

Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles

Implementation Workshop 5th Edition

The Environmental Protection Agency (EPA) along with the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) organized and sponsored an implementation workshop in Ann Arbor, MI on November 3, 2011. The objective of this workshop was to provide guidance to heavy-duty (HD) engine and vehicle manufacturers who wish to exercise the option for early compliance under new greenhouse gas (GHG) and fuel consumption (FC) regulations (see 76 FR 57106) for model year 2013 products. By so doing, manufacturers are able to secure early credits which will enable a more efficient phase-in of compliant products and, by so doing, will provide cleaner and more fuel efficient technologies to the marketplace sooner.

The HD GHG and FC Implementation Workshop included a number of presentations describing the processes manufacturers would need to follow to certify vehicles and technologies, test certified products, exercise available compliance flexibilities and report information to the agencies. During the course of the workshop, questions were submitted to the EPA/NHTSA panel on note cards from the audience. Agency representatives answered a number of technical questions during the workshop.

This document contains a record of the answers EPA has completed to date to the questions submitted by industry before, during and after the November 3, 2011 workshop. This 5th Edition includes most of the remaining questions submitted by the industry, except those involving compliance and enforcement. Note that some questions have been re-ordered to group questions on similar topics together as much as possible. The agencies intend to update this document on a regular basis as the answers to additional questions are developed and as new questions that continue to come in over time are received and answered. Finally, wherever possible, when many questions are received that warrant the same answer, we have listed all these questions together under one question number in order to answer them once.

This document was prepared by EPA's Office of Transportation and Air Quality (OTAQ) with review and input from NHTSA. Regulated parties may use this document to aid in achieving compliance with the regulations for heavy-duty vehicles (40 CFR Part 86, 1037; and, 49 CFR Part 523, 534 and 535) and heavy-duty engines (40 CFR Part 1036; and, 49 CFR Part 523, 534 and 535). However, this document does not in any way alter the requirements in EPA's or NHTSA's regulations. Although the answers provided in this document interpret the regulations and indicate general plans for implementation of the regulations at this time, some of the responses may change as additional information becomes available, or as the agencies further consider certain issues. The questions and answers contained in this document do not establish or change the legal rights or obligations of manufacturers in complying with EPA and NHTSA regulations. Further, this document does not establish binding rules or requirements and is not fully determinative of the issues addressed. Moreover, Agency decisions in any particular case will be made applying the law and regulations on the basis of specific facts.

Updates since the 1st Edition:

- In the 2nd question in the Tire Rolling Resistance Q&A section, the agencies have added an additional sentence of clarification to this previously posted response. This new sentence reads as follows: "NHTSA has active on-going research to identify suitable references labs to the ISO test procedure. Pending completion of the NHTSA research, it is possible that the agencies will identify the appropriate reference lab. However, at this time ..."
- In the 4th and 5th questions in the "GENERAL" section, the agencies have revised the answers to include EPA's announcement that, as of March 6, 2011 per guidance letter CD-12-06, all HD GHG certification templates are now posted for industry use in submitting certification applications.

GENERAL:

General - Certification:

What is the anticipated timeline to get early certification?

Manufacturers should begin now collecting data and information required to submit a complete application for certification, carry out pre-certification meetings with the agencies and begin the application process. If manufacturers have prepared complete applications, EPA and NHTSA

will be ready to conduct application reviews and possibly issue certificates by the first quarter of calendar year 2012.

When will the Designated Compliance Officer (DCO) be named?

Per 1037.801, the DCO is defined as the manager of the Heavy-Duty and Nonroad Engine Group. Due to a recent reorganization of EPA's Office of Transportation and Air Quality, the name of the Heavy-Duty and Nonroad Engine Group has been changed to the Diesel Engine Compliance Center. The manager of the Diesel Engine Compliance Center is the DCO. The current DCO, Justin Greuel, can be reached at 202-343-9626. Each engine/truck manufacturer is assigned an EPA certification representative in the Diesel Engine Compliance Center who should be your first line of contact with EPA.

For 2b/3 Pick Ups and Vans, the certification representative is the same assigned for your LDV/LDT/MDPVs.

For HD Engines, the certification representative is the same assigned for your criteria pollution engine certification.

For Combination Tractors and Vocational Vehicles, your assigned certification representative is as follows:

Greg Orehowsky – Team leader and Certification Representative
Orehowsky.gregory@epa.gov – (202) 343-9292
Navistar/International, Fiat Powertrain, Mitsubishi Fuso
Manufacturers new to certification should contact Greg for assignment of a certification representative

Jason Gumbs – Certification representative
Gumbs.jason@epa.gov – (202) 343-9271
Detroit Diesel/Daimler Trucks, Volvo (P/T & trucks)

Jay Smith – Certification representative
Smith.jay@epa.gov – (734) 214-4302
PACCAR, Ford, GM, Cummins, Isuzu

Who will review and approve each portion of the certification data, both in the pre-certification meeting and in the application?

The review process for pre-certification and certification application review will be handled by various agency staff with your assigned certification representative as the focal point. Technical experts within EPA and NHTSA will be used for various aspects of the review process as needed (e.g., aerodynamics and tire consultation).

When will EPA be ready to provide certification templates?

These templates are now posted to epa.gov/otaq/certdat2.htm. As announced in EPA guidance letter CD-12-06 on March 6, 2012, certification application templates are now ready to be used by manufacturers submitting certification applications on or after this date.

When will EPA be ready to receive certification documents from OEMs?

Certification documents may be submitted at any time to your certification representative. As stated above, certification application templates are now available aid you in submitting application materials to EPA, per guidance letter CD-12-06.

Will there be fees? What will the GHG certification fees be for engines and vehicles and hybrids?

The Heavy Duty Greenhouse Gas Rule does not establish new fees. Thus, OEMs of HD engines and pickup trucks/vans will continue to pay a fee for criteria pollutant certification, but at this time there are no new fees associated with certification to heavy duty greenhouse gas standards. A consequence is that OEMs of vehicles not subject to criteria pollutant certification requirements (i.e., vocational chassis, combination tractors, and Class 4 & 5 certifying as HD Pickups/Vans) do not pay certification fees.

What system, if any, will be used for submission of early certification and future certification applications and supporting data?

The early credit certification will be done using FileMaker Pro for engines. Minor revisions to the engine FileMaker Pro templates will accommodate engine GHG certification data. New Excel-based templates for HD Pickups/Vans, Combination Tractors and Vocational Vehicles have been created. Certification information for all sectors will be submitted using the Central Data Exchange (CDX) system.

Will EPA provide templates for certification documentation and support data?

Yes. Certification application templates are provided. However, be sure to discuss this with your Certification Representative as some support documentation may need to be provided to EPA through the CDX in .pdf or similar format. Use the following URL, and then scroll down to the Heavy Duty Regulations section: www.epa.gov/otaq/climate/regulations.htm

What level of detail will EPA require for each aspect/topic that requires data?

The templates will define the information you need to provide to EPA and NHTSA to comply with regulations (see §1036.205 for engines, or §1037.205 for vehicles). To the extent that the templates are unclear to you, we encourage you to work with your Certification Representative.

Manufacturers must also keep the necessary back-up data and information should EPA require additional information to confirm the submission.

FEL vs. FCL

The morning presentation stated that the FCL is used for certification and for credits, while the FEL is used for audit purposes and in use testing.

- 1037.615 (e) calculate CO₂ credits using FEL for electric vehicles.
- 1037.705 (b) calculate CO₂ credits using FEL
- 1036.801: says FCL is used for CO₂ and FEL is used for other emissions, except CO₂ and for CO₂ FEL=FCL*1.03

Please clarify?

The Family Certification Level (FCL) only applies for CO₂ for Engines as described in 40CFR1036.108 and 1036.801. Vehicle manufacturers should use the Family Emission Limit (FEL) as described in 1037.801.

Product/Planning: What timing requirements does the agency anticipate HD GHG certification reviews will require for (1) Engines, (2) Vehicles? Since 1997, Engine certification has gone from 2-3 pages and a few days to , today, several hundreds of pages (both emissions and OBD) with multiple agency review (EPA/CARB) taking several months to get approvals. How many pages (or reams) does the EPA anticipate a vehicle certification application will be? And how long for EPA to review them?

The manufacturer will need to fill out certification templates and provide the requested supporting documentation. Length of the application package will be dependent upon complexity of emission control strategies (e.g., AECDs) or alternative test procedures used by the manufacturer. For a complete application (assuming that all preliminary approval items have already been resolved), a manufacturer can typically plan for at least 30-45 days after submitting the application. Incomplete applications can delay the processing time further.

Model Year End Date: When do OEMs need to tell EPA of the actual end date of a model year versus the projected end date that is put on the certification worksheet?

For purposes of meeting reporting obligations, end of model year is considered December 31st. If a manufacturer ends their production period earlier than December 31st, they should include the information in their end of year production reports.

