no equivalent vehicle, the manufacturer may create and test a prototype equivalent vehicle. The conventional vehicle is considered Vehicle A, and the advanced technology vehicle is considered Vehicle B.

(3) The benefit associated with the advanced system for fuel consumption is determined from the weighted fuel consumption results from the chassis tests of each vehicle using the following equation:

$$\text{Benefit (gallon/1000 ton mile)} = \text{Improvement Factor} \times \text{GEM Fuel Consumption Result}_B$$

Where:

$$\text{Improvement Factor} = \frac{(\text{Fuel Consumption}_A - \text{Fuel Consumption}_B)}{(\text{Fuel Consumption}_A)}$$

Fuel Consumption Rates A and B are the gallons per 1000 ton-mile of the conventional and advanced vehicles, respectively as measured under the test procedures specified by EPA. GEM Fuel Consumption Result B is the estimated gallons per 1000 ton-mile rate

resulting from emission modeling of the advanced vehicle as specified in 40 CFR 1037.520 and § 535.6(b).

(4) Calculate the benefit in credits using the equation in paragraph (c) of this section and replacing the term (Std-FEL) with the benefit.

(5) For electric vehicles calculate the fuel consumption credits using an FEL of 0 g/1000ton-mile.

(C) *Heavy-duty engines.* This section specifies how to generate advanced technology-specific fuel consumption credits for hybrid powertrains that include energy storage systems and regenerative braking (including regenerative engine braking) and for engines that include Rankine-cycle (or other bottoming cycle) exhaust energy recovery systems.

(1) Pre-transmission hybrid powertrains are those engine systems that include features that recover and store energy during engine motoring operation but not from the vehicle wheels. These powertrains are tested using the hybrid engine test procedures of 40 CFR part 1065 or using the post-transmission test procedures.

(2) Post-transmission hybrid powertrains are those powertrains that include features that recover and store energy from braking at the vehicle wheels. These powertrains are tested by simulating the chassis test procedure applicable for hybrid vehicles under 40 CFR 1037.550.

(3) Test engines that include Rankine-cycle exhaust energy recovery systems according to the test procedures specified in 40 CFR part 1036, subpart F, unless EPA approves the manufacturer's alternate procedures.

(D) *Credit calculation.* Calculate credits as specified in paragraph (c) of this section. Credits generated from engines and powertrains certified under this section may be used in other averaging sets as described in 40 CFR 1036.740(d).

(ii) There are no separate credit allowances for advanced technology vehicles in the Phase 2 program. Instead, vehicle families containing plug-in battery electric hybrids, all-electric, and fuel cell vehicles certifying to Phase 2 vocational and tractor standards may multiply credits by a multiplier of:

- (A) 3.5 times for plug-in hybrid electric vehicles;
- (B) 4.5 times for all-electric vehicles; and
- (C) 5.5 times for fuel cell vehicles.

(D) Incentivized credits for vehicles equipped with advanced technologies maintain the same credit flexibilities and restrictions as conventional credits

specified in paragraph (a) of this section during the Phase 2 program.

(E) For vocational vehicles and tractors subject to Phase 2 standards, create separate vehicle families if there is a credit multiplier for advanced technology; group those vehicles together in a vehicle family if they use the same multiplier.

(F) For Phase 2 plug-in hybrid electric vehicles and for fuel cells powered by any fuel other than hydrogen, calculate fuel consumption credits using an FEL based on equivalent emission measurements from powertrain testing. Phase 2 advanced-technology credits do not apply for hybrid vehicles that have no plug-in capability.

(2) *Innovative and off-cycle technology credits.* This provision allows fuel saving innovative and off-cycle engine and vehicle technologies to generate fuel consumption credits comparable to CO<sub>2</sub> emission credits consistent with the provisions of 40 CFR 86.1819–14(d)(13) (for heavy-duty pickup trucks and vans), 40 CFR 1036.610 (for engines), and 40 CFR 1037.610 (for vocational vehicles and tractors).

(i) For model years 2013 through 2020, manufacturers may generate innovative technology credits for introducing technologies that were not in-common use for heavy-duty tractor, vocational vehicles or engines before model year 2010 and that are not reflected in the EPA specified test procedures. Upon identification and joint approval with EPA, NHTSA will allow equivalent fuel consumption credits into its program to those allowed by EPA for manufacturers seeking to obtain innovative technology credits in a given model year. Such credits must remain within the same regulatory subcategory in which the credits were generated. NHTSA will adopt fuel consumption credits depending upon whether—

(A) The technology has a direct impact upon reducing fuel consumption performance; and

(B) The manufacturer has provided sufficient information to make sound engineering judgments on the impact of the technology in reducing fuel consumption performance.

(ii) For model years 2021 and later, manufacturers may generate off-cycle technology credits for introducing technologies that are not reflected in the EPA specified test procedures. Upon identification and joint approval with EPA, NHTSA will allow equivalent fuel consumption credits into its program to those allowed by EPA for manufacturers seeking to obtain innovative technology credits in a given model year. Such

credits must remain within the same regulatory subcategory in which the credits were generated. NHTSA will adopt fuel consumption credits depending upon whether—

(A) The technology meets paragraph (f)(2)(i)(A) and (B) of this section.

(B) For heavy-duty pickup trucks and vans, manufacturers using the 5-cycle test to quantify the benefit of a technology are not required to obtain approval from the agencies to generate results.

(iii) The following provisions apply to all innovative and off-cycle technologies:

(A) Technologies found to be defective, or identified as a part of NHTSA's safety defects program, and technologies that are not performing as intended will have the values of approved off-cycle credits removed from the manufacturer's credit balance.

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

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

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

(C) Manufacturers requesting approval for innovative technology credits are required to provide documentation in accordance with 40 CFR 86.1869–12, 1036.610, and 1037.610.

(D) Credits will be accepted on a one-for-one basis expressed in terms of gallons in comparison to those approved by EPA.

(E) For the heavy-duty pickup trucks and vans, the average fuel consumption will be calculated as a separate credit amount (rounded to the nearest whole number) using the following equation: Off-cycle FC credits = (CO<sub>2</sub> Credit/CF) × 100 × Production × VLM

Where:

CO<sub>2</sub> Credits = the credit value in grams per mile determined in 40 CFR 86.1869–12(c)(3), (d)(1), (d)(2) or (d)(3).

CF = conversion factor, which for spark-ignition engines is 8,887 and for compression-ignition engines is 10,180.

Production = the total production volume for the applicable category of vehicles.

VLM = vehicle lifetime miles, which for 2b–3 vehicles shall be 150,000 for the Phase 2 program.

The term (CO<sub>2</sub> Credit/CF) should be rounded to the nearest 0.0001

(F) NHTSA will not approve innovative technology credits for technology that is related to crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes.

