UNITED STATES OF AMERICA
ENVIRONMENTAL PROTECTION AGENCY

Evaluation of Existing Regulations;	)	**Docket ID No.:**
Request for Comments	)	**EPA-HQ-OA-2017-0190**

COMMENTS OF THE TRUCK AND ENGINE MANUFACTURERS ASSOCIATION

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Jed R. Mandel
Timothy A. French
Truck and Engine Manufacturers Association
333 West Wacker Drive, Suite 810
Chicago, Illinois 60606

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Introduction

The Truck and Engine Manufacturers Association ("EMA") hereby submits its comments in response to the request that the U.S. Environmental Protection Agency published in the Federal Register on April 13, 2017, "seeking input on regulations that may be appropriate for repeal, replacement or modification." (82 FR 17793.)

EMA is the trade association that represents the world's leading manufacturers of internal combustion engines and heavy-duty on-highway commercial vehicles. The engines that EMA's members produce are used in virtually all applications, other than aircraft and passenger cars, and cover products that include on-highway trucks and buses, nonroad farm and construction equipment, marine vessels and locomotives, stationary generators and pumps, and lawn and garden equipment.

Over the past several decades, EPA has adopted myriad and increasingly stringent regulations establishing emission standards for each of the foregoing engine-product categories, and specifying how those engine products must demonstrate compliance with those various emission standards and related requirements. While EPA has regularly added to the number of regulations that govern the design and certification of emissions-compliant engine products, including regulations relating to the measurement and control of in-use emissions, EPA has rarely, if ever, eliminated any of the regulations (especially those that only add burden and cost, and no longer provide any cost-effective environmental benefit) that have accumulated in the Code of Federal Regulations over the past 30-plus years. Given that trend, EMA welcomes this opportunity to comment on the EPA regulations that are appropriate at this juncture for repeal, replacement or modification.

Set forth below are the regulations that EMA believes are ripe for repeal or modification. The first set of identified regulations include those that apply generally to all of the engine categories that are covered by EMA member-company products. The second set of identified regulations are applicable to specific engine and vehicle applications and are organized by product category. In assembling this list of regulations, and consistent with EPA's request, EMA has

attempted to focus on regulations that: (i) eliminate jobs or inhibit job creation; (ii) are outdated, unnecessary, or ineffective; (iii) impose costs that exceed benefits; or (iv) create inconsistencies with regulatory reform initiatives and policies. For the most part, the regulations that EMA has identified are those the costs of which have greatly outstripped their putative benefits. EMA looks forward to follow-up discussions with the Agency on the repeal or modification of each of the identified regulations.

Cross-Cutting Regulations

EPA has over the years adopted a number of engine-certification regulatory programs that apply to multiple categories of engine products. While certain of those regulatory programs may have had a reasonable basis for a claim of cost-effectiveness at the time of their initial adoption, which in some instances was more than thirty years ago, the more recent adoption of additional increasingly stringent regulations, coupled with the significant advancements in emission control technologies and diagnostics, have made several of those regulatory programs outdated and decidedly out-of-balance when assessed against any reasonable cost-benefit scale.

The cross-cutting programs at issue include production line testing, selective enforcement audit testing, the determination of deterioration factors, and the process for certifying "carry-over" engine families. EMA will address each of those programs in turn.

Production Line Testing

Under the various production line testing (PLT) regulations, EPA requires engine manufacturers, generally on a quarterly basis, and for each engine family, to select randomly a specified sample size of engines from the end of the manufacturers' assembly line. Engine manufacturers are required to test the randomly selected engines over the applicable certification test cycles to assess and confirm whether the engine family complies with the applicable emissions standards, based on the sampling of randomly selected engines. (*See*, *e.g.*, 40 C.F.R. §§ 1033.305, 1033.310, 1042.301, 1042.315, 1042.302, 1048.301, 1048.310, 1054.301, 1054.310, 1060.301 and 1060.310.)

The prescribed PLT testing is exceedingly expensive and time-consuming. Moreover, it is inherently duplicative and redundant since it amounts to little more than a costly repeat of the already rigorous initial engine testing required to obtain EPA's certification and approval to introduce engines into commerce. EPA should repeal the PLT regulations.

Selective Enforcement Audits

Under the various regulations relating to selective enforcement audits (SEAs), EPA may conduct, or may require an engine manufacturer to conduct, additional emission certification tests on specified production engines at a designated engine testing facility, which could be a facility other than the manufacturer's. This SEA testing is in addition to the PLT testing discussed above. (*See*, *e.g.*, 40 C.F.R. §§ 86.094-22, 1033.601, 1036.15, 1037.15, 1036.301, 1037.305, 1037.315, 1039.15, 1042.15, 1048.15, and 1054.15.)