Does EPA have a guidance document site similar to the Applicability Determination Index for Stationary Source Regulations (NSR, PSD, MAIT, NSPS), but for Part 85, 86, 1036, 1037 (mobile source ADI site). If not are there plans to establish one?

www.epa.gov/otaq/cert/dearmfr/dearmfr.htm
www.epa.gov/otaq/certdat2.htm

General - Vehicle/Engine Family Designation:

What will be the process for adding vehicle Families during the year?

Subfamilies may be added to a specific vehicle family using the running change provisions (§1037.225). However, for new vehicle families, the manufacturer must submit a new certification application.

In 1037.230 for Vehicle Families, etc., Vocational Tractors appear to be lumped into a single group for family naming purposes (xiii), unlike the division used for the Regulatory Sub-categories. Should all Class 7 and Class 8 Vocational Tractors be put into a single family? If so, should they be segregated into separate subfamilies with unique FELs for both stringency targets and reporting?

A strict interpretation of §1037.230(a)(1)(xiii) seems to allow you to group both class 7 and class 8 vocational tractors together, regardless of the fact that they have different emission standards under §1037.105 and are parts of different averaging sets. However, the heading of that section (§1037.230(a)(1)) explains that families are established for vehicles that are in the same regulatory sub-category (“or equivalent in the case of vocational tractors”).

§1037.630(b)(2) states that, while these vocational tractors must be certified as a separate vehicle family, they must remain part of the vocational regulatory subcategory and averaging set for their weight class. Since class 7 vocational tractors belong to the MHD vocational vehicle sub-category and class 8 vocational tractors belong to the HHD vocational vehicle sub-category (§1037.230(a)(1)), these should not be grouped together in the same vehicle family.

For incomplete vehicles a sister vehicle can be selected. What are the recommended criteria for selecting a sister vehicle? Is inertia weight a required criteria, or does inertia weight not matter when designating a sister vehicle?

§1037.150(l)(2) and (3) provide the criteria for determining a valid sister vehicle-- either a complete vehicle of the same configuration, or one of a different configuration due only to factors unrelated to coastdown performance. It also allows for a mocked up sister vehicle that is not offered for sale. The preamble further clarifies that a vehicle sold by (completed by) a secondary manufacturer can qualify. (76 FR 57260, September 15, 2011)

The sister vehicle concept does not lend itself to crystal clear a priori definitions. Manufacturers will have to work with their certification representative on a case-by-case basis because it is not possible to envision all situations ahead of time, and we want the provision to be robust-- useful to the OEMs but equally successful in getting at real emissions performance.

We are allowing use of the sister vehicle concept for incomplete vehicle certification to include the selection of sister vehicles not actually produced for sale by the certifying manufacturer. A majority of the time the sister vehicle will be the complete pickup truck or van from which the cab-chassis vehicle is derived. However:

- If the complete sister vehicle ceases production but the corresponding incomplete vehicle does not, a manufacturer may continue to use the sister vehicle emissions data through the carryover process that is already practiced today.
- If carryover is not appropriate because of, for example, an emissions-impacting recalibration of the engine, the manufacturer may conduct new emissions testing using the coastdown data collected on the original sister vehicle. This would still save substantial effort without sacrificing quality as coastdowns are less affected by engine changes.
- Where no sister vehicle exists because the manufacturer does not sell a related complete vehicle, the manufacturer may coastdown a mocked-up vehicle made from its incomplete vehicle and an added open or closed cargo box that simulates a complete van or pickup truck, or may coastdown one of its customers' completed vehicles.

Timing for GHG vehicle code digit for EPA Vehicle Family Name

From Guidance Letter CD-12-02: EPA Standardized Naming Convention for Model Year 2013 and Later Heavy-Duty Highway Vehicle Family Names (issued 01/12/2012):

Position 5: Industry Sector Code

2 – Complete Heavy-Duty Highway Vehicles (>14,000 pounds GVWR)

Positions 6-9: Vehicle Type

VOCV – Vocational Vehicle

TRAC – Tractor

Will compliant vehicles require additional external certification graphics?

The Agencies are not requiring manufacturers to affix additional external certification labels (graphics) on their vehicles. External labels have proven to be valuable in providing a fair comparison to consumers in the light-duty market when shopping and comparing vehicles. However, for this rule, we are not providing consumer based labels. We are requiring emission control information labels for all Heavy Duty (HD) engines and vehicles, as specified in §1036.135 and §1037.135.

HD Pickups and Vans:

Vehicles in this sector currently have vehicle emission control information labels showing compliance with criteria pollutant standards. Per 76 FR 57260 [(2) Labeling Provisions], we believe the existing label is sufficient at this time. For further guidance, see [Dear Manufacturer letter # CISC-06-19](#).

HD Engines:

Engines in this sector will use the existing HD Engine label and will add the additional information to comply with the HD GHG regulations as described in §1036.135.

However, §1036.130(b)(7) does require the engine manufacturer to provide installation instructions to the vehicle manufacturer stating: “If you [the vehicle manufacturer] install the engine in a way that makes the engine’s emission control information label hard to read during normal engine maintenance, you must place a duplicate label on the vehicle, as described in 40 CFR 1068.105.”

HD Combination Tractors and Vocational Vehicles:

Vehicle labeling will be new to this sector. §1037.135 defines the vehicle emission control information label requirements for HD vehicles covered by this rule, including that it should be, “... Secured to a part of the vehicle needed for normal operation and not normally requiring replacement.” This label must be affixed permanently to the vehicle in an area that is clearly visible to the owner/operator.

Because it is not a consumer label, it need not be attached externally to the vehicle. Several manufacturers have referred to this as a “door label”. Although the regulations are silent on where to locate the label, a vehicle door seems to be a logical location. The purpose of this label is to assure owners/operators that their new truck purchase has the appropriate emission control components. It also provides a ready reference to field inspectors, assisting them to identify whether a vehicle is in its certified configuration.

As stated above, per §1036.130(b)(7), engine manufacturers will provide installation instructions to vehicle manufacturers warning them that if they install the engine in a way that makes the engine label hard to read, they must place a duplicate label on the vehicle, as described in §1068.105

General - Averaging, Banking and Trading:

EPA approval of innovative technology credit test plans may be required well in advance of typical certification preview meeting timing. Do EPA Ann Arbor and Washington DC staffs have a process in place to review and approve these plans?

Yes. EPA and NHTSA jointly review and approve innovative technology requests. We encourage manufacturers to approach us as early as possible in the process. Per §1037.610(d), we recommend you do not start collecting test data before you contact us to review your recommended test plan.

EPA has stated with regard to GEM that “transmission improvements could potentially be evaluated as an innovative credit and thus be utilized for demonstrating compliance on that basis.” Although the final regulation is “recent,” has EPA undertaken any additional steps “post final rule” with regard to transmissions and innovative credits?

We will approach this as a typical innovative technology request from a manufacturer as explained in §1037.610 and 49 CFR 535.7. These provisions may be applied for CO₂ emission and fuel consumption reductions provided the test procedures used to generate inputs for GEM do not already consider the benefit of the subject technology. The provisions also allow the improved technology to be used as either an improvement factor (i.e., improvement over base-line configuration), or as a separate credit (e.g., comparing in-use emission rate with and without the technology on the same or identical vehicle).

Note that per §1037.610(d), you must send a request that includes a detailed description of the technology and a recommended test plan to EPA's DCO (the DCO has directed that your request should go directly to your certification representative). §1037.610(d) goes on to state, "... For technologies for which the engine manufacturer could also claim credits (such as transmissions in certain circumstances), we may require you to include a letter from the engine manufacturer stating that it will not seek credits for the same technology." We recommend you do not start collecting test data before contacting us. Use the guidance in §1037.610 to inform what testing data and other information must be submitted to EPA for joint EPA/NHTSA review.

Projected production weighted average was not included in final rule, nor was the requirement for that weighted average to meet the standard. Please explain why this is now different.

§1037.725(b) requires that manufacturers include in their application a statement that to the best of their knowledge they will not have a negative balance of emissions credits when all emissions credits are calculated at the end of the year, or a statement that they will have a negative balance as allowed under §1037.745. Your certificate for a vehicle family for which you do not have sufficient CO₂ credits will not be void if you can offset the deficit by using surplus credits within 3 model years.

§1037.205(s) states that manufacturers must submit good-faith estimates of U.S.-directed production volumes by subfamily. This input is included in the Family Information worksheet of the HD GHG Vehicle Template.

We are not requiring that you submit detailed calculations beyond that submitted in the GEM output file in your application (See §1037.205(o)). However, per §1037.735(a), you must organize and maintain all records that form the basis of your credit determination. §1037.735(b) goes on to state, "You may not use emission credits for any vehicles if you do not keep all the records. We may review your records at any time." Finally, you may store these records in any format on any media as long as you can promptly send us "organized, written records in English, if we ask for them."