(iv) Manufacturers normally may not calculate off-cycle credits or improvement factors under this section for technologies represented by GEM, but the agencies may allow a manufacturer to do so by averaging multiple GEM runs for special technologies for which a single GEM run cannot accurately reflect in-use performance. For example, if a manufacturer use an idle-reduction technology that is effective 80 percent of the time, the agencies may allow a manufacturer to run GEM with the technology active and with it inactive, and then apply an 80% weighting factor to calculate the off-cycle credit or improvement factor. A may need to perform testing to establish proper weighting factors or otherwise quantify the benefits of the special technologies.

(vi) *Carry-over Approval.*

Manufacturers may carry-over these credits into future model years as described below:

(A) For model years before 2021, manufacturers may continue to use an approved improvement factor or credit for any appropriate engine or vehicle family in future model years through 2020.

(B) For model years 2021 and later, manufacturers may not rely on an approval for model years before 2021. Manufacturers must separately request the agencies approval before applying an improvement factor or credit under this section for 2021 and later engines and vehicle, even if the agencies approve the improvement factor or credit for similar engine and vehicle models before model year 2021.

(C) The following restrictions also apply to manufacturers seeking to continue to carryover the improvement factor (not the credit value) if—

(1) The FEL is generated by GEM or 5-cycle testing;

(2) The technology is not changed or paired with any other off-cycle technology;

(3) The improvement factor only applies to approved vehicle or engine families;

(4) The agencies do not expect the technology to be incorporated into GEM at any point during the Phase 2 program; and

(D) The documentation to carryover credits that would primarily justify the difference in fuel efficiency between real world and compliance protocols is the same for both Phase 1 and Phase 2 compliance protocols. The agencies must approve the justification. If the agencies do not approve the justification, the manufacturer must recertify.

#### § 535.8 Reporting and recordkeeping requirements.

##### (a) General requirements.

Manufacturers producing heavy-duty vehicles and engines applicable to fuel consumption standards in § 535.5, for each given model year, must submit the required information as specified in paragraphs (b) through (h) of this section.

(1) The information required by this part must be submitted by the deadlines specified in this section and must be based upon all the information and data available to the manufacturer 30 days before submitting information.

(2) Manufacturers must submit information electronically through the EPA database system as the single point of entry for all information required for this national program and both agencies will have access to the information. In special circumstances, data may not be able to be received electronically (*i.e.*, during database system development work). The agencies will inform manufacturer of the alternatives can be used for submitting information. The format for the required information will be specified by EPA in coordination with NHTSA.

(3) Manufacturers providing incomplete reports missing any of the required information or providing untimely reports are considered as not complying with standards (*i.e.*, if good-faith estimates of U.S.-directed production volumes for EPA certificates of conformity are not provided) and are liable to pay civil penalties in accordance with 49 U.S.C. 32912.

(4) Manufacturers certifying a vehicle or engine family using an FEL or FCL below the applicable fuel consumption standard as described in § 535.5 may choose not to generate fuel consumption credits for that family. In which case, the manufacturer is not required to submit reporting or keep the associated records described in this part for that family.

(5) Manufacturers must use good engineering judgment and provide comparable fuel consumption

information to that of the information or data provided to EPA under 40 CFR 86.1865, 1036.250, 1036.730, 1036.825 1037.250, 1037.730, and 1037.825.

(6) Any information that must be sent directly to NHTSA. In instances in which EPA has not created an electronic pathway to receive the information, the information should be sent through an electronic portal identified by NHTSA or through the NHTSA CAFE database (*i.e.*, information on fuel consumption credit transactions). If hardcopy documents must be sent, the information should be sent to the Associate Administrator of Enforcement at 1200 New Jersey Avenue SE, NVS-200, Office W45-306EOY, Washington, DC 20590.

##### (b) Pre-model year reports.

Manufacturers producing heavy-duty pickup trucks and vans must submit reports in advance of the model year providing early estimates demonstrating how their fleet(s) would comply with GHG emissions and fuel consumption standards. Note, the agencies understand that early model year reports contain estimates that may change over the course of a model year and that compliance information manufacturers submit prior to the beginning of a new model year may not represent the final compliance outcome. The agencies view the necessity for requiring early model reports as a manufacturer's good faith projection for demonstrating compliance with emission and fuel consumption standards.

(1) *Report deadlines.* For model years 2013 and later, manufacturer of heavy-duty pickup trucks and vans complying with voluntary and mandatory standards must submit a pre-model year report for the given model year as early as the date of the manufacturer's annual certification preview meeting with EPA and NHTSA, or prior to submitting its first application for a certificate of conformity to EPA in accordance with 40 CFR 86.1819-14(d). For example, a manufacturer choosing to comply in model year 2014 could submit its pre-model year report during its precertification meeting which could occur before January 2, 2013, or could provide its pre-model year report any time prior to submitting its first application for certification for the given model year.

(2) *Contents.* Each pre-model year report must be submitted including the following information for each model year.

(i) A list of each unique subconfiguration in the manufacturer's fleet describing the make and model designations, attribute based-values (*i.e.*,

GVWR, GCWR, Curb Weight and drive configurations) and standards;

(ii) The emission and fuel consumption fleet average standard derived from the unique vehicle configurations;

(iii) The estimated vehicle configuration, test group and fleet production volumes;

(iv) The expected emissions and fuel consumption test group results and fleet average performance;

(v) If complying with MY 2013 fuel consumption standards, a statement must be provided declaring that the manufacturer is voluntarily choosing to comply early with the EPA and NHTSA programs. The manufacturers must also acknowledge that once selected, the decision cannot be reversed and the manufacturer will continue to comply with the fuel consumption standards for subsequent model years for all the vehicles it manufacturers in each regulatory category for a given model year;

(vi) If complying with MYs 2014, 2015 or 2016 fuel consumption standards, a statement must be provided declaring whether the manufacturer will use fixed or increasing standards in accordance with § 535.5(a). The manufacturer must also acknowledge that once selected, the decision cannot be reversed and the manufacturer must continue to comply with the same alternative for subsequent model years for all the vehicles it manufacturers in each regulatory category for a given model year;

(vii) If complying with MYs 2014 or 2015 fuel consumption standards, a statement must be provided declaring that the manufacturer is voluntarily choosing to comply with NHTSA's voluntary fuel consumption standards in accordance with § 535.5(a)(4). The manufacturers must also acknowledge that once selected, the decision cannot be reversed and the manufacturer will continue to comply with the fuel consumption standards for subsequent model years for all the vehicles it manufacturers in each regulatory category for a given model year;