As with PLT testing, SEA testing has become unreasonably costly and burdensome, especially since those SEA tests must be performed in Part 1065-compliant testing facilities. In addition, the rigorous engine family certification program, coupled with in-use testing requirements, often render SEAs an inherently duplicative and wasteful exercise. Accordingly, the SEA regulations should be modified to only allow the Agency to utilize SEAs as an enforcement tool when the Agency has a good faith basis to suspect a manufacturer's non-compliance. The Agency should be precluded from utilizing SEAs as a random enforcement mechanism or as a means to investigate a generic issue relating to engine technologies. EPA should amend and pare-back the SEA regulations accordingly.

Deterioration Factors

EPA has adopted multiple regulations over the years that relate to the calculation of deterioration factors or "DFs." The DF requirements force manufacturers to test the emissions from a sample of new engines, and then to run the engines continuously for many months to reach a point where, based on "good engineering judgement," the manufacturer can reasonably predict the engines' emissions performance at the end of their full "useful lives" (*i.e.*, 435,000 miles for HDOH engines). Typically, engine manufacturers use various techniques to age their engines to 35% of their full useful lives, and then test the aged engines' emissions to assess (based on an extrapolation out to 100% of the engines' useful lives) whether any emission constituents have increased (deteriorated) due to their operation over time. If so, manufacturers must ensure that their new engine emissions are sufficiently below the applicable emission standards to account for any observed DF. (*See*, *e.g.*, 40 C.F.R. §§ 86.004-26, 86.004-28, 1033.240(b), 1033.245, 1034.241(c), 1039.240(c), 1039.245, 1042.240 (c), 1042.245, 1048.240(c), 1048.245, and 1054.240(c).)

DF testing is exceedingly time-consuming and expensive, and its intended purpose is already served to a large extent by the advanced engine systems that can alert and induce engine operators to obtain any needed emission-related engine repairs. In light of that, EPA should initiate the necessary steps to substantially reduce the DF requirements as currently implemented by the Agency.

In particular, in its oversight of the DF-determination process, EPA should specifically allow for increased flexibilities and streamlining, including by allowing for the following: the expanded use of accelerated-aging bench tests; greater use of good engineering judgement to focus DF testing on specific regions of the engine-aging process (again, with the use of rapid-aging bench tests); greater use of good engineering judgement to address component part failures during testing; greater use of assigned DFs based on experience with similar technologies; expanded allowances for small volume exemptions from DF testing; and greater deference to manufacturers' engineering judgements regarding whether DFs are additive or multiplicative and whether the estimated deterioration is linear or not. Those increased flexibilities and opportunities for a more streamlined process are becoming increasingly important as DFs become a larger percentage component of the progressively lower emission standards. Similarly, the costs and burdens of DF testing are becoming increasingly disproportionate to their putative benefit as the underlying tailpipe standards continue their progression towards near-zero levels. Accordingly, EPA should implement the recommended revisions for simplifying and streamlining the DF requirements.

Carry-Over Engine Families

From one model year to another, manufacturers frequently produce engine families that do not incorporate any changes to their emissions-control systems or to their emissions profiles. For those types of engine families – referred to as "carry-over" engine families – engine manufacturers should not be required to go through the full EPA engine-certification process, since they will be inherently duplicative of the certification process for the prior engine model year. Rather, manufacturers should be allowed to notify and certify to EPA when a carry-over engine family is being manufactured, and EPA should issue a certification for that carry-over family based on the previously submitted certification application data relating to the prior model year engine family. In other words, for carry-over engine families, the annual certification renewal process should be largely automatic once a manufacturer attests to the Agency that a carry-over engine family is at issue. To that end, EPA should adopt guidance and regulations clarifying that carry-over engine families are exempt from the otherwise applicable annual engine-certification requirements, and that a more simplified attestation process will apply that will not require the resubmission of additional engine-test data.

Replacement Engine Provisions

Certificate holders use replacement engines to enable customers and operators to repair their equipment and trucks, and get back to their businesses, whether it be harvesting fields, constructing roads, or delivering goods. EPA's current replacement engine regulations are unduly burdensome, since they prevent certificate holders (*i.e.*, engine manufacturers) from quickly responding to the needs of customers and operators, while they also create significant recordkeeping and reporting challenges. The current replacement engine regulations are specified in 40 C.F.R. Part 1068.240, which limits where engines can be staged in the repair and maintenance process – specifically, not at facilities operated by a manufacturer's distributors and dealers – and delineates four different types of replacement engines that can be introduced into commerce. While originally written for nonroad engines, subsequent revisions have resulted in the same regulatory provision being applicable to heavy-duty on-highway engines as well. EPA's general regulatory principle is that the replacement engine must be at the same or at a lower emission level than the engine being replaced.

The regulation of replacement engines is important to ensure a level regulatory playing field for all marketplace participants. As currently prescribed, however, EPA's regulations are overly-burdensome due to onerous record-keeping and reporting requirements, in addition to a recently added provision that restricts the replacement of engines in equipment that is more than 40 years-old.