Advanced Technology or Innovative that has an override switch or mechanism, can the FE credit be taken despite the override function?

Emissions and fuel consumption credits for these technologies have to be evaluated on a case-by-case basis. Manufacturers must provide data indicating how often the technology will

be used in practice and conditions under which it will be overridden. Per §1036.610(b)(3), §1037.610(b)(3) and 49 CFR 535.7 (by reference to §1037.610), the agencies may require you to discount the benefit of this technology if, based on the information provided, the amount of time the system is expected to be overridden is significant.

As a tier 1 supplier, do you need an OEM sponsorship to determine credits for an innovative technology?

Innovative technology credits for CO₂ emissions and fuel consumption apply to engine and vehicle configurations covered under a certificate issued by EPA. Thus, the credits are available to the certifier of the engine or vehicle which contains the innovative technology. The certifier generally has substantial control over the design and assembly of emission controls. This is usually the engine or vehicle manufacturer, however, in some limited cases the certifier can be a secondary manufacturer using the provisions set out in §1037.620(b).

General - Hybrids and Heavy-duty OBD:

What will be the process for adding new vehicle families during the year? For instance, adding a new hybrid system?

If the engine manufacturer is the certifier, Part 1036 Subpart C defines the process to certify. Note that §1036.230(a) states that engines that are certified as hybrid engines or power packs may not be included in an engine family with engines with conventional powertrains. Therefore, hybrids will have to be in a separate engine family.

If the vehicle manufacturer is the certifier, Part 1037 Subpart C defines the process to certify. Note that §1037.230(a)(2)(ii) states that you should group together vehicles that contain the same advanced technology (i.e., hybrids) into one vehicle family.

Please confirm that the engine by itself does not need to be certified for GHG if it will be used as part of a hybrid system that is certified for GHG [See 76 FR 57249, top of first column and bottom of first column which seem contradictory]?

These two statements in the preamble are not contradictory. At the top of 76 FR 57249 we state that hybrid engines and vehicles certified under the provisions for GHG will use certified engines (i.e., engines certified for criteria pollutants). At the bottom of 76 FR 57249 we state that the engine will need to be certified for criteria pollutant performance, while the engine and hybrid system in combination may be certified for GHG performance (i.e., to capture the benefit of hybrid operation on GHG emissions).

Therefore, the engine must be certified for non-GHG emissions if the engine is certified as an engine independent of a vehicle. If the engine is certified for GHG emissions as/within a complete vehicle (or as a combined engine and hybrid system), then a second independent engine

certification (i.e., to GHG pollutants) is not needed. If the engine is not certified as/within a complete vehicle (e.g. the vehicle certification is independent of the engine's emissions performance) then the engine must be both GHG and criteria pollutant certified.

How will the Running Change process be handled? Will notification be required to NHTSA also? What about changes that need individual submission (such as Hybrids)?

Refer to §40 CFR 1036.225 and 1037.225, and 49 CFR 535.8(f) which outline the requirements for amending applications for certification for GHG and fuel consumption regulated engines and vehicles. This is a similar approach to the running change process used today for engine criteria pollutants.

A hybrid system cannot be added to an engine family that uses a conventional powertrain under the running changes criteria. Running changes are allowed within a hybrid engine or hybrid vehicle family using the criteria in §1036.230 and §1037.230.

Running change applications are to be submitted to EPA only and must include the required information for both EPA and NHTSA. Manufacturers can start production as soon as they submit the running change application (provided the family is already covered under a certificate). The caveat is that they must cease production and possibly recall if we deny the running change as described in 40 CFR 1036.225(e) and 40 CFR 1037.225(e).

Turnaround time for approvals on Running Changes involving Hybrids?

The timing of agency approval/denial of running changes will depend on the complexity of the running change as well as the completeness of the data submission by the manufacturer. Incomplete submissions will result in increased review times.

As described in the previous answer, §1037.225(e) and §1036.225(e) provide some relief for manufacturers who wish to start production while the agency reviews their running change application.

Hybrid battery deterioration was used as an example of deterioration factor applicability for vehicle certification. How will EPA define/approve DF test practices for vehicle components?

This example was used in §1037.241(c). Should manufacturers (or EPA) determine that a non-zero deterioration factor is appropriate; the manufacturer must devise and execute a test plan consistent with good engineering judgment that provides a reasonable estimation of the difference between the tests point at which the highest emission levels occur and the low hour test point. EPA recommends that manufacturers work with their certification representatives at all steps in the process to avoid unnecessary testing and ensure the end result is relevant.

Class 4/5 – HD hybrid requirements for intermediate manufacturer (overlaid hybrid system). Need additional clarification?

Manufacturers of hybrid systems are not required to be the certifier. However, should they choose to certify they should work with either the engine manufacturer or the vehicle manufacturer to determine the extent to which the certificate will cover a given engine or vehicle family. Whether certification is based on pre-transmission powerpack system (engine and hybrid system), post-transmission powertrain system (transmission and hybrid system), or vehicle certification testing, the certificate holder has the responsibility to ensure compliance for the useful life of the engine or vehicle, depending on the nature of the certificate. §1036.108(d), §1037.104(e), 105(e) and 106(e) state, “Your vehicles must meet the exhaust emission standards of this section throughout their full useful life, expressed in service miles or calendar years, whichever comes first”. Performance of systems and subsystems are the responsibility of the certificate holder and any failures in subsystems that impact the certificate holder’s ability to comply with the standards are a matter of the contractual relationship between those companies and not with EPA. EPA will hold the certificate holder responsible for the certified system’s full useful life performance (see §1036.750 and §1037.750; and 40 CFR 535.9).

What are the emissions and OBD requirements and certification procedures for HD & MD hybrid powertrain suppliers for vocational vehicles?

Emission standards are only applicable to Certificate holders for engines or chassis. OBD requirements for hybrid systems are applicable starting in MY2016 for new systems and MY2017 for legacy systems. For a more detailed discussion, please see 40 CFR 1036.525, 1037.525 & 550, 1037.615; and, §86.101-18(q); and, 76 FR 57269-57271.

For Engines- please confirm “non-OBD” really means “OBD for >14k”?

Yes, that is correct. See §1036.150(f).

In the peer review of the GEM, Dr. Flowers indicated that “the use of a generic powertrain (engine and transmission) is problematic because a well-integrated powertrain can significantly improve vehicle performance.” While this meeting is focused on existing standards, could you address for a moment where EPA may be heading with further development of the GEM as a compliance mechanism especially with respect to the consideration of transmissions and powertrains?

As we noted in the preamble to the final rule (76 FR at 57133, September 15, 2011), we will fully consider a range of regulatory approaches in the next phase of a heavy-duty GHG rulemaking, which include the potential to expand compliance models to reflect engine and transmission performance.

In a presentation given by the HMRC during SAE's 2011 OBD Symposium, there was mention of EPA's action to extend the hybrid heavy-duty OBD compliance date to 2016 for new systems, and 2017 for legacy systems (slide 10 of the presentation)?

To answer your question, the statement in the presentation is correct. However, there is some additional information to put this statement in context.

EPA has addressed your question in the document called, "Implementation Work Shop Questions and Answers, Fourth Edition (PDF)". The response stated:

"Emission standards are only applicable to Certificate holders for engines or chassis. OBD requirements for hybrid systems are applicable starting in MY2016 for new systems and MY2017 for legacy systems. For a more detailed discussion, please see 40 CFR 1036.525, 1037.525 & 550, 1037.615; and, §86.010-18(q); and, 76 FR 57269-57271."

Your question is also addressed in the EPA/NHTSA Final Rule entitled, "Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles" (hereafter referred to as HD GHG Final Rule) issued on September 15, 2011. The HD GHG Final Rule preamble language (pages 76 FR 57269-57271) describes our decision. Read the entire section entitled, "*Onboard Diagnostics*". Brief summary:

- EPA is extending the OBD phase-in for engines with hybrid systems to allow time for manufacturers to address communication protocol development concerns, component development concerns (e.g. hardware and software), and to address the availability of heavy duty OBD compliant engines with sufficient lead-time for additional hybrid diagnostic system development.
- Diagnostic systems are currently being developed based around components and systems that influence criteria pollutant emissions. Consistent with the light-duty 2012–2016 MY vehicle rulemaking, we believe that monitoring of these components and systems for criteria pollutant emissions will have an equally beneficial effect on CO2 emissions. Therefore, we have not finalized any additional unique OBD provisions for heavy-duty GHG emissions.
- Manufacturers that plan to put hybrid engines/trucks into production before MY2016 will be required to implement feasible controls such that these hybrid systems do not adversely impact [criteria] emissions performance beginning in MY2013 through MY2015, as well as MY2016 engines used with hybrid powertrain systems that were offered for sale before January 1, 2013.
- See §86.010-18(q) entitled, "Optional phase-in for hybrid vehicles" (See HD GHG Final Rule, pages 76 FR 57374-75) for more specificity concerning hybrid requirements and implementation schedule with respect to OBD during the phase-in years.
- Hybrid systems put in production after January 1, 2013 are required to meet the full HD OBD requirements in the 2016 model year (consistent with the next phase-in date for HD OBD), while those hybrid systems released prior to January 1, 2013 have until the 2017 model year to be compliant with the full HD OBD requirements.