(viii) The list of Class 2b and 3 incomplete vehicles (cab-complete or chassis complete vehicles) and the method used to certify these vehicles as complete pickups and vans identifying the most similar complete sister- or other complete vehicles used to derive the target standards and performance test results;

(ix) The list of Class 4 and 5 incomplete and complete vehicles and the method use to certify these vehicles as complete pickups and vans identifying the most similar complete or

sister vehicles used to derive the target standards and performance test results;

(x) List of loose engines included in the heavy-duty pickup and van category and the list of vehicles used to derive target standards and performance test results;

(xi) Copy of any notices a vehicle manufacturer sends to the engine manufacturer to notify the engine manufacturers that their engines are subject to emissions and fuel consumption standards and that it intends to use their engines in excluded vehicles;

(xii) A fuel consumption credit plan as specified § 535.7(a) identifying the manufacturers estimated credit balances, planned credit flexibilities (*i.e.*, credit balances, planned credit trading, innovative, advanced and early credits and etc.) and if needed a credit deficit plan demonstrating how it plans to resolve any credit deficits that might occur for a model year within a period of up to three model years after that deficit has occurred; and

(xiii) The supplemental information specified in paragraph (h) of this section. [Note: NHTSA may also ask a manufacturer to provide additional information, if necessary, to verify compliance with the fuel consumption requirements of this regulation.]

(c) *Applications for certificate of conformity.* Manufacturers producing vocational vehicles, tractors and heavy-duty engines are required to submit applications for certificates of conformity to EPA in accordance with 40 CFR 1036.205 and 1037.205 in advance of introducing vehicles for commercial sale. Applications contain early model year information demonstrating how manufacturers plan to comply with GHG emissions. For model years 2013 and later, manufacturers of vocational vehicles, tractors and engine complying with NHTSA's voluntary and mandatory standards must submit applications for certificates of conformity in accordance through the EPA database including both GHG emissions and fuel consumption information for each given model year.

(1) *Submission deadlines.*

Applications are primarily submitted in advance of the given model year to EPA but cannot be submitted any later than December 31 of the given model year.

(2) *Contents.* Each application for certificates of conformity submitted to EPA must include the following equivalent fuel consumption.

(i) Equivalent fuel consumption values for emissions CO<sub>2</sub> FCLs values used to certify each engine family in accordance with 40 CFR 1036.205(e).

This provision applies only to manufacturers producing heavy-duty engines.

(ii) Equivalent fuel consumption values for emission CO<sub>2</sub> data engines used to comply with emission standards in 40 CFR 1036.108. This provision applies only to manufacturers producing heavy-duty engines.

(iii) Equivalent fuel consumption values for emissions CO<sub>2</sub> FELs values used to certify each vehicle families or subfamilies in accordance with 40 CFR 1037.205(k). This provision applies only to manufacturers producing vocational vehicles and tractors.

(iv) Report modeling results for ten configurations in terms of CO<sub>2</sub> emissions and equivalent fuel consumption results in accordance with 40 CFR 1037.205(o). Include modeling inputs and detailed descriptions of how they were derived. This provision applies only to manufacturers producing vocational vehicles and tractors.

(v) Credit plans including the fuel consumption credit plan described in § 535.7(a).

(3) *Additional supplemental information.* Manufacturers are required to submit additional information as specified in paragraph (h) of this section for the NHTSA program before or at the same time it submits its first application for a certificate of conformity to EPA. Under limited conditions, NHTSA may also ask a manufacturer to provide additional information directly to the Administrator, if necessary, to verify the fuel consumption requirements of this regulation.

(d) *End of the Year (EOY) and Final reports.* Heavy-duty vehicle and engine manufacturers participating in the ABT program are required to submit EOY and final reports containing information for NHTSA as specified in paragraph (d)(2) of this section and in accordance with 40 CFR 86.1865, 1036.730, and 1037.730. Only manufacturers without credit deficits may decide not to participate in the ABT or may waive the requirement to send an EOY report. The EOY and final reports are used to review a manufacturer's preliminary or final compliance information and to identify manufacturers that might have a credit deficit for the given model year. For model years 2013 and later, heavy-duty vehicle and engine manufacturers complying with NHTSA's voluntary and mandatory standards must submit EOY and final reports through the EPA database including both GHG emissions and fuel consumption information for each given model year.

(1) *Report deadlines.* (i) For model year 2013 and later, heavy-duty vehicle

and engine manufacturers complying with NHTSA voluntary and mandatory standards must submit EOY reports through the EPA database including both GHG emissions and fuel consumption information within 90 days after the end of the given model year and no later than March 31 of the next calendar year.

(ii) For model year 2013 and later, heavy-duty vehicle and engine manufacturers complying with NHTSA voluntary and mandatory standards must submit final reports through the EPA database including both GHG emissions and fuel consumption information within 270 days after the end of the given model year and no later than September 30 of the next calendar year.

(iii) A manufacturer may ask NHTSA and EPA to extend the deadline of a final report by up to 30 days. A manufacturer unable to provide and requesting to omit an emissions rate or fuel consumption value from a final report must obtain approval from the agencies prior to the submission deadline of its final report.

(iv) If a manufacturer expects differences in the information reported between the EOY and the final year report specified in 40 CFR 1036.730 and 1037.730, it must provide the most up-to-date fuel consumption projections in its final report and identify the information as preliminary.

(v) If the manufacturer cannot provide any of the required fuel consumption information, it must state the specific reason for the insufficiency and identify the additional testing needed or explain what analytical methods are believed by the manufacturer will be necessary to eliminate the insufficiency and certify that the results will be available for the final report.

(2) *Contents.* Each EOY and final report must be submitted including the following fuel consumption information for each model year. EOY reports contain preliminary final estimates and final reports must include the manufacturer's final compliance information.

(i) Engine and vehicle family designations and averaging sets.

(ii) Engine and vehicle regulatory subcategory and fuel consumption standards including any alternative standards used.

(iii) Engine and vehicle family FCLs and FELs in terms of fuel consumption.

(iv) Production volumes for engines and vehicles.

(v) A summary as specified in paragraph (g)(7) of this section describing the vocational vehicles and vocational tractors that were exempted

as heavy-duty off-road vehicles. This applies to manufacturers participating and not participating in the ABT program.

(vi) A summary describing any advanced or innovative technology engines or vehicles including alternative fueled vehicles that were produced for the model year identifying the approaches used to determine compliance and the production volumes.

(vii) A list of each unique subconfiguration included in a manufacturer's fleet of heavy-duty pickup trucks and vans identifying the attribute based-values (GVWR, GCWR, Curb Weight, and drive configurations) and standards. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(viii) The fuel consumption fleet average standard derived from the unique vehicle configurations. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(ix) The subconfiguration and test group production volumes. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(x) The fuel consumption test group results and fleet average performance. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(xi) Manufacturers may correct errors in EOY and final reports as follows:

(A) Manufacturers may correct any errors in their end-of-year report when preparing the final report, as long as manufacturers send us the final report by the time it is due.