The four categories of replacement engines are as follows:

- Previous-tier replacement engines with tracking
- Previous-tier replacement engines without tracking
- Partially complete replacement engines
- Partially complete current-tier replacement engines

The first category requires annual reporting if any of the replacement engines are sold to distributors under the waiver described in 40 C.F.R. § 1068.240(b)(6). The second category requires annual reporting of not only the untracked engines produced, but of all other replacement engines regardless of the regulatory category. As a consequence, manufacturers are, in effect, required to submit annual reports to EPA for all replacement engines with information regarding which regulatory category applies.

The Agency should amend the replacement engine regulations to allow an engine manufacturer to stage replacement engines at dealers, distributors or other similar locations to better service customers and operators. As noted, those engines should be accounted for by the manufacturer in a simplified reporting process. Additionally, EPA should adopt a significantly simpler approach whereby all replacement engines would be considered as one category with one annual production report provided to EPA. In essence, the previous-tier replacement engines without tracking provisions would be applicable to all replacement engines (both complete and incomplete), but without volume limitations, and the reporting requirement for a given engine would be based on when that engine was introduced into commerce. In addition, the requirement that replacement engines be installed in equipment newer than 40 years-old would be removed. Under the recommended approach, where replacement engine reporting is required, there would not be any required tracking of replacement engines that are beyond an engine manufacturer's direct control, and reporting would be simplified to cover the engines that a manufacturer ships in a given calendar year.

Administrative Reporting Requirements

The administrative reporting requirements that are regularly included as components of EPA's emissions compliance programs are extremely burdensome and impose costs that far exceed their benefits. The frequency of submission for the required reports varies. Some are required on a quarterly basis, while others are required to be submitted within a certain number of days from a particular milestone. There are also reports that need to be submitted on a preliminary basis and then again later in the year as a final report. The high frequency of the submissions creates significant costs and paperwork, and adds no real-world emissions benefits. While it may be necessary for EPA to receive certain data to help assess whether manufacturers are in compliance with the Agency's numerous programs, receiving manufacturers' reports on more than an annual basis does not facilitate the data analysis or compliance reviews, which are the purported rationales for the reports. Accordingly, EMA recommends that EPA reduce the frequency of all periodic reports to one-time annual submissions, which will provide EPA with the necessary data on its various programs, while reducing the unnecessary burdens associated with duplicative and iterative reporting.

Technical Amendments

Over the years, and given the hundreds of EPA regulations that impact EMA's members' products, numerous technical issues arise that need to be accounted for through specific corrections or additions to the relevant regulatory text. Currently, there are many of those types of technical amendments that the Agency should consider and implement. EMA regularly provides feedback to EPA staff regarding the necessary technical changes to the Code of Federal Regulations, and

we will continue to do so. Given the technical and very specific nature of those issues, they are not spelled out in detail in the body of these comments, but are set forth separately in Appendix A.

There is, however, one over-arching issue relating to technical amendments that the Agency should address as a component of this regulatory review process. Typically, before codifying the technical amendments that accumulate over a given year (or period of years), the Agency will wait to include those amendments as an add-on to a separate substantive rulemaking effort. That approach can result in needed technical amendments remaining uncodified for years. To address that issue, EPA should commit to adopting a technical amendment regulatory package on an annual basis.

Engine Category-Specific Regulations

Heavy-Duty On-Highway Engines and Vehicles

On-Board Diagnostics

By far the costliest regulatory requirements facing manufacturers of heavy-duty on-highway (HDOH) engines are those that relate to the design and implementation of on-board diagnostic (OBD) systems. Under the operative EPA regulations, and to a larger extent under the OBD regulations that EPA has authorized the California Air Resources Board (CARB) to adopt and implement, HDOH engine manufacturers are required to equip their engines with exceedingly complex and costly software and emission-sensor systems to detect and provide alerts relating to the potential malfunction of hundreds of emissions-related engine components. The mandated OBD systems are covered by numerous pages of regulatory detail (*i.e.*, EPA's HD OBD regulation (40 C.F.R. § 86.010-18) is 67-pages in length, while CARB's HD OBD regulations are nearly 100-pages in length) and go far beyond the efficacy of common-sense functional diagnostics.

To put the OBD burden into perspective, HDOH engine manufacturers, on average, have spent approximately $75 million per manufacturer over the past 5 years to develop and implement the prescribed OBD requirements, and the projected annual average costs for the current OBD requirements (which now include in-use testing provisions) are more than $25 million per year per HDOH engine manufacturer. Those cost impacts are 10-20 times greater than the estimated costs that EPA relied on in adopting its (and authorizing CARB's) OBD regulations. Just as important, the ever-increasing OBD burdens are unsustainable. Engine manufacturers simply do not have sufficient test cell resources, among other capital and manpower constraints, to engineer and demonstrate compliance with the mushrooming OBD technical specifications and performance criteria. Nor do they have the resources to construct and maintain the additional new test cells that would be required to accommodate the steadily increasing burdens of the CARB/EPA HD OBD requirements. The net result is an inherently unreasonable HD OBD program.