- The HD GHG Final Rule preamble states that, “If a manufacturer certifies an engine-hybrid system with CARB OBD in California prior to the required phase-in date (MY2016 or MY2017),, the manufacturer must either use the CARB certified package for Federal release or phase in the package and certify it with full EPA OBD (See 76 FR 57271). The preamble also states: “the engine-hybrid system must maintain existing OBD capability for engines where the same or equivalent engine (e.g. displacement) has been OBD certified.”

For access to the HD GHG Final Rule document, use the following URL, and then scroll down to the Heavy Duty Regulations section.

www.epa.gov/otaq/climate/regulations.htm

To access the electronic Code of Federal Regulations, use the following URL:

<http://ecfr.gpoaccess.gov/>

General - Exemptions:

Airport Rescue Fire Fighting vehicles are used on airports. They must have the mobility to operate off the runway, but are not limited to low speeds, nor would they fit the other criteria of the off-road exemption. Many are manufactured with non-road engines because the on-road engines do not produce sufficient horsepower and torque to meet the NFPA 414 and FAA performance criteria. Are manufacturers of these vehicles required to submit a petition for exemption?

§1037.5 states that, “..., this part does not apply to the following vehicles: (a) Vehicles not meeting the definition of ‘motor vehicle’ ”. Per the criteria stated in §85.1703, entitled Definition of a motor vehicle, the agencies would determine that this vehicle configuration would not be a motor vehicle. Thus no petition would be required and this vehicle configuration is not covered under our highway vehicle and engine standards.

What will be the process for requesting and reporting Exemptions?

For off-road exemptions under §1037.150(h), the manufacturer must meet the conditions in §1037.631(a) to be exempted without request. This section does not exempt the engine used in the vehicle. Also, you may not include any exempted vehicles in any credit calculations under this part. Within 90 days after the end of each model year, you must send EPA a report with the information spelled out in §1037.631(c)(3).

For imports exemption issues, go to the Imports helpline (imports.epa.gov). For all other issues see your certification representative.

General - Hardship:

In the event of a severe economic market change that drastically impacts net vehicle sales, is the EPA empowered to grant exemptions from GHG rules where a severe economic hardship to comply exists?

There are no exemptions that can be granted due solely to economic conditions. However, §1037.745 provides manufacturers the ability to carry an emissions credit deficit for up to 3 years, which provides manufacturers with flexibility to adapt their product mix to the market conditions.

In the event of a catastrophic natural disaster (earthquake, tornado, flood, etc.) to an OEM's production capacity affecting model mix and net vehicle production, is the EPA empowered to grant exemptions from GHG rules where a severe economic hardship to comply exists?

There are no exemptions that can be granted due solely to economic conditions brought on by natural disasters. However, §1037.745 provides manufacturers the ability to carry an emissions credit deficit for up to 3 years, which provides manufacturers with flexibility to adapt their product mix to the market conditions.

General - Future Rules:

Do you expect any technical corrections to the final rule or supplemental rulemakings? If so, when might these be published?

A number of technical corrections will be addressed in an upcoming rulemaking.

In the final rule, the Agency stated that chassis dynamometers may not only be utilized for compliance, but as a method to develop the stringency in additional rulemakings. Is EPA planning to further review the use of dynos going forward? Since resource constraints will likely still exist within the timeline for follow-on rules, could we conclude that dynos would likely be used for the development of new standards rather than implementation of new standards?

We are committed to fully considering a range of regulatory approaches for the next phase of regulations (see 76 FR at 57133, September 15, 2011). At this time, the agency is not in a position to predict what methods may be available for testing HD vehicles in the future.

Are you intending to form stakeholder groups to either further review (a) implementation of the final rule or (b) development of follow-on rules that are contemplated in the final rule?

a) We will convene additional stakeholder groups or workshops as necessary to fully implement this Final Rule.

- b) We are not in a position yet to discuss how follow-on rules will be carried out, however, we expect there would be opportunity to work with all stakeholders.

We realize this session is about near-term compliance and early certification. Would you be planning any additional sessions regarding the final rule – such as advanced technology and innovative technology credits?

We recommend you contact your EPA certification representative for any issues/questions you may have with respect to advanced or innovative technologies. We will consider additional sessions as needed to assure successful implementation of this rule.

HEAVY DUTY PICKUPS & VANS:

No specific questions concerning HD Pickups and Van have been completed to date. See general questions.

HEAVY DUTY ENGINES:

HDE Averaging, Banking and Trading:

For Engines- Are low N₂O credits available for MY13 cert?

If you certify your model year 2014, 2015, or 2016 engines to an N₂O FEL less than 0.04 g/hp-hr, and provided your FEL is based on measured N₂O emissions from your emission-data engines, you may generate additional CO₂ credits by using the equation in §1036.150(i). Use this equation in lieu of the equation in §1036.705.

Please confirm that for engines certified to alternate phase-in of 1036.150(e), we are still allowed to generate “regular credits” (no 1.5 multiplier) for MY13 and later, just not “early credits” (1.5 multiplier).

You are correct. 76 FR 57501(February 15, 2011) states that, if a manufacturer chooses to use the alternative phase-in schedule to meet EPA standards and chooses to comply early with the NHTSA fuel consumption program, then the engines certified to these standards are not eligible for early credits [see 40 CFR 1036.150(e), 49 CFR 535.5(d)(5) and 535.7(d)(13)].

40 CFR 1036.150(e) and 49 CFR 535.7(d)(13) state that engines certified to the alternative phase-in schedule are not eligible for early credits that may be increased by a multiple of 1.5 [as allowed in 40 CFR 1036.150(a)(3) and 49 CFR 535.7(d)(14) for engines meeting the regular standards and associated schedule]. 40 CFR 1036.150(e) and 49 CFR 535.7(d)(13) go on to state that credits for these engines are calculated using the table provided in paragraph §1036.150(e), and the equation provided in 49 CFR 535.5(d)(11). These two cites do not provide a multiplier.

If I am certifying more than one power level for an engine, in order to use AB&T, am I required to both: a) test each power level?; and, b) place each engine power level into separate engine families?

ABT credits are calculated based on the Family Certification Level (FCL) of the engine family. 1036.241(a) states that an engine family is in compliance if the tested configuration(s), as defined in 1036.235(a), has (have) emission levels at or below the FCL. Per §1036.230 (referencing 40 CFR 86.001-24, which then references 40 CFR 86.096-24), an engine's power rating is not a family-determining characteristic. Therefore, you may include multiple power ratings within a single engine family.

The NO_x/PM ABT is very different from HD GHG reporting. The difference is especially the need to report every serial number and every configuration which discourages agglomerating similar vehicles into one family. Is EPA prepared for a flood of GHG family certifications?

We believe the vehicle family structure that was finalized represents the most expedient method for reconciling credits while reducing reporting burdens (see §1037.230). For each regulatory subcategory, each manufacturer needs to only have one vehicle family (for conventional vehicles). Differences in GHG performance are accounted for at the subfamily level and differences in GHG-related components are accounted for in the vehicle configuration level. The GEM-predicted emission level can be calculated using the EPA-supplied batch processing template at the vehicle configuration level. Manufacturers must only associate each VIN with a configuration, rather than enter each VIN in GEM.

COMBINATION TRACTORS & VOCATIONAL VEHICLES:

Certification:

What level of detail must be reported to EPA with respect to the OEM definition of Vocational Tractor?

In order for a vehicle to be reclassified as a vocational tractor, it must meet the definition in 40CFR1037.630(a) and 49CFR523.2, meet the requirements in 40CFR1037.630(b) and 49CFR535.5(c)(5), and include the language required to be added to the vehicle's emission control information label specified in 1037.630(c). In addition, there are production limits for vocational tractors. No manufacturers may produce more than 21,000 vehicles under 1037.630(c) in any three consecutive model years. No pre-approval is normally required for on-road vocational tractors. A manufacturer is only required under 1037.630(b) to include in its application for certification a brief description of its basis for reclassifying certain of its tractors as vocational, citing the applicable vehicle and application types enumerated in 1037.630(a)(1). As specified in 1037.630(c), the manufacturer must keep records for three years to document its basis for believing the vehicles will be used as described in 1037.630(a). In the future, if EPA determines that a manufacturer is not applying the allowance in good faith, it may require the manufacturer obtain preliminary approval before using the allowance.