(B) If manufacturers or the agencies determine within 270 days after the end of the model year that errors mistakenly decreased the manufacturer's balance of fuel consumption credits, manufacturers may correct the errors and recalculate the balance of its fuel consumption credits. Manufacturers may not make any corrections for errors that are determined more than 270 days after the end of the model year. If manufacturers report a negative balance of fuel consumption credits, NHTSA may disallow corrections under this paragraph (d)(2)(xi)(B).

(C) If manufacturers or the agencies determine any time that errors mistakenly increased its balance of fuel consumption credits, manufacturers must correct the errors and recalculate the balance of fuel consumption credits.

(xii) Under limited conditions, NHTSA may also ask a manufacturer to provide additional information directly to the Administrator, if necessary, to

verify the fuel consumption requirements of this regulation.

(e) *Amendments to applications for certification.* At any time, a manufacturer modifies an application for certification in accordance with 40 CFR 1036.225 and 1037.225, it must submit GHG emissions changes with equivalent fuel consumption values for the information required in paragraphs (b) through (e) and (h) of this section.

(f) *Confidential information.* Manufacturers must submit a request for confidentiality with each electronic submission specifying any part of the for information or data in a report that it believes should be withheld from public disclosure as trade secret or other confidential business information.

Information submitted to EPA should follow EPA guidelines for treatment of confidentiality. Requests for confidential treatment for information submitted to NHTSA must be filed in accordance with the requirements of 49 CFR part 512, including submission of a request for confidential treatment and the information for which confidential treatment is requested as specified by part 512. For any information or data requested by the manufacturer to be withheld under 5 U.S.C. 552(b)(4) and 49 U.S.C. 32910(c), the manufacturer shall present arguments and provide evidence in its request for confidentiality demonstrating that—

(1) The item is within the scope of 5 U.S.C. 552(b)(4) and 49 U.S.C. 32910(c);

(2) The disclosure of the information at issue would cause significant competitive damage;

(3) The period during which the item must be withheld to avoid that damage; and

(4) How earlier disclosure would result in that damage.

(g) *Additional required information.* The following additional information is required to be submitted through the EPA database. NHTSA reserves the right to ask a manufacturer to provide additional information, if necessary, to verify the fuel consumption requirements of this regulation.

(1) *Small businesses.* For model years 2013 through 2020, vehicles and engines produced by small business manufacturers meeting the criteria in 13 CFR 121.201 are exempted from the requirements of this part. Qualifying small business manufacturers must notify EPA and NHTSA Administrators before importing or introducing into U.S. commerce exempted vehicles or engines. This notification must include a description of the manufacturer's qualification as a small business under 13 CFR 121.201. Manufacturers must submit this notification to EPA, and

EPA will provide the notification to NHTSA. The agencies may review a manufacturer's qualification as a small business manufacturer under 13 CFR 121.201.

(2) *Emergency vehicles.* For model years 2021 and later, emergency vehicles produced by heavy-duty pickup truck and van manufacturers are exempted except those produced by manufacturers voluntarily complying with standards in § 535.5(a). Manufacturers must notify the agencies in writing if using the provisions in § 535.5(a) to produce exempted emergency vehicles in a given model year, either in the report specified in 40 CFR 86.1865 or in a separate submission.

(3) *Early introduction.* The provision applies to manufacturers seeking to comply early with the NHTSA's fuel consumption program prior to model year 2014. The manufacturer must send the request to EPA before submitting its first application for a certificate of conformity.

(4) *NHTSA voluntary compliance model years.* Manufacturers must submit a statement declaring whether the manufacturer chooses to comply voluntarily with NHTSA's fuel consumption standards for model years 2014 through 2015. The manufacturers must acknowledge that once selected, the decision cannot be reversed and the manufacturer will continue to comply with the fuel consumption standards for subsequent model years. The manufacturer must send the statement to EPA before submitting its first application for a certificate of conformity.

(5) *Alternative engine standards.* Manufacturers choosing to comply with the alternative engine standards must notify EPA and NHTSA of their choice and include in that notification a demonstration that it has exhausted all available credits and credit opportunities. The manufacturer must send the statement to EPA before submitting its EOY report.

(6) *Alternate phase-in.* Manufacturers choosing to comply with the alternative engine phase-in must notify EPA and NHTSA of their choice. The manufacturer must send the statement to EPA before submitting its first application for a certificate of conformity.

(7) *Off-road exclusion (tractors and vocational vehicles only).* (i) Tractors and vocational vehicles primarily designed to perform work in off-road environments such as forests, oil fields, and construction sites may be exempted without request from the requirements of this regulation as specified in 49 CFR

523.2 and § 535.5(b). Within 90 days after the end of each model year, manufacturers must send EPA and NHTSA through the EPA database a report with the following information:

(A) A description of each excluded vehicle configuration, including an explanation of why it qualifies for this exclusion.

(B) The number of vehicles excluded for each vehicle configuration.

(ii) A manufacturer having an off-road vehicle failing to meet the criteria under the agencies' off-road exclusions will be allowed to request an exclusion of such a vehicle from EPA and NHTSA. The approval will be granted through the certification process for the vehicle family and will be done in collaboration between EPA and NHTSA in accordance with the provisions in 40 CFR 1037.150, 1037.210, and 1037.631.

(8) *Vocational tractors*. Tractors intended to be used as vocational tractors may comply with vocational vehicle standards in § 535.5(b) of this regulation. Manufacturers classifying tractors as vocational tractors must provide a description of how they meet the qualifications in their applications for certificates of conformity as specified in 40 CFR 1037.205.

(9) *Approval of alternate methods to determine drag coefficients (tractors only)*. Manufacturers seeking to use alternative methods to determine aerodynamic drag coefficients must provide a request and gain approval by EPA in accordance with 40 CFR 1037.525. The manufacturer must send the request to EPA before submitting its first application for a certificate of conformity.

(10) *Innovative and off-cycle technology credits*. Manufacturers pursuing innovative and off-cycle technology credits must submit information to the agencies and may be subject to a public evaluation process in which the public would have opportunity for comment if the manufacturer is not using a test procedure in accordance with 40 CFR 1037.610(c). Whether the approach involves on-road testing, modeling, or some other analytical approach, the manufacturer would be required to present a final methodology to EPA and NHTSA. EPA and NHTSA would approve the methodology and credits only if certain criteria were met. Baseline emissions and fuel consumption and control emissions and fuel consumption would need to be clearly demonstrated over a wide range of real-world driving conditions and over a sufficient number of vehicles to address issues of uncertainty with the data. Data would need to be on a vehicle

model-specific basis unless a manufacturer demonstrated model-specific data was not necessary. The agencies may publish a notice of availability in the **Federal Register** notifying the public of a manufacturer's proposed alternative off-cycle credit calculation methodology and provide opportunity for comment. Any notice will include details regarding the methodology, but not include any Confidential Business Information.