EPA's HD OBD regulations are spelled out in 40 C.F.R. § 86.010-18. Those regulations include requirements for the verification and demonstration testing of the OBD systems of production vehicles, and multiple other onerous provisions. Even more significant, however, under section 86.010-18(a)(5), EPA has specified that the Agency will accept evidence that a manufacturer has complied with CARB's OBD requirements as a sufficient demonstration that the manufacturer has complied with EPA's OBD requirements. Over the years, as CARB's OBD

program has become more and more comprehensive and complex, EPA has, in effect, subordinated its OBD program to CARB's. That subordination has reached the point where EPA now requires engine manufacturers to submit to California's authority by obtaining a CARB Executive Order (showing approval of the manufacturer's OBD systems) as a prerequisite to obtaining EPA's certification of an HDOH engine family, and thus, as a prerequisite to being able to sell the covered engines in the rest of the country. EPA's wholesale delegation to CARB of the development and implementation of HD OBD requirements has led to the untenable results that pertain today.

CARB's authority to adopt and enforce HDOH OBD requirements stems in relevant part from EPA's grant of preemption waivers on September 8, 2008, December 10, 2012, and November 7, 2016. (*See*, 73 FR 52042, 77 FR 73459, and 81 FR 78149.) Those preemption waivers, however, were premised on OBD cost assumptions that have proved to be understated by a factor of 10-20 (*i.e.*, OBD costs amount to more than $1000 per individual HDOH engine, as opposed to CARB's original estimate of approximately $60 per engine), as noted above. That raises, among other things, significant concerns regarding the assumed cost-effectiveness of the current onerous OBD requirements.

In light of the foregoing, EPA should pare down its OBD regulations to focus on functional diagnostics for exhaust aftertreatment systems, and should work in earnest to ensure that CARB does the same. Real regulatory relief in this area is absolutely vital.

In-Use Testing Requirements

HDOH engine manufacturers are required to obtain and test a sampling of in-use vehicles equipped with HDOH engines to assess the engines' compliance with the applicable "not-to-exceed" emission standards. (*See*, 40 C.F.R. § 86.1901, et seq.) To implement the heavy-duty in-use testing (HDIUT) program, engine manufacturers use two sets of portable emissions measurement systems (PEMS), one to assess the engine's gaseous emissions, such as NO_X and NMHC, and one to assess PM emissions. The average cost per engine family for in-use PM and NMHC testing (not including the costs attributable to testing for NO_X or any other gaseous pollutants) is approximately $150,000. The average cost per HDOH engine/vehicle is approximately $30,000.

Since the implementation of the HDIUT program in 2006, experience has shown that the overall level of compliance with the in-use PM and NMHC NTE-based emission standards is extremely high, with almost no "failures" over a ten-year period. The flip side of that coin is that the continuing burden of in-use testing for PM and NMHC cannot be shown to be cost-effective, as there is no ongoing need for it. The only HDOH vehicles tested under the HDIUT program are those that are equipped with DPFs, and that have passed the screening process for in-use testing. Those engine/vehicles operate at emission levels well below the in-use standards. The utility of an in-use PM testing program for those vehicles is not sustainable. Likewise, the NMHC emissions from HDOH vehicles are inherently low and again well below the in-use standards. As a result, the costs of an in-use NMHC testing program are excessive and have little relationship to any potential benefits.

In-use testing for PM requires a separate PEMS, elaborate installation configuration and vehicle mountings, significant additional vehicle recruiting and set-up time, and significant additional de-installation and post-processing time. Testing for NMHC requires the use of FID gas bottles and other unique in-use testing issues (including PEMS failures) that create inordinate expenditures of time and money. Consequently, the in-use testing costs for those two pollutants add significant incremental costs, and no significant incremental benefits, to the HDIUT program.

The final rulemaking for the HDIUT program contained the following provision, which was specifically negotiated by EMA:

> Recognizing that experience may show that the effectiveness, durability and overall performance of new engine technologies and exhaust aftertreatment systems may demonstrate that in-use testing for certain pollutants is unnecessary, we will consider requests from engine manufacturers to discontinue reporting and/or measurement of one or more pollutants from some or all engines based on future test experience.
> (70 Fed. Reg. at 34610)

EPA should repeal the requirements of the HDIUT program as they pertain to PM and NMHC emissions.