What level of detail must be reported to EPA with respect to the OEM definition of Off Road Vehicle?

There is no requirement that OEMs obtain approval of off-road status (and consequent exemption from the vocational vehicle GHG standards). Criteria for meeting this exemption are found at 40 CFR 1037.631(a) and 49 CFR 523.2, but the manufacturer must report the basis of its determination by the end of year, as outlined in 40 CFR 1037.631(c) and 49 CFR 535.8(h)(6). However, if the vehicles do not meet the criteria of the definition in the regulation, then the manufacturer may ask for an exemption according to 40 CFR 1037.150(h) and 49 CFR 535.8(h)(6)(ii). EPA will coordinate approval decisions with NHTSA.

We are a corporation made up of several business units or divisions that all produce vocational vehicles. We have at least two divisions that are final stage manufacturers who produce their own chassis. Will we be asking for one manufacturer number for the corporation, or does each division get their own number?

It is normal practice among corporations to use one manufacturer code for all vehicle and engine products regulated by EPA. Therefore, you should use one manufacturer code to encompass all your products regulated by EPA. However, let your certification representative know if you think this approach would be problematic for you.

Likewise, will we average compliance across the corporation for all vocational vehicles, or does the averaging take place only within a division?

The averaging should take place across the corporate product lines. You may average within the following three averaging sets:

- Light heavy duty vehicle line
- Medium heavy duty vehicle line
- Heavy heavy duty vehicle line

Will we get separate vehicle certificates and engine certificates?

For class 2b/3 complete vehicles you will receive a vehicle certificate based on complete vehicle testing. For 2b-8 incomplete vehicles you will receive a vehicle certificate based on chassis modeling. For class 7-8s tractors/vocational vehicles you will receive a vehicle certificate based on chassis modeling. For engines in vehicles not included in the 2b/3 complete vehicle program, which are subject to the engine provisions, you will receive an engine certificate based on engine testing. If you are the manufacturer of both the engine and the chassis, and intend to certify as a vocational vehicle, you will receive an engine certificate based on engine testing and a vehicle certificate based on chassis modeling.

**What data is needed to approve early families? Vehicle Cert Label, GEM confirmation, etc ...?
What data to support GEM Outputs must be submitted? How much back-up data is required to confirm GEM output?**

Before submitting applications for certificate; it is recommended that each manufacturer directly contact its certification representative to discuss those issues for which it needs EPA approval. Note that while §1037.30 directs manufacturers to submit all reports and requests for approval to EPA's designated compliance officer (DCO), the DCO has instructed that each manufacturer go directly to its EPA certification representative to arrange to submit and discuss all information required to facilitate the agency's approval process. It is highly recommended that this be done early to give sufficient time for granting approvals and to avoid wasted application work and testing.

Section 1037.205 and the certification application template provided by EPA will identify all information and data the manufacturer must submit at the time of application. §1037.150 and §535.5(b)(2) and (c)(2) provide guidance specifically for approving early families. The manufacturer is responsible to review the reporting requirements and recordkeeping requirements in the regulations (including 40CFR1037.250, 730, 735 and 825; and 49CFR535.8) to assure it has submitted all required information not identified by the template. Typically these additional documents are submitted in .pdf or other secure format. The manufacturer is also required to keep any backup data and information necessary to support the data and information submitted during application submission.

Below are two questions related to potential implementation scenarios for Tractors.

- **Can a manufacturer run the MY2013 for Vocational vehicles until the end of the 2013 calendar year, can it start MY2014 for Tractors around the mid-2013 calendar year and continue to delay certifying Tractors and implement on the first day of calendar year 2014, based on a flexibility provision in the regulation?**
- **Alternatively, can a manufacturer start MY2014 for all vehicles around the mid-2013 calendar year, become regulated on Vocational vehicles, and continue to delay certifying Tractors and implement them on the first day of calendar year 2014?**
- To begin generating early credits for MY 2013, you must certify all your products within a given regulatory sub-category (§1037.150(a)(1)). This allows you to certify your vocational vehicles on a separate time frame from your tractors. In addition, there is no requirement that you utilize one corporate-wide model year as long as the model year(s) you choose satisfies the definition of "model year" in §1037.801.
- The provision regarding uncertified MY2014 vehicles is described in the preamble to this rule (76 FR 57255):

"We are addressing these concerns by finalizing January 1, 2014 as the date certain when manufacturers are required to comply. Prior to this date, certification of the vehicle would be optional. Thus, a manufacturer could produce uncertified model year 2014 vehicles through December 31, 2013."

And codified at §1037.150(g):

“(g) Compliance date. Compliance with the standards of this part is optional prior to January 1, 2014. This means that if your 2014 model year begins before January 1, 2014, you may certify for a partial model year that begins on January 1, 2014 and ends on the day your model year would normally end. You must label model year 2014 vehicles excluded under this paragraph (g) with the following statement: “THIS VEHICLE IS EXCLUDED UNDER 40 CFR 1037.150(g).”

Must a vocational body-builder who builds on a commercial chassis apply for a certificate of conformity, or is this the responsibility of the commercial chassis manufacturer?

Under normal circumstances, we would expect the chassis manufacturer to be the certifier. However, if the chassis manufacturer chooses not to certify, then it must follow the provisions in §1037.620 and the body builder would have to certify the vehicle.

If a vocational body-builder adds axles to a commercial chassis, who reports on this, the bodybuilder, or the commercial chassis manufacturer?

The only inputs to GEM for vocational vehicles are the rolling resistance of the steer and drive tires. Assuming the chassis manufacturer is the certifier, if a body builder adds an axle, then they must include tires with a rolling resistance level less than or equal to the rolling resistance value used for the drive tires in certification. The chassis manufacturer should provide the information to the body builder which is required to ensure it remains in its certified condition.

If a vocational body-builder stretches a wheel base on a commercial chassis, who reports on this, the bodybuilder, or the commercial chassis manufacturer?

Wheel base is not reported as part of the certification application.

Aerodynamic Drag:

Aerodynamic drag data – all evaluations cannot be completed in time for cert application submission or new variants or models are anticipated or in process but we cannot generate final aero assessment. As a result, will EPA allow placeholder information for Aerodynamic drag data during the certification process if it is updated during the course of the model year? The new data would be used for year-end and final compliance reporting. If so, what process will be used? Does all info need to be in before Certificate is issued? Can there be gaps in Aerodynamics data? Is there an opportunity to update information? Do we need to supply the CdA test on our GEM input file if we already supply the Bin? (bins are easy to calculate for every vehicle, but CdA's are difficult)

Manufacturers have expressed concern that the time needed to secure approval for alternative aerodynamic demonstration methods and generate the needed data will cause delay in certification of vehicle families before the 2014 model year. While application data using manufacturer selected FELs and projected production figures can be used by the agencies as an indicator of what to expect, no final compliance determination or final credit determination can be established until the end of the model year and would have to be based on actual vehicle configurations and production data.

Therefore, for manufacturers wishing to certify vehicle families for the 2013 model year, where a manufacturer can use existing aerodynamic data and good engineering judgment to establish reasonable bin assignments for all of its vehicle families, but has insufficient time to generate the necessary data through coastdown and alternate methods before the model year production begins, EPA can apply §1037.521 which allows manufacturers to determine drag area using an alternate method, and §1066.10(c) which states, "...We [EPA] may allow or require you to use procedures other than those specified in this part for laboratory testing, field testing, or both, as described in 40 CFR 1065.10(c).... If we require you to request approval to use other procedures under this paragraph (c), you may not use them until we approve your request."

EPA has determined that, for vehicle families that a manufacturer chooses to certify for the 2013 model year, should a manufacturer require additional time to generate all the required data, we will allow the manufacturer to submit, as part of its application, any data and/or information that they have and their rationale showing that good engineering judgment assures their vehicle configuration assignments to Aerodynamic Bins for all their GEM model runs are accurate. If EPA agrees with the manufacturer's assessment as submitted, we can approve the certification application.

Therefore, for 2013 model year vehicle families, manufacturers will not be required to generate all data before receiving their certificate. However, manufacturers using this approach will be required to carry out the requisite testing during the model year, such that all required data is reported to EPA in the end-of-year report, at which time any early credits earned will be allocated. Since no credit deficits can be generated in model year 2013, there is no risk to the environment should testing not be completed; credits would simply not be earned by the manufacturer. While §1066.10(c) states that we may allow you to continue to use this process beyond the 2013 model year, it is our expectation that this will be unnecessary in model year 2014 and beyond because, as just explained, manufacturers will have established test programs that allow them to generate the required data. The agencies expect manufacturers to have sufficient aerodynamic data to perform and submit the GEM inputs and outputs at the time of application for certificates for model year 2014 and beyond.