(11) *Credit trades*. If a manufacturer trades fuel consumption credits, it must send EPA and NHTSA a fuel consumption credit plan as specified in § 535.7(a) and provide the following additional information:

(i) As the seller, the manufacturer must include the following information:

(A) The corporate names of the buyer and any brokers.

(B) A copy of any contracts related to the trade.

(C) The averaging set corresponding to the engine and powertrain families and sub-families that generated fuel consumption credits for the trade, including the number of fuel consumption credits from each averaging set.

(ii) As the buyer, the manufacturer or entity must include the following information in its report:

(A) The corporate names of the seller and any brokers.

(B) A copy of any contracts related to the trade.

(C) How the manufacturer or entity intends to use the fuel consumption credits, including the number of fuel consumption credits it intends to apply for each averaging set.

(D) A copy of the contract with signatures from both the buyer and the seller.

(12) *Production reports*. Within 90 days after the end of the model year and no later than March 31st, manufacturers participating and not-participating in the ABT program must send to EPA and NHTSA a report including the total U.S.-directed production volume of vehicles it produced in each vehicle and engine family during the model year (based on information available at the time of the report) as required by 40 CFR 1036.250 and 1037.250. Each manufacturer shall report by vehicle or engine identification number and by configuration and identify the subfamily identifier. Report uncertified vehicles sold to secondary vehicle manufacturers. Small business manufacturers may omit reporting. Identify any differences between volumes included for EPA but excluded for NHTSA.

(13) *Transition to engine-based model years*. The following provisions apply for production and ABT reports during the transition to engine-based model year determinations for tractors and vocational vehicles in 2020 and 2021:

(i) If a manufacturer installs model year 2020 or earlier engines in the manufacturer's vehicles in calendar year 2020, include all those Phase 1 vehicles in its production and ABT reports related to model year 2020 compliance, although the agencies may require the manufacturer to identify these separately from vehicles produced in calendar year 2019.

(ii) If a manufacturer installs model year 2020 engines in its vehicles in calendar year 2021, submit production and ABT reports for those Phase 1 vehicles separate from the reports it submits for Phase 2 vehicles with model year 2021 engines.

(h) *Public information*. Based upon information submitted by manufacturers and EPA, NHTSA will publish fuel consumption standards and performance results.

(i) *Information received from EPA*. NHTSA will receive information from EPA as specified in 40 CFR 1036.755 and 1037.755. If NHTSA or EPA finds that information is provided fraudulent or grossly negligent or otherwise provided in bad faith, the manufacturer may be liable to civil penalties in accordance with each agency's authority.

(j) *Recordkeeping*. NHTSA has the same recordkeeping requirements as the EPA, specified in 40 CFR 86.1865–12(k), 1036.250, 1036.735, 1036.825, 1037.250, 1037.735, and 1037.825. The agencies each reserve the right to request information contained in reports separately.

(1) Manufacturers must organize and maintain records for NHTSA as described in this section. NHTSA in conjunction or separately from EPA may review a manufacturers records at any time.

(2) Keep the records required by this section for at least eight years after the due date for the end-of-year report. Manufacturers may not use fuel consumption credits for any engines if it does not keep all the records required under this section. Manufacturers must therefore keep these records to continue to bank valid credits. Store these records in any electronic format and on any media, as long as the manufacturer can promptly send the agencies organized records in English if the agencies ask for them. Manufacturers must keep these records readily available. NHTSA may review them at any time.



(3) Keep a copy of the reports required in § 535.8 and 40 CFR 1036.725, 1036.730, 1037.725 and 1037.730.

(4) Keep records of the vehicles and engine identification number (usually the serial number) for each vehicle and engine produced that generates or uses fuel consumption credits under the ABT program. Manufacturers may identify these numbers as a range. If manufacturers change the FEL after the start of production, identify the date started using each FEL/FCL and the range of vehicles or engine identification numbers associated with each FEL/FCL. Manufacturers must also identify the purchaser and destination for each vehicle and engine produced to the extent this information is available.

(5) The agencies may require manufacturers to keep additional records or to send relevant information not required by this section in accordance with each agency's authority.

(6) If collected separately and NHTSA finds that information is provided fraudulent or grossly negligent or otherwise provided in bad faith, the manufacturer may be liable to civil penalties in accordance with each agency's authority.

#### § 535.9 Enforcement approach.

(a) *Compliance.* (1) Each year NHTSA will assess compliance with fuel consumption standards as specified in § 535.10.

(i) NHTSA may conduct audits or confirmatory testing prior to first sale throughout a given model year or after the model year in order to validate data received from manufacturers and will discuss any potential issues with EPA and the manufacturer. NHTSA will perform confirmatory testing as specified in the EPA requirements defined in 40 CFR 1037.150, 1037.201 and 1037.235. Audits may periodically be performed to confirm manufacturers' credit balances, or other credit transactions or other information submitted to EPA and NHTSA.

(ii) NHTSA may also conduct field inspections either at manufacturing plants or at new vehicle dealerships to validate data received from manufacturers. Field inspections will be carried out in order to validate the condition of vehicles, engines or technology prior to first commercial sale to verify each component's certified configuration as initially built. NHTSA reserves the right to conduct inspections at other locations but will target only those components for which a violation would apply to OEMs and not the fleets or vehicle owners. Compliance

inspections could be carried out through a number of approaches including during safety inspections or during compliance safety testing.

(iii) NHTSA will conduct audits and inspections in the same manner and, when possible, in conjunction with EPA. NHTSA will also attempt to coordinate inspections with EPA and share results.

(iv) Documents collected under NHTSA safety authority may be used to support fuel efficiency audits and inspections.

(v) NHTSA may require a manufacturer to perform selective enforcement audits with respect to any GEM inputs in its application for certification or in the end of the year ABT final reports. Selective enforcement audits will be conducted similar to EPA's as defined in 40 CFR 1037.301, 40 CFR 1037.305 and 1037.320.

(2) At the end of each model year NHTSA will confirm a manufacturer's fleet or family performance values against the applicable standards and, if a manufacturer uses a credit flexibility, the amount of credits in each averaging set. The averaging set balance is based upon the engines or vehicles performance above or below the applicable regulatory subcategory standards in each respective averaging set and any credits that are traded into or out of an averaging set during the model year.