GHG Phase 2 Regulations

EMA is supportive of the recently finalized GHG Phase 2 regulations. (*See*, 81 FR 73478-74274, Oct. 25, 2016.) EMA did not file a petition challenging those standards, nor did EMA support any Congressional review of the Phase 2 regulations. Notwithstanding EMA's general support, there are a number of regulatory revisions and technical amendments that EPA should implement to enhance the feasibility and efficacy of the GHG Phase 2 standards, as described in further detail below. In implementing the recommended improvements to the GHG Phase 2 program, EPA will need to coordinate with, and work to ensure parallel action by, the National Highway Transportation Safety Administration, which also oversees the implementation of its own fully-aligned fuel-efficiency regulations. EPA also will need to ensure that CARB adopts harmonized and fully-aligned regulations when it proceeds to adopt its own version of the Phase 2 regulations.

GHG Phase 2 Chassis Dynamometer Test Requirement

As an element of the recently adopted GHG Phase 2 regulations, EPA requires that HDOH vehicle manufacturers conduct chassis-dynamometer testing of five (5) tractors every year, beginning with the 2021 model year. (*See*, 40 C.F.R. § 1037.655.) Manufacturers are required to measure and report emissions of NO_X, PM, CO, NMHC, CO_2, CH_4, and N_2O. Along with reporting the dynamometer test results, manufacturers must also provide the corresponding greenhouse gas emissions model (GEM) results for the vehicles. In the preamble to the final GHG Phase 2 Rule, EPA acknowledged the inherent differences between chassis-dynamometer testing and GEM simulations, and stated that the Agency will not use the dynamometer data for compliance auditing purposes. Thus, the only rationale that EPA provided for the annual five-

tractor dynamometer test requirement is for the vague purposes of "data collection and informational purposes." (*See*, 81 Fed. Reg. 73,548.)

Testing Class 8 HDOH vehicles on a chassis-dynamometer is a time-consuming and resources-intensive undertaking. Many heavy-duty manufacturers do not have a chassis-dynamometer and therefore will have to pay an independent laboratory to conduct the testing for them. Moreover, there are substantial questions about the usefulness of the data, or even whether statistically valid conclusions can be drawn from year-over-year trends in the data. Vehicle changes that may show up in dynamometer test results may be unrelated to the vehicle aspects assessed in a GEM-based simulation, and therefore may be unrelated to the GHG Phase 2 Rule. Heavy-duty chassis-dynamometer testing also likely includes a significant amount of test-to-test and lab-to-lab variability that has not been analyzed and may eliminate the possibility of drawing any meaningful conclusions from the data. Furthermore, the onerous chassis-dynamometer test requirement includes measuring criteria pollutant emissions that are outside the scope of the GHG rule.

For the reasons stated above, EPA should eliminate the chassis-dynamometer testing requirement that is set forth at 40 C.F.R. § 1037.655.

Eliminate Unnecessary Coastdown Testing Requirements

Pursuant to 40 C.F.R. § 1037.525(b)(4), EPA requires that HDOH vehicle manufacturers perform new "coastdown tests" in 2021, 2024, and 2027, to determine new computational values for their alternative aerodynamic measurement methods. That mandate is inconsistent with the common-sense requirement contained in the very next sentence of the regulatory text, which states that a coastdown test "continues to be valid for later model years until you change the tractor model in a way that causes the test results to no longer represent production vehicles." (*See*, 40 C.F.R. § 1037.525(b)(4).) The mandate that manufacturers conduct new coastdown testing at each regulatory step would require additional testing even in the absence of any change to vehicle design that would affect the aerodynamic results. It is an unnecessary and extremely costly regulatory test burden that is at odds with its companion regulatory provisions.

EPA should eliminate the regulatory mandate (40 C.F.R. § 1037.525(b)(4)) to conduct coastdown tests at every regulatory stringency step, and instead should only require new coastdown tests when design changes are made that affect aerodynamic performance.

Encourage Early Adoption of GHG-Reducing Technologies

Under the current GHG regulations, EPA provides for the enhanced generation of emission credits when certain GHG Phase 2 technologies are deployed during the "Phase 1" time-frame. *See*, 40 C.F.R. § 1037.150(y)(2). Specially, the regulations allow manufacturers to generate credits for the early deployment of automatic tire inflation systems on tractors, automatic engine shutdown systems, stop-start systems, and neutral-idle systems. EPA should expand those provisions to include additional Phase 2 technologies, such as automatic tire inflation systems on vocational vehicles, predictive cruise control, and extended-idle shutdown systems.

Similarly, the GHG Phase 2 Rule provides for the generation of extended-life emission credits for the early deployment of Phase 2-compliant light and medium heavy-duty vocational vehicles during the Phase 1 time-frame. *See*, 40 C.F.R. § 1037.150(y)(1). EPA should expand that provision to provide extended-life credits for the early deployment of Phase 2 heavy heavy-duty vocational vehicles as well.

To encourage the early deployment of Phase 2 engine technologies, the regulations provide an alternative compliance schedule for medium and heavy heavy-duty tractor engines that meet the Phase 2 standards one-year early. *See*, 40 C.F.R. § 1036.150(p). That provision also obligates manufacturers to meet the vocational engine standards one-year early, but does not likewise provide for any alternative CO_2 standards for those vocational engines in subsequent years. EPA should provide a similar compliance path that incentivizes the early deployment of Phase 2 light, medium and heavy heavy-duty vocational engines.