For the 2014 model year and beyond, there are minimum test data requirements to run the GEM model, using the direction in §1037.520 and §1037.521. Per §1037.205(o), at the time the manufacturer applies for certification, it is required to submit GEM assessments from 10 unique GEM configurations. It is required to include configurations with the best CO₂ emissions, worst CO₂ emissions, and 8 additional GEM runs that should include a configuration representing the highest projected sales volumes. The manufacturer must have sufficient aerodynamic data to support these GEM runs.

- If manufacturers must meet the 10 GEM run requirement using configurations that, based upon good engineering judgment, are substantially aerodynamically equivalent, they may base the Cd input for GEM on the same aerodynamic testing/assessment.
- If manufacturers prefer to use an alternative aerodynamics test method, they must test a vehicle over both the coastdown test method and the alternative test method preferred by the manufacturer (e.g., wind tunnel testing, computational fluid dynamic modeling or constant speed road load testing) to generate its correction factor. The manufacturer can then make alternative method assessments that have been corrected back to the coastdown “baseline” method using this correction factor in lieu of additional coastdown testing. §1037.521(c) states, “You must obtain preliminary approval before using any methods other than coastdown testing to determine drag coefficients. Send your request for approval to the Designated Compliance Officer [DCO].” Again, the DCO has instructed that you send your request for approval directly to your EPA certification representative.
- If manufacturers determine that a new sub-family is warranted during a model year, then they must file a running change including all relevant test data.

What is the approval process for a manufacturer to request an Alternative Aerodynamic Demonstration procedure?

A request to EPA to use an alternative aerodynamic method should include the following:

- You (the certificate requestor) should first contact your certification representative (as delegated by EPA’s DCO) to state your intention to request use of an Alternative Aerodynamic Demonstration procedure. At this point, you should provide a technical description of your proposed alternate method and your plan for validating this method against coastdown testing.
- Per §1037.521, you must obtain preliminary approval before using any method other than coastdown testing, and describe how to adjust the drag area provided by the alternative test method to be equivalent to the corresponding drag area that would have been measured using the coastdown procedure. You must keep records of the information specified in §1037.521(c) and unless directed otherwise, include this information with your request for approval to the DCO. In this case, the DCO has instructed that you send your request for approval, to your assigned certification representative.
- Your certification representative will convene appropriate EPA staff to provide technical support in evaluation of the proposed alternative aerodynamic test method.

What level of detail will EPA require for vehicle height data and calculation for Regulatory Subcategory determination?

You must keep records of these and other relevant certification data and calculations per EPA Reporting and Recordkeeping requirements provided in 40CFR1037.825 as well as NHTSA Reporting Requirements provided in 49CFR535.8(h). However, with regards to what needs to be submitted in the certification application, it will be sufficient to identify your vehicle as either a high, low, or mid roof tractor. Manufacturers must determine the roof height of tractors in accordance with §1037.801.

For determining Low and Mid-roof aero relative to §1037.520 (b)(3), the bin for the low and mid-roof sleepers is assigned “based on the drag area bin of an equivalent high-roof tractor”. The question is, does an “equivalent high-roof tractor” mean:

1. Pick one model/high-roof sleeper configuration to represent the entire family (Model 386 with 70” sleeper is used for all other model and sleeper combinations), or
2. Pick one high-roof sleeper configuration to represent the entire model within the family (70” sleeper is used for all other sleeper lengths on the Model 386), or
3. Use the high-roof sleeper version of the low or mid-roof sleepers on each model for determining low and mid-roof aero bin (70” sleeper on Model 386 is used only for the 70” low and mid-roof sleepers on Model 386 tractors)?

Use the high-roof sleeper version of the low or mid-roof sleepers on each model for determining low and mid-roof aero bin (70” sleeper on Model 386 is used only for the 70” low and mid-roof sleepers on Model 386 tractors).

Will EPA need to witness coastdown testing?

No. However, the manufacturer may want to submit its coastdown test plan to its certification representative prior to testing.

§1037.140 requires nominal design roof heights to be included on the door label. This section notes using the average of the smallest and largest tires offered for the model in the calculation. Is the same approach to be used for rear suspension heights, frame rail section/height, and cab mounting heights?

§1037.140 does not require any labeling for the exact roof heights and/or weights. §1037.135(c)(4) requires that the regulatory subcategory be included on the label (e.g., “Class 8 High Roof Sleeper Cab”). The manufacturer should consult the definition of “Roof Height” in §1037.801 for selection of the appropriate regulatory subcategory.

Refined definitions for Emission Control System description codes for door label for Aerodynamic Components:

- **ATS:** does an under cab fairing only qualify, or does it take a mid-chassis section also, or if it full fairings only (wheel-to-wheel)? How do full fairings on one side and partial fairings on the other fit in (leaving open space for an APU)?
- **TGR:** how long does the gap reducing fairing need to be to qualify or does it just need to exist per OEM definition?
- **ARF:** Does a full height sleeper roof require this code or is it just for add on fairings?

§1037.135(c)(6) requires that manufacturers include the label identifier abbreviation for all vehicle emission control components they use in or on their vehicles as specified in Appendix III to Part 1037—Emission Control Identifiers. Since the intent of these identifiers is to provide inspectors with a means for simply verifying the presence of a component, we do not believe

overly detailed identifiers are necessary, particularly for tires and aerodynamic components. We believe that identifying tires and aerodynamic components in a general sense will prove similarly effective in determining if a vehicle has been built as intended or if it has been modified prior to being offered for sale. Please contact your certification representative if you do not find a suitable label identifier for your chassis emission control system in Appendix III.

Tire Rolling Resistance:

In the vocational Subcategory there are many small manufacturers for vehicles but only a few big tire manufacturers.

- a) What is the tire manufacturer's responsibility to provide tire data to the vehicle manufacturers?
 - b) What is the procedure if the tire data is not available in a timely manner from the tire manufacturer?
 - c) **Tire CRR Database:** What is EPA's plan to harmonize the data if the same tire shows different results? The tire manufacturers data appears to be mostly relevant to a broad range of vehicle OEM's. Would it not be beneficial to the EPA's GHG certification process to streamline tire rolling resistance data into a common database possibly managed through an industry group like Truck & Engine Manufacturer's Association or the Tire Manufacturers Association? Will EPA or NHTSA be developing and maintaining a data base of certified tire CRR values, or will each vehicle OEM needs to work with each tire manufacturer to identify the valid values? If EPA does not maintain this data base, how will vehicle manufactures validate the CRR values they are using in their application?
- a) The certificate holder (i.e., the chassis manufacturer) is responsible for establishing agreements with tire manufacturers for the proper collection of tire data to provide to EPA. According to §1037.650, tire manufacturers providing such data to vehicle manufacturers are liable for the accuracy and representativeness of the test data.
 - b) If the tire manufacturer does not submit tire data to the chassis manufacturer, the vehicle manufacturer should make alternate arrangements to develop or obtain tire data on their own and in accordance with §1037.520(c).
 - c) EPA and NHTSA do not intend to establish a common database at this time. Consideration may be given in the future. However, the agencies may conduct confirmatory testing (e.g., if we observe outlier data from the same tire model). §1037.520(c)(1) states that tire rolling resistance be measured, "... as specified in ISO 28580 (incorporated by reference in §1037.810), except as specified in this paragraph (c)." Use good engineering judgment to ensure that your test results are not biased low. You may ask us to identify a reference test laboratory to which you may correlate your test results." (See the next question for further agency guidance with respect to tire test laboratories)

Are there Recognized test labs for Tire RR? Has the reference facility for determining tire rolling resistance per ISO28580 been determined? Who are they? How will tire manufacturer's CRR values be checked to verify that they correlate with the standard labs? What

will the impact be for the use of the designated Smithers-Rapra and Standards Testing Laboratories for CRR measurements, lab alignment, correlations, and stability over time?

At this time, EPA and NHTSA are unaware of any laboratories with a reference machine that has been certified specifically for use with the ISO 28580 test protocol. NHTSA has active ongoing research to identify suitable references labs to the ISO test procedure. Pending completion of the NHTSA research, it is possible that the agencies will identify the appropriate reference lab. However, at this time, EPA and NHTSA have test results showing that two independent tire testing laboratories in the United States, Smithers-Rapra and Standards Testing Laboratory, have tire rolling resistance test machines that correlate well to each other. Both these independent laboratories have been used by the federal government and by industry to conduct tire testing for other federally-mandated programs. Therefore, until ISO certified tire machines are available, should a manufacturer request a test laboratory to which it may correlate its test results, the agencies will accept tire data generated by or correlated to either of these two laboratories. In addition, should either agency decide to confirm or compliance test tires so certified, the agency will use one of these two laboratories for the testing.

Tire Rolling Resistance data (CRR) – Suppliers cannot complete testing in time for cert application submittal so will use existing test data or interpolated data. Will EPA allow placeholder information for Tire Rolling Resistance data during the certification process if it is updated during the course of the model year? The new data would be used for year-end and final compliance reporting. If so, what process will be used? Does all info need to be in before a Certificate is issued? Can there be gaps in Tire Rolling Resistance data? Is there an opportunity to update information?