(i) If the balance is positive, the manufacturer is designated as having a credit surplus.

(ii) If the balance is negative, the manufacturer is designated as having a credit deficit.

(iii) NHTSA will provide notification to each manufacturer confirming its credit balance(s) after the end of each model year directly or through EPA.

(3) Manufacturer are required to confirm the negative balance and submit a fuel consumption credit plan as specified in § 535.7(a) along with supporting documentation indicating how it will allocate existing credits or earn (providing information on future vehicles, engines or technologies), and/or acquire credits, or else be liable for a civil penalty as determined in paragraph (b) of this section. The manufacturer must submit the information within 60 days of receiving agency notification.

(4) Credit shortfall within an averaging set may be carried forward only three years, and if not offset by earned or traded credits, the manufacturer may be liable for a civil penalty as described in paragraph (b) of this section.

(5) Credit allocation plans received from a manufacturer will be reviewed and approved by NHTSA. NHTSA will approve a credit allocation plan unless it determines that the proposed credits are unavailable or that it is unlikely that the plan will result in the manufacturer earning or acquiring sufficient credits to offset the subject credit shortfall. In the case where a manufacturer submits a plan to acquire future model year credits earned by another manufacturer, NHTSA will require a signed agreement by both manufacturers to initiate a review of the plan. If a plan is approved, NHTSA will revise the respective manufacturer's credit account accordingly by identifying which existing or traded credits are being used to address the credit shortfall, or by identifying the manufacturer's plan to earn future credits for addressing the respective credit shortfall. If a plan is rejected, NHTSA will notify the respective manufacturer and request a revised plan. The manufacturer must submit a revised plan within 14 days of receiving agency notification. The agency will provide a manufacturer one opportunity to submit a revised credit allocation plan before it initiates civil penalty proceedings.

(6) For purposes of this regulation, NHTSA will treat the use of future credits for compliance, as through a credit allocation plan, as a deferral of civil penalties for non-compliance with an applicable fuel consumption standard.

(7) If NHTSA receives and approves a manufacturer's credit allocation plan to earn future credits within the following three model years in order to comply with regulatory obligations, NHTSA will defer levying civil penalties for non-compliance until the date(s) when the manufacturer's approved plan indicates that credits will be earned or acquired to achieve compliance, and upon receiving confirmed CO<sub>2</sub> emissions and fuel consumption data from EPA. If the manufacturer fails to acquire or earn sufficient credits by the plan dates, NHTSA will initiate civil penalty proceedings.

(8) In the event that NHTSA fails to receive or is unable to approve a plan for a non-compliant manufacturer due to insufficiency or untimeliness, NHTSA may initiate civil penalty proceedings.

(9) In the event that a manufacturer fails to report accurate fuel consumption data for vehicles or engines covered under this rule, non-compliance will be assumed until corrected by submission of the required data, and NHTSA may initiate civil penalty proceedings.



(10) If EPA suspends or revoke a certificate of conformity as specified in 40 CFR 1036.255 or 1037.255, and a manufacturer is unable to take a corrective action allowed by EPA, noncompliance will be assumed, and NHTSA may initiate civil penalty proceedings or revoke fuel consumption credits.

(b) *Civil penalties.* (1) *Generally.* NHTSA may assess a civil penalty for any violation of this part under 49 U.S.C. 32902(k). This section states the procedures for assessing civil penalties for violations of § 535.3(h). The provisions of 5 U.S.C. 554, 556, and 557 do not apply to any proceedings conducted pursuant to this section.

(2) *Initial determination of noncompliance.* An action for civil penalties is commenced by the execution of a Notice of Violation. A determination by NHTSA's Office of Enforcement of noncompliance with applicable fuel consumption standards utilizing the certified and reported CO<sub>2</sub> emissions and fuel consumption data provided by the Environmental Protection Agency as described in this part, and after considering all the flexibilities available under § 535.7, underlies a Notice of Violation. If NHTSA Enforcement determines that a manufacturer's averaging set of vehicles or engines fails to comply with the applicable fuel consumption standard(s) by generating a credit shortfall, the incomplete vehicle, complete vehicle or engine manufacturer, as relevant, shall be subject to a civil penalty.

(3) *Numbers of violations and maximum civil penalties.* Any violation shall constitute a separate violation with respect to each vehicle or engine within the applicable regulatory averaging set. The maximum civil penalty is not more than \$37,500.00 per vehicle or engine. The maximum civil penalty under this section for a related series of violations shall be determined by multiplying \$37,500.00 times the vehicle or engine production volume for the model year in question within the regulatory averaging set. NHTSA may adjust this civil penalty amount to account for inflation.

(4) *Factors for determining penalty amount.* In determining the amount of any civil penalty proposed to be assessed or assessed under this section, NHTSA shall take into account the gravity of the violation, the size of the violator's business, the violator's history of compliance with applicable fuel consumption standards, the actual fuel consumption performance related to the applicable standards, the estimated cost to comply with the regulation and applicable standards, the quantity of

vehicles or engines not complying, and the effect of the penalty on the violator's ability to continue in business. The "estimated cost to comply with the regulation and applicable standards," will be used to ensure that penalties for non-compliance will not be less than the cost of compliance.

(5) *NHTSA enforcement report of determination of non-compliance.* (i) If NHTSA Enforcement determines that a violation has occurred, NHTSA Enforcement may prepare a report and send the report to the NHTSA Chief Counsel.

(ii) The NHTSA Chief Counsel will review the report prepared by NHTSA Enforcement to determine if there is sufficient information to establish a likely violation.

(iii) If the Chief Counsel determines that a violation has likely occurred, the Chief Counsel may issue a Notice of Violation to the party.

(iv) If the Chief Counsel issues a Notice of Violation, he or she will prepare a case file with recommended actions. A record of any prior violations by the same party shall be forwarded with the case file.

(6) *Notice of violation.* (i) The Notice of Violation will contain the following information:

(A) The name and address of the party;

(B) The alleged violation(s) and the applicable fuel consumption standard(s) violated;

(C) The amount of the proposed penalty and basis for that amount;

(D) The place to which, and the manner in which, payment is to be made;

(E) A statement that the party may decline the Notice of Violation and that if the Notice of Violation is declined within 30 days of the date shown on the Notice of Violation, the party has the right to a hearing, if requested within 30 days of the date shown on the Notice of Violation, prior to a final assessment of a penalty by a Hearing Officer; and

(F) A statement that failure to either pay the proposed penalty or to decline the Notice of Violation and request a hearing within 30 days of the date shown on the Notice of Violation will result in a finding of violation by default and that NHTSA will proceed with the civil penalty in the amount proposed on the Notice of Violation without processing the violation under the hearing procedures set forth in this subpart.