In the GHG Phase 2 preamble discussion about revising the "baseline" vocational engine emission level (from which EPA derived the Phase 2 engine-emission reductions), the Agency stated that it would not allow "engine credits generated against the Phase 1 [vocational vehicle engine] standards to be carried over into the Phase 2 program." *See*, 81 Fed. Reg. 73,569 (October 25, 2016). However, the Final Rule failed to include any replacement mechanism to provide incentives for vocational engines produced during the Phase 1 time period that out-perform EPA's new medium and heavy-duty Phase 2 vocational baselines. To create such an early-deployment incentive, and as an alternative to credit-calculation on the basis of the tractor engine standards, EPA should allow manufacturers to carry-over credits generated by vocational engines during Phase 1 to the extent that they out-perform EPA's Phase 2 baselines for light, medium and heavy heavy-duty vocational engines.

Avoid Unintended Consequences of Stop-Start Technologies

The Phase 2 Rule assumes the use of a technology to automatically shut-down the engine no more than five seconds after a medium and heavy heavy-duty vocational vehicle comes to a complete stop. While stop-start technologies have been deployed on passenger cars for years, it is completely new to commercial vehicles. The Rule provides for certain override conditions that are utilized on passenger cars to avoid creating the unintended consequences that can occur when an engine is shut-down automatically, such as providing for overrides when the vehicle cab temperatures are too low for the driver's safety or when the main battery's state-of-charge is too low to restart the engine. *See*, 40 C.F.R. § 1037.660(b)(4). As EMA requested during the rule-making process, we request that EPA work with manufacturers to identify additional override conditions necessary to ensure safe and effective vehicle operation that are not specified in the final regulations to reduce the occurrence of unintended consequences from the use of stop-start technologies on medium and heavy heavy-duty vocational vehicles.

Align the Audit Procedures for Aerodynamic Performance

EPA has recognized that there are multiple methods for measuring the aerodynamic drag of a heavy-duty vehicle, and that "no single test procedure is superior in all aspects to other approaches." *See*, 81 Fed. Reg. 73,625 (October 25, 2016). Accordingly, in 40 C.F.R. § 1037.525, the GHG Phase 2 Rule allows for measuring aerodynamic drag using any of several different

procedures. However, in the selective enforcement audit procedures for aerodynamic testing, regulations specify the use of only the coastdown method for measuring aerodynamic drag, yet they also provide that EPA may require a manufacturer to use the same method it used for certification. To reduce audit complexity and increase compliance predictability, EPA should revise the regulations to clarify that a manufacturer will only be required to conduct a selective enforcement audit test of aerodynamic performance using the same measurement method the manufacturer used for certification.

Refine Greenhouse Gas Emission Model (GEM) Simulations

The GEM simulation used in the Phase 2 Rule includes a model of a hydrodynamic torque converter used in automatic transmissions. The torque converter model uses various calculations to simulate how an actual hydrodynamic torque converter would slip at slow speeds and lockup at high speeds. EPA's Regulatory Impact Analysis (RIA) for the Phase 2 Rule acknowledges that the GEM simulation only approximates the K-factor torque curve that defines how an actual torque converter functions, but predicts that "for the vast majority of vehicles, the effect of this approximation on simulated CO_2 emissions is negligible. *See*, RIA § 4.2.2.3.3.4. However, EMA has found that when simulating certain engines in GEM, they consume significantly more fuel during low-speed operation than in the real world. EPA should reassess the K-factor used in the automatic transmission torque converter model in GEM to ensure that it is representative of actual torque converters, or provide a method for determining K-factors for different transmissions and inputting the values in GEM.

Promote Deployment of Hybrid Technologies

The GHG Phase 2 Rule requires that manufacturers conduct a powertrain test to assess the benefits of mild hybrid technologies. However, powertrain testing is very complicated, time consuming and expensive. To promote the deployment of mild hybrids without mandating the burden of powertrain testing, EPA should provide a fixed benefit for mild hybrids that could be added to GEM in lieu of actual powertrain test results.

The Phase 2 Rule provides an advanced credit multiplier for plug-in electric hybrid vehicles to promote their deployment. Similarly, EPA should also provide an appropriate advanced credit multiplier for the deployment of hybrid powertrains that do not have the plug-in feature.