There are minimum test data requirements per §1037.520(c) that must be in before a Certificate will be issued. Per §1037.520(c)(1), measure tire rolling resistance (RR) as specified in ISO28580 (incorporated by reference in §1037.810), and use good engineering judgment to ensure that your test results are not biased low. Per §1037.520(c)(2), for each tire design tested, measure RR of at least three different tires of that specific design and size, performing the test at least once for each tire. Sufficient tire RR data/assessments must be available at the time of certification to conduct the 10 GEM runs. If during the year, the OEM wants to offer a tire model that causes the GEM result of the vehicle configuration to go outside of the declared range of subfamily FELs, then they must do a running change. Finally, the OEM must have all of the tire RR information available and input into the appropriate GEM runs for each configuration for the End of Year (EOY) report. The manufacturers must test at least one tire size for each tire model, and may apply engineering analysis assessments for other tire sizes within the same model.

Note also, that §1037.520(c)(3) states that, “If the [vehicle manufacturer] obtains [its] test results from the tire manufacturer or from another third party, [it] must obtain a signed statement from them verifying that the tests were conducted according to the requirements of this part. Such statements are deemed to be submissions to EPA.”

For certain vocational vehicles, they are sold today with tires specified by the customer, by brand, size, and tread pattern. This means that a particular model truck could be sold with any of over 100 combinations of front and rear CRR values. How will we handle this? Is each combination considered a subcategory since each would have a unique FEL value?

Having hundreds of combinations of tires does not mean they each will have unique FELs. For example, a vocational chassis manufacturer should model vehicle configurations with highest and lowest rolling resistance combinations. The spread between these two values will determine the number of subfamilies (and thus FELs) within the family. Manufacturers will then group tires/tire combinations into configurations that meet each FEL.

What level of detail will EPA require for the: (a) Range of tires offered for a given model, and (b) Tire testing and data?

You are required to have sufficient tire CRR data to conduct the 10 GEM runs at the time of certification. If during the year, the truck OEM wants to offer a tire model that causes the GEM result of the tractor configuration to go outside of the declared range of subfamily FELs, then they must do a running change. Otherwise, the OEM must have all of the tire RR information available and input into the appropriate GEM runs for each configuration for the EOY report.

I noticed a requirement for 24,000 miles/2 year warranty on tires? Certain vocational vehicle applications will wear out tires sooner. Large fire apparatus and urban use will wear out tires in 8000 miles. Garbage truck won't make 24,000 miles. How will EPA address this?

The tire must be free from defects during the warranty period, but the regulation does not place a requirement on wear. §1037.120 details the emission-related warranty requirements. The warranty period requires that “(1) It is designed, built, and equipped so it conforms at the time of sale to the ultimate purchaser with the requirements of this part. (2) It is free from defects in materials and workmanship that cause the vehicle to fail to conform to the requirements of this part during the applicable warranty period.” Finally, as we have stated in the final rule preamble (76 FR 57278), “As proposed, tires are only required to be warranted for the first life of the tires (vehicle manufacturers are not expected to cover replacement tires when the original tires displayed no defects as defined above).”

For vocational vehicles, what warranty are you looking for? Since tires are the only variable and they are a consumable item the vehicle warranty will not be applicable to meeting emissions.

In the event the tires are the only emission control component on the vehicle (as in some vocational vehicles), the tire warranty (§1037.120) is all that is required to satisfy this requirement. See also the answer to the preceding question.

What are the criteria for EPA/NHTSA to approve the vehicle manufacturers' tire information to the owners/users/fleets for replacement of low RR tires?

- Question goes to replacement within the tire's emissions warranty period of 2 years or 24,000 miles, and replacement after this time.
- Question goes to the form of the information that is provided to the owners/users/fleets for post emissions warranty useful life for tire replacements, i.e. at this point, any replacement tire can be used regardless of the tire CRR properties.
- What are the tire-related rules concerning the OEM-certification with LRR tires and the possible changing &/or replacing of tires by the owners/users/fleets after delivery?
- What support and/or recommendations might be requested from the tire industry, e.g. models of tire CRR information from other countries, use of SmartWay verified LRR tires, etc.?

Per §1037.125(i) the vehicle manufacturer is required to supply instructions that will enable the owner to replace tires so that the vehicle conforms to the original certified configuration. This can be a list of suggested tire models that have rolling resistances similar to the OE tire (i.e. SmartWay verified tires, etc). This can also be an explanation of what rolling resistances the replacement tires should have and how the owner can determine the rolling resistance value for replacement tires (i.e. tire manufacturer websites, literature, etc). Per §1037.125(h), we expect this information to either be contained in the owner's manual or a supplemental document to the owner's manual.

Are the provisions from the EPA regarding "tampering" of emissions system applicable, especially within useful life/emissions warranty for tires (2 years or 24,000 miles)?

- What are the worn tire aspects and concerns for needed removals?
- What are the provisions available for the use of new vehicles for field evaluation tire placements, e.g. as it is being done today?

Per §1037.125(i) the vehicle manufacturer is required to supply instructions that will enable the owner to replace tires so that the vehicle conforms to the original certified configuration. This can be a list of suggested tire models that have rolling resistances similar to the OE tire (i.e. SmartWay verified tires, etc). This can also be an explanation of what rolling resistances the replacement tires should have and how the owner can determine the rolling resistance value for replacement tires (i.e. tire manufacturer websites, literature, etc). We expect this information to either be contained in the owner's manual or a supplemental document to the owner's manual. See also the answer to the previous question.

What are the criteria for the inclusion of the tires as part of the emissions label on the vehicle?

What are the provisions for the vehicle certifications based on "averaging" of a vehicle line vs. individual vehicle certification labeling: If based on "averaging" the vehicles, what is the expectation for the tire's inclusion on the vehicle emissions label, i.e. average RRc information or the specific RR information for each vehicle, and the whole number of vehicles is documented as an "average" for the certification?

If you use tires that meet the definition of “low rolling resistance” in §1037.801 then you need to indicate this by printing the appropriate abbreviation on the ECI label (see Appendix III to Part 1037). In this case, the label would read LRRR, LRRD or LRRS, whichever is applicable. There is no place to report RRc values on the label.

VSL, AES and Weight Reduction:

Please give an example of how the effective speed limit would be calculated for a distance-based soft top, for example one that allows 50 miles of soft top operation for every 250 miles travelled.

See 1037.640(d)(2) for the maximum number of miles per day and the soft top operation miles per day).

- For day cabs, the maximum number of miles per day of soft top operation = $50/250 \times 394$ miles = 78.8 miles. The STF = $78.8 / 252$ miles = 0.313.
- For sleeper cabs, the maximum numbers of miles per day of soft top operation = $50/250 \times 551$ miles = 110.2 miles. The STF = $110.2 / 474$ miles = 0.232.

What are the requirements and what will be the process for tracking and reporting VSL expiration and soft top? What are the requirements and what will be the process for tracking and reporting AES expiration?

Per 1037.205(o), at the time of certification, you will be required to report VSL and AES modeling results for ten vehicle configurations. Unless EPA specifies differently, this should include the configuration with the highest and lowest GEM modeling results as well as your highest sales configuration. Your EOY reports will require GEM inputs (VSL effective speed, AES, etc.) for each vehicle configuration.

What will be the process if a customer must change the VSL or AES due to change in a vehicles application? See examples:

- VSL - Must be able to set at 65 MPH to make it between terminals in a single shift (originally set at 62 MPH); or, VSL – Second owner is running in states with higher speed limits and sets to 65 MPH for traffic safety (originally set at 62 MPH), or
- AES is set to 5 minutes by the original owner who used an APU during non-driving hours. The original owner removed the APU prior to sale. The second owner does not plan to add an APU on the vehicle but wants to idle the main engine (northern US winter, southern US summer)?

The agencies anticipated issues such as those highlighted by this question and designed the program to allow the expiration of VSL or AES constraints at a mileage determined by the OEM (i.e., the certifier) presumably in response to customer preferences. First owners that desire greater flexibility for resale or alternate use can choose these approaches. However, if these

flexibilities have not been exercised by first owners before vehicle delivery, when the OEM still has the ability to adjust these VSL and AES features, these first owners may find that the resale value and/or flexibility for alternate use of these vehicles could be limited. The regulations are quite clear and provide, as example, that no person may disable a VSL prior to its expiration point or if there is no expiration point. The agencies have logically determined that these same restrictions apply to AES systems. The following discussion of your specific examples will highlight this further.

- (a) To gain credit the certifier must make its VSL system substantially tamper-resistant (see 1037.520(d)), and must ensure that its AES system is generally compliant with the adjustable parameters provisions as stated in 1037.660(d) and as defined in §1037.115(a) with reference to 40 CFR Part 86-22.