(ii) The Notice of Violation may be delivered to the party by—

(A) Mailing to the party (certified mail is not required);

(B) Use of an overnight or express courier service; or

(C) Facsimile transmission or electronic mail (with or without attachments) to the party or an employee of the party.

(iii) At any time after the Notice of Violation is issued, NHTSA and the party may agree to reach a compromise on the payment amount.

(iv) Once a penalty amount is paid in full, a finding of "resolved with payment" will be entered into the case file.

(v) If the party agrees to pay the proposed penalty, but has not made payment within 30 days of the date shown on the Notice of Violation, NHTSA will enter a finding of violation by default in the matter and NHTSA will proceed with the civil penalty in the amount proposed on the Notice of Violation without processing the violation under the hearing procedures set forth in this subpart.

(vi) If within 30 days of the date shown on the Notice of Violation a party fails to pay the proposed penalty on the Notice of Violation, and fails to request a hearing, then NHTSA will enter a finding of violation by default in the case file, and will assess the civil penalty in the amount set forth on the Notice of Violation without processing the violation under the hearing procedures set forth in this subpart.

(vii) NHTSA's order assessing the civil penalty following a party's default is a final agency action.

(7) *Hearing Officer.* (i) If a party timely requests a hearing after receiving a Notice of Violation, a Hearing Officer shall hear the case.

(ii) The Hearing Officer will be appointed by the NHTSA Administrator, and is solely responsible for the case referred to him or her. The Hearing Officer shall have no other responsibility, direct or supervisory, for the investigation of cases referred for the assessment of civil penalties. The Hearing Officer shall have no duties related to the light-duty fuel economy or medium- and heavy-duty fuel efficiency programs.

(iii) The Hearing Officer decides each case on the basis of the information before him or her.

(8) *Initiation of action before the Hearing Officer.* (i) After the Hearing Officer receives the case file from the Chief Counsel, the Hearing Officer notifies the party in writing of—

(A) The date, time, and location of the hearing and whether the hearing will be conducted telephonically or at the DOT Headquarters building in Washington, DC;

(B) The right to be represented at all stages of the proceeding by counsel as set forth in paragraph (b)(9) of this section; and

(C) The right to a free copy of all written evidence in the case file.

(ii) On the request of a party, or at the Hearing Officer's direction, multiple proceedings may be consolidated if at any time it appears that such consolidation is necessary or desirable.

(9) *Counsel.* A party has the right to be represented at all stages of the proceeding by counsel. A party electing to be represented by counsel must notify the Hearing Officer of this election in writing, after which point the Hearing Officer will direct all further communications to that counsel. A party represented by counsel bears all of its own attorneys' fees and costs.

(10) *Hearing location and costs.* (i) Unless the party requests a hearing at which the party appears before the Hearing Officer in Washington, DC, the hearing may be held telephonically. In Washington, DC, the hearing is held at the headquarters of the U.S. Department of Transportation.

(ii) The Hearing Officer may transfer a case to another Hearing Officer at a party's request or at the Hearing Officer's direction.

(iii) A party is responsible for all fees and costs (including attorneys' fees and costs, and costs that may be associated with travel or accommodations) associated with attending a hearing.

(11) *Hearing procedures.* (i) There is no right to discovery in any proceedings conducted pursuant to this subpart.

(ii) The material in the case file pertinent to the issues to be determined by the Hearing Officer is presented by the Chief Counsel or his or her designee.

(iii) The Chief Counsel may supplement the case file with information prior to the hearing. A copy of such information will be provided to the party no later than three business days before the hearing.

(iv) At the close of the Chief Counsel's presentation of evidence, the party has the right to examine, respond to and rebut material in the case file and other information presented by the Chief Counsel. In the case of witness testimony, both parties have the right of cross-examination.

(v) In receiving evidence, the Hearing Officer is not bound by strict rules of evidence. In evaluating the evidence presented, the Hearing Officer must give due consideration to the reliability and relevance of each item of evidence.

(vi) At the close of the party's presentation of evidence, the Hearing Officer may allow the introduction of

rebuttal evidence that may be presented by the Chief Counsel.

(vii) The Hearing Officer may allow the party to respond to any rebuttal evidence submitted.

(viii) After the evidence in the case has been presented, the Chief Counsel and the party may present arguments on the issues in the case. The party may also request an opportunity to submit a written statement for consideration by the Hearing Officer and for further review. If granted, the Hearing Officer shall allow a reasonable time for submission of the statement and shall specify the date by which it must be received. If the statement is not received within the time prescribed, or within the limits of any extension of time granted by the Hearing Officer, it need not be considered by the Hearing Officer.

(ix) A verbatim transcript of the hearing will not normally be prepared. A party may, solely at its own expense, cause a verbatim transcript to be made. If a verbatim transcript is made, the party shall submit two copies to the Hearing Officer not later than 15 days after the hearing. The Hearing Officer shall include such transcript in the record.

(12) *Determination of violations and assessment of civil penalties.* (i) Not later than 30 days following the close of the hearing, the Hearing Officer shall issue a written decision on the Notice of Violation, based on the hearing record. This may be extended by the Hearing officer if the submissions by the Chief Counsel or the party are voluminous. The decision shall address each alleged violation, and may do so collectively. For each alleged violation, the decision shall find a violation or no violation and provide a basis for the finding. The decision shall set forth the basis for the Hearing Officer's assessment of a civil penalty, or decision not to assess a civil penalty. In determining the amount of the civil penalty, the gravity of the violation, the size of the violator's business, the violator's history of compliance with applicable fuel consumption standards, the actual fuel consumption performance related to the applicable standard, the estimated cost to comply with the regulation and applicable standard, the quantity of vehicles or engines not complying, and the effect of the penalty on the violator's ability to continue in business. The assessment of a civil penalty by the Hearing Officer shall be set forth in an accompanying final order. The Hearing Officer's written final order is a final agency action.

(ii) If the Hearing Officer assesses civil penalties in excess of \$1,000,000, the

Hearing Officer's decision shall contain a statement advising the party of the right to an administrative appeal to the Administrator within a specified period of time. The party is advised that failure to submit an appeal within the prescribed time will bar its consideration and that failure to appeal on the basis of a particular issue will constitute a waiver of that issue in its appeal before the Administrator.

(iii) The filing of a timely and complete appeal to the Administrator of a Hearing Officer's order assessing a civil penalty shall suspend the operation of the Hearing Officer's penalty, which shall no longer be a final agency action.

(iv) There shall be no administrative appeals of civil penalties assessed by a Hearing Officer of less than \$1,000,000.