Reduce Certification Burdens

The GHG Phase 2 Rule is primarily structured as a credit-averaging regulation whereby manufacturers assess vehicles in the GEM simulation and ensure that at the end of the year all the vehicles they have sold, on average, meet the mandated emission standards. Under such a scheme, much of the initial information manufacturers provide EPA to obtain certification is merely a prediction of where the manufacturer's credit balances will be at the end of the year. Accordingly, we recommend streamlining the up-front certification requirements as follows:

- Eliminate the need to submit GEM results for prospective vehicles
- Eliminate credit projections

- Allow carry-over certification after the first year of a new GHG standard

The GHG Phase 2 Rule includes detailed and complicated Delegated Assembly requirements for auxiliary power units (APUs) and for natural gas fuel tanks that are often installed by specialized manufacturers after the vehicle leaves the truck-manufacturing plant. Such multi-stage manufacturing occurs because the APU and natural gas tank installers are experts in their trades and receive minimal input from the truck manufacturer. Accordingly, EPA should streamline the requirements so that the truck manufacturer simply validates that the components were actually installed.

Class 2b/3 Testing Burden

Testing 10% of the sub-configurations of Class 2 and 3 cab-complete vehicles will create disproportionate and extreme amounts of testing compared to other vehicle categories. While there are high volumes of Class 2 and 3 sub-configurations compared to light-duty vehicles, the actual sales volumes for Class 2 and 3 vehicles are generally very low. This leads to a disproportionately high test burden for a relatively small fraction of manufacturers' vehicle sales. The testing requirements for Class 2 and 3 vehicles should be proportionate to their total volume. Accordingly, EPA should modify the testing requirement in the regulations to cover either a smaller percentage, or the Agency should set a cap at 20 tests. (*See*, 40 C.F.R. § 86.1819-14(d)(9)(i).)

Air Conditioning (AC) Credits

EPA and NHTSA recognize AC improvements in the regulations for light-duty vehicles, but not for heavy-duty vehicles, even though EPA and NHTSA both recognize the benefits of AC technologies that reduce GHGs and fuel-consumption. Since the benefits of those technologies are not measured in the certification process, they are applied as credits. Although the benefits are just as real for heavy-duty vehicles as they are for light-duty vehicles, neither EPA nor NHTSA allows credits for AC technologies. Manufacturers believe those credits should be harmonized between the light-duty and heavy-duty programs. To that end, EPA (and NHTSA) should modify (harmonize) the heavy-duty vehicle regulations to include AC credits, using a list of pre-approved default credits. (*See*, 40 C.F.R. § 86.1867-12 – CO_2 credits for reducing leakage of air conditioning refrigerant; 40 C.F.R. § 86.1868-12 – CO_2 credits for improving the efficiency of air conditioning systems; and 40 C.F.R. § 600.510-12 – calculation of average fuel economy and average CREE.)

Off-Cycle Credits

Similarly, EPA recognizes off-cycle improvements in the regulations for light-duty vehicles, but not for heavy-duty vehicles. As with the AC credits described above, EPA and NHTSA recognize the benefits of off-cycle technologies, yet do not offer credits for heavy-duty vehicles. (Off-cycle means that the benefits are not fully measured in the certification test cycle.) Manufacturers believe those credits should be harmonized between the light-duty and heavy-duty programs. Accordingly, EPA (and NHTSA) also should modify (harmonize) the heavy-duty vehicle regulations to include credits for CO_2-reducing off-cycle technologies, using a list of pre-approved default credits. (*See*, 40 C.F.R. § 86.1869-12 – CO_2 credits for off-cycle CO2-reducing technologies; and 40 C.F.R. § 600.510-12 – calculation of average fuel economy and average CREE.)

Drive-By Noise Requirements

EPA's drive-by noise requirements are found at 40 C.F.R. Part 205, Subpart B. Those requirements are outdated and EPA has not attempted to enforce them for many years. In fact, the enforcement office associated with those regulations was disbanded in the 1980s. In light of the foregoing, EPA should eliminate those regulations.

Nonroad Engines

Global Harmonization

The machinery and equipment that are powered by nonroad engines are sold into a global marketplace. As a result, it is critically important to engine manufacturers' ability to compete effectively in the global market for nonroad engines that the applicable engine-certification regulations be as fully aligned and harmonized as possible. To that end, EPA should work proactively to ensure that its nonroad engine regulations do not create any unwarranted barriers to international trade and commerce.

Specific Recommendations

- EPA should eliminate the NTE requirements for nonroad engines that are less than 19kW and that do not have electronic controls. (*See*, 40 C.F.R. § 1039.101(e).) Under the European Union's (EU) Stage V regulations, mechanically-controlled nonroad engines do not need to comply with the NTE requirements.

- EPA should eliminate the requirement that nonroad engines less than 19kW be tested over the nonroad transient test cycle (NRTC). The EU Stage V regulations exclude all variable-speed nonroad engines less than 19kW from the NRTC-testing requirements.

- EPA should eliminate the requirement that nonroad engine manufacturers measure and report GHG emissions. Specifically, EPA should eliminate the requirements that nonroad engine tests include the measurement of CH_4 and N_2O emissions. The required investments in measurement systems, testing processes, and dedicated personnel are widely disproportionate to any putative benefits.