This tamper resistant approach should preclude customers from changing VSL or AES settings without the manufacturer's (i.e., original certifier) involvement. Note that certifiers cannot set VSLs to an artificially low setting with the expectation that the customer will adjust it upwards upon delivery. However, if a vehicle has been sold and the purchaser requires some adjustment to VSL settings before the vehicle is delivered to said purchaser, the certifier may make the adjustment and pro-rate the benefit of this change in its EOY Report. There are also VSL soft tops or expiration features that are subject to proration provisions.

In the case of your second owner example, if the vehicle's Vehicle Speed Limiter (VSL) has not reached the expiration point (in miles), §1037.655(d)(1) states, "No person may disable a vehicle speed limiter prior to its expiration point." Note that §1037.640(a) states that designs with VSL soft tops, or expiration features are also subject to proration provisions. For VSL, the certifier must use the equation in 1037.640(d)(2) to calculate the prorated effective speed needed for GEM calculations, and for EOY reporting.

As an alternative to increasing the VSL, the vehicle owner could request that the vehicle manufacturer (certifier) provide the VSL with a soft-top feature.

- (b) To gain credit for an AES system, the manufacturer (i.e., the holder of the certificate) must ensure that the general adjustable parameter provisions also apply to AES operating parameters per §1037.660(d). This would assure that the manufacturer has applied tamper resistant methods to its vehicles which would preclude the second owner from changing the AES settings if the vehicle mileage is less than the expiration point.

For post-useful life vehicles, §1037.655(d) provides examples of prohibited modifications. One such example provides that no person may disable a VSL prior to the vehicle expiration mileage. Extrapolating this example, the agencies have determined that the same condition holds true for AES. The second owner cannot change or disable the AES settings if the vehicle mileage is less than the expiration point or if there is no expiration point. If the certifier is in doubt with respect to its own situation, it should consult with its EPA certification representative.

As a result, the second owner should take into account that the engine will continue to shutdown during extended idling, and as such this second owner may have to purchase an idle reduction technology to meet his/her heating and cooling needs.

Controlling vehicle speed inevitably involves specifications for max overshoot when entering the controlled state, as well as a max deviation within the steady state control band. What is the EPA's expectation for the max overshoot and max steady state control band they will allow given that both will allow for temporary, brief excursions above the GHG vehicle speed limit specified by the customer?

Each manufacturer should discuss the characteristics of its control system with its certification representative. This may include maximum momentary overshoot in vehicle speed, duration and steady-state accuracy. As noted in the heavy-duty final rule (76 FR 57156), NHTSA has previewed the possibility of a proposed safety rulemaking for VSLs in 2012 which may prescribe a lower speed tolerance and/or different overshoot parameters (76 FR 78).

Acceptable settings of AES system for temperature health and safety variables?

Based on the fact that many strategies can and will be deployed by manufacturers with regards to their AES and idle reduction strategies (i.e., hoteling operation, cab insulation, etc.), each manufacturer should discuss their strategy with their certification representative to give EPA assurance their strategy provides the expected idling reduction while maintaining a safe environment for the occupants.

What level of detail will EPA require for each aspect/topic that requires data? Specifically the technical details on VSL; on AES; and, on weight reduction parts and systems?

For all of these systems, you must keep records of these and other relevant certification data and calculations per EPA Reporting and Recordkeeping requirements provided in 40 CFR 1037.825 as well as NHTSA Reporting Requirements provided in 49 CFR 535.8(h). However, with regards to what needs to be submitted to EPA in the certification application, see the Commercial Tractor and Vocational Vehicle Certification Application template.

Refer also to 40CFR1037.660(d) adjustable parameters provisions that apply generally to AES with some exceptions as explained. Furthermore, for VSL, 1037.520(d) states, "Use good engineering judgment to ensure the limiter is tamper resistant. We may require you to obtain preliminary approval for your designs."

The certification application template will direct manufacturers to the level of specificity required (in terms of settings/expiration points/etc). To the extent manufacturers need to demonstrate tamper resistance or describe adjustable parameters, they will need to work with their certification representative. See the answer to previous questions regarding the level of detail required.

Are all parts used in weight reduction calculation considered Emission-Related parts?

§1037.120(c) states that, “Your emission-related warranty does not need to cover components whose failure would not increase a vehicle’s emissions of any regulated pollutant.”

§1037.655 specifies vehicle modifications that may occur after a vehicle reaches the end of its regulatory useful life. 1037.655(a) states, “General. Except as allowed in this section, it is prohibited for any person to remove or render inoperative any emission control device installed to comply with the requirements of this part 1037.”

Therefore, should a manufacturer determine that failure of a weight-reduced component can cause a vehicle’s emissions to increase; then:

- (a) Per §1037.120(c), the manufacturer must assure the weight-reduced component is replaced with a comparable weight-reduced component if it fails during the warranty period, and
- (b) Per §1037.655(a), it is prohibited for any person to remove or modify the weight-reduced component during or after its useful life.

Are all parts used in weight reduction calculation subject to defect reporting?

Should a manufacturer determine that failure of a weight-reduced component can cause a vehicle’s emissions to increase; then:

- (a) §1037.601(a)(2) states that manufacturers may comply with the defect reporting requirements of 40 CFR 1068.501 instead of the reporting requirements of 40 CFR part 85.
- (b) §1068.501(a) states that the certifying manufacturer must investigate whether engines/equipment introduced into U.S. commerce under its certificate have incorrect, improperly installed, or otherwise defective emission-related components or systems. This includes defects in design, materials and workmanship. The manufacturer must send EPA reports as specified by this section.

Can a manufacturer obtain credit for achieving weight reductions greater than the value listed in the table. For example, can a manufacturer come to us and show us that their specific aluminum wheel is more than 21 pounds (the value attributed to aluminum wheels in Table 3 of §1037.520) less than the steel wheel and then use their own weight reduction value instead of the one in the table?

No. If a component and material is listed in the table, then the manufacturers must use the value in the table. If they have weight reduction opportunities that are for components or materials not included in the table, then these may be considered under the innovative technology provisions, depending on the circumstances.

As stated in the preamble of this rule on 76FR57152 (Sept 15, 2011), “The agencies considered other materials such as plastic composites or magnesium substitutes but were not able to obtain weights for specific components made from these materials. We have therefore not included components made from these materials as possible substitutes in the primary program, but they may be considered through the innovative technology/off-cycle credits provision.”

If a component is eligible for aluminum and high strength steel weight, but if the component is also available in plastic (or some other material lighter than steel), can we come to the Agency with a procedure for weight reduction credits other than the one in §1037.520(e) (3) but also not the same as the innovative technology provisions, which are burdensome and unlikely to demonstrate any actual fuel savings to a statistically significant level (given test to test variability)?

The agencies did not have enough data to determine that a plastic hood would weigh a certain number of pounds less than a steel hood. Therefore, we could not add plastic components to Table 4 of §1037.520(e)(2). The innovative technology section §1037.610(b) states that, “The provision of this section may be applied as either an improvement factor or as a separate credit, consistent with good engineering judgment.” While this section also recommends that you base your credit/adjustment on A to B testing of a pair of vehicles, in a specific case where you feel good engineering judgment would be better characterized by some other test, you may send your request to your certification representative, including a detailed description of the technology and a recommended test plan per §1037.610(d). We recommend that you do not begin collecting test data for submission to EPA before contacting your certification representative.

Compliance and Enforcement:

What plans are there for compliance auditing by EPA and/or NHTSA on vehicle certifications and component inputs into the GEM?

- **E.g. Tire rolling resistance production variation and/or changes versus certified value?**
- **What are the liabilities for non-compliances and penalties, i.e. assessments from both EPA and NHTSA separately?**

The agencies may validate any component inputs, as necessary, through compliance testing. For tires, if the manufacturer chose to do correlation testing with either of the labs identified by the agencies in the previous question, we may check whether the tests CRR data show that, per §1037.520(c)(1), the manufacturer’s results were not biased low. EPA or NHTSA may perform a paperwork audit, checking for the existence of lab tire test reports. However, if one truck OEM reports CRR values for a tire model that are significantly different from the values for the same model submitted by other truck OEMs, then EPA may consider a test program to verify the CRR value for that particular tire.

Both agencies have compliance review and enforcement responsibilities for their respective regulatory requirements. See Section V.G. of the final rule (76 FR 57290) for a description of the penalty programs associated with non-compliance with each agency’s requirements.

With respect to penalties, as stated in the preamble (76 FR 57290, September 15, 2011), “The details of the consultation and coordination between the agencies regarding enforcement will be set forth in a memorandum of understanding to be developed by EPA and NHTSA. ... The collaborative enforcement process will ensure that the total penalties assessed will not be duplicative or excessive.”