(13) *Appeals of civil penalties in excess of \$1,000,000.* (i) A party may appeal the Hearing Officer's order assessing civil penalties over \$1,000,000 to the Administrator within 21 days of the date of the issuance of the Hearing Officer's order.

(ii) The Administrator will review the decision of the Hearing Officer de novo, and may affirm the decision of the hearing officer and assess a civil penalty, or

(iii) The Administrator may—

(A) Modify a civil penalty;  
(B) Rescind the Notice of Violation; or  
(C) Remand the case back to the Hearing Officer for new or additional proceedings.

(iv) In the absence of a remand, the decision of the Administrator in an appeal is a final agency action.

(14) *Collection of assessed or compromised civil penalties.* (i) Payment of a civil penalty, whether assessed or compromised, shall be made by check, postal money order, or electronic transfer of funds, as provided in instructions by the agency. A payment of civil penalties shall not be considered a request for a hearing.

(ii) The party must remit payment of any assessed civil penalty to NHTSA within 30 days after receipt of the Hearing Officer's order assessing civil penalties, or, in the case of an appeal to the Administrator, within 30 days after receipt of the Administrator's decision on the appeal.

(iii) The party must remit payment of any compromised civil penalty to NHTSA on the date and under such terms and conditions as agreed to by the party and NHTSA. Failure to pay may result in NHTSA entering a finding of violation by default and assessing a civil penalty in the amount proposed in the Notice of Violation without processing

the violation under the hearing procedures set forth in this part.

(c) *Changes in corporate ownership and control.* Manufacturers must inform NHTSA of corporate relationship changes to ensure that credit accounts are identified correctly and credits are assigned and allocated properly.

(1) In general, if two manufacturers merge in any way, they must inform NHTSA how they plan to merge their credit accounts. NHTSA will subsequently assess corporate fuel consumption and compliance status of the merged fleet instead of the original separate fleets.

(2) If a manufacturer divides or divests itself of a portion of its automobile manufacturing business, it must inform NHTSA how it plans to divide the manufacturer's credit holdings into two or more accounts. NHTSA will subsequently distribute holdings as directed by the manufacturer, subject to provision for reasonably anticipated compliance obligations.

(3) If a manufacturer is a successor to another manufacturer's business, it must inform NHTSA how it plans to allocate credits and resolve liabilities per 49 CFR part 534.

**§ 535.10 How do manufacturers comply with fuel consumption standards?**

(a) *Pre-certification process.* (1) Regulated manufacturers determine eligibility to use exemptions or exclusions in accordance with § 535.3.

(2) Manufacturers may seek preliminary approvals as specified in 40 CFR 1036.210 and 40 CFR 1037.210 from EPA and NHTSA, if needed. Manufacturers may request to schedule pre-certification meetings with EPA and NHTSA prior to submitting approval requests for certificates of conformity to address any joint compliance issues and gain informal feedback from the agencies.

(3) The requirements and prohibitions required by EPA in special circumstances in accordance with 40 CFR 1037.601 and 40 CFR part 1068 apply, except for the warranty provisions in 40 CFR 1037.601(a)(5), to manufacturers for the purpose of complying with fuel consumption standards. Manufacturers should use good judgment when determining how EPA requirements apply in complying with the NHTSA program.

Manufacturers may contact NHTSA and EPA for clarification about how these requirements apply to them.

(4) In circumstances in which EPA provides multiple compliance approaches manufacturers must choose the same compliance path to comply with NHTSA's fuel consumption standards that they choose to comply with EPA's greenhouse gas emission standards.

(5) Manufacturers may not introduce new vehicles into commerce without a certificate of conformity from EPA. Manufacturers must attest to several compliance standards in order to obtain a certificate of conformity. This includes stating comparable fuel consumption results for all required CO<sub>2</sub> emissions rates. Manufacturers not completing these steps do not comply with the NHTSA fuel consumption standards.

(6) Manufacturers apply the fuel consumption standards specified in § 535.5 to vehicles, engines and components that represent production units and components for vehicle and engine families, sub-families and configurations consistent with the EPA specifications in 40 CFR 86.1819, 1036.230, and 1037.230. Vehicles required to meet the fuel consumption standards of this part must also comply with the same requirements as specified in 40 CFR 1037.115.

(7) Only certain vehicles and engines are allowed to comply differently between the NHTSA and EPA programs as detailed in this section. These vehicles and engines must be identified by manufacturers in the ABT and production reports required in § 535.8.

(b) *Model year compliance.* Manufacturers are required to conduct testing to demonstrate compliance with CO<sub>2</sub> exhaust emissions standards in accordance with EPA's provisions in 40 CFR part 600, subpart B, 40 CFR 1036, subpart F, 40 CFR part 1037, subpart R, and 40 CFR part 1066. Manufacturers determine equivalent fuel consumption performance values for CO<sub>2</sub> results as specified in § 535.6 and demonstrate compliance by comparing equivalent results to the applicable fuel consumption standards in § 535.5.

(c) *End-of-the-year process.* Manufacturers comply with fuel consumption standards after the end of each model year, if—

(1) For heavy-duty pickup trucks and vans, the manufacturer's fleet average

performance, as determined in § 535.6, is less than the fleet average standard; or

(2) For truck tractors, vocational vehicles and engines the manufacturer's fuel consumption performance for each vehicle or engine family (or sub-family), as determined in § 535.6, is lower than the applicable regulatory subcategory standards in § 535.5.

(4) NHTSA will use the EPA final verified values as specified in 40 CFR 86.1819, 40 CFR 1036.755, and 1037.755 for making final determinations on whether vehicles and engines comply with fuel consumption standards.

(5) A manufacturer fails to comply with fuel consumption standards if its final reports are not provided in accordance with § 535.8 and 40 CFR 86.1865, 1036.730, and 1037.730. Manufacturers not providing complete or accurate final reports or any plans by the required deadlines do not comply with fuel consumption standards. A manufacturer that is unable to provide any emissions results along with comparable fuel consumption values must obtain permission for EPA to exclude the results prior to the deadline for submitting final reports.

(6) A manufacturer that would otherwise fail to directly comply with fuel consumption standards as described in paragraphs (c)(1) through (3) of this section may use one or more of the credit flexibilities provided under the NHTSA averaging, banking and trading program, as specified in § 535.7, but must offset all credit deficits in its averaging sets to achieve compliance.

(7) A manufacturer failing to comply with the provisions specified in this part may be liable to pay civil penalties in accordance with § 535.9.

(8) A manufacturer may also be liable to pay civil penalties if found by EPA or NHTSA to have provided false information as identified through NHTSA or EPA enforcement audits or new vehicle verification testing as specified in § 535.9 and 40 CFR parts 86, 1036, and 1037.

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**Steven S. Cliff,**  
*Administrator.*

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