- EPA should eliminate the requirement that nonroad engines used in auxiliary power units (APUs) be equipped with diesel particulate filters (DPFs). That requirement (*See*, 40 C.F.R. § 1039.699) is not cost-effective.

- Certain regulations restrict cost-effective emissions solutions from being deployed in specialized, low-volume agricultural and construction equipment, and so have potentially negative emissions impacts. In that regard, EPA should eliminate the percentage limit on the annual production of "Alternate FEL Cap" engines, which is currently set at 5%. (*See*, 40 C.F.R. § 1039.101(d)(2).) Using Alternate FEL Caps allows for a more cost-effective emissions solution for low-volume specialty products when a fully-compliant Tier 4 solution can be cost-prohibitive. Removing this volume limit would allow full market demands to be met, without any net emissions impact, since credits are required to offset

the higher-emissions products. Additionally, the provisions which allow exemptions from transient testing, not-to-exceed requirements, and crankcase emissions for the first four years of the Tier 4 standards should be re-instated. Those exemptions provide another means for allowing the development of cost-effective engines for low-volume specialty products, while maintaining a neutral emissions impact by adjusting the required credits upward based upon appropriate correction factors. Accordingly, the previously-used correction factors should be re-established without expiration. Those two changes would ensure cost-effective options for low-volume specialized equipment that powers America's agricultural and construction industries without negative emissions impacts.

- EPA should eliminate the smoke testing requirements for nonroad engines. (*See*, 40 C.F.R. § 1039.105.)

Marine and Locomotive Engines

Alignment with IMO Standards

EPA's Tier 4 marine engine standards are aligned with the IMO Tier III limits for engines with power ratings greater than 600kW, but not for engines with power ratings between 130-600kW. One result of this mis-alignment is that advanced NO_X-control technologies have been developed and implemented for certain commercial marine engines above the 600kW power threshold, but not below. That result, in turn, means that there is a potential shortage or unavailability of IMO Tier-III-compliant engines below 600kW. That situation has arisen in Canada and has required that annual exemptions be implemented for the IMO Tier III standards as applied to commercial marine engines rated between 130-750kW on vessels with combined propulsion power less than 750kW.

Additionally, commercial marine vessels built in 2016 are in service now with EPA Tier 3-compliant engines ranging from 130kW-1400kW that do not incorporate aftertreatment systems. Those engines are IMO Tier II- compliant. Vessel builders and owners need guidance from EPA confirming that they may continue to operate their EPA Tier 3-compliant engines under the scenarios described below.

Given the regulatory mis-alignment and potential product unavailability at issue, EPA should issue a regulatory guidance document confirming that the following reasonably anticipated scenarios will be permitted for U.S. domestic vessels equipped with EPA Tier 3 engines, and for U.S.-flagged or foreign-flagged international vessels equipped with EPA Tier 3/IMO Tier II engines and IMO Tier II engines, respectively.

Scenario 1

Guidance should allow unimpeded travel between all U.S. port cities for EPA Tier 3 engine-equipped vessels that are only engaged in domestic U.S. commerce.

Scenario 2

> Guidance should provide a process for allowing exemptions on a case-by-case basis, based on IMO Tier III product unavailability for engines less than 1400kW, during vessel planning or construction phases. Those exemptions could be granted by the U.S. or any other flag-state. In such cases, EPA Tier 3/IMO Tier II engines would be acceptable. Such vessels would be allowed to enter and operate in U.S. waters as compliant vessels without triggering any IMO Tier III requirements for the exempted engines. It is anticipated that IMO Tier III-compliant engines will become available within the next 12-24 months to fill product gaps below 1400kW.

Scenario 3

> Guidance should allow U.S.-domestic vessels to travel to Canada with EPA-certified engines, as Canada currently allows, and to return to U.S. ports as domestic vessels.

In assessing the scope of the necessary guidance, it is important to note that the foregoing scenarios could apply not just to vessels with propulsion engines less than 600kW, but also on larger vessels having propulsion engines greater than 600kW, which also are equipped with auxiliary marine engines less than 600kW. In such cases, the EPA Tier-3-compliant auxiliary engine would not be compliant with IMO Tier III due to product unavailability.

Additionally, the IMO regulations have an exemption from emissions requirements for marine emergency-power gensets. EPA's current marine regulations, however, do not contain such an exemption. Most emergency gensets installed on vessels are radiator-cooled, and so are different from the types of sea water-cooled engines on which the current marine engine standards are premised. While there is an exemption under the marine regulations for the use of engines certified to the land-based standards, those engines typically lack the other marine hardware (SOLAS, USCG hoses, etc.) required in order to be installed on a vessel. Accordingly, EMA recommends that the marine regulations be harmonized with the IMO regulations, which contain an exemption for marine emergency-power gensets.

Useful Life Determination

The "useful life" regulations applicable to marine engines are inconsistent with the useful life regulations that apply to nonroad engines. (*Compare* 40 C.F.R. § 1042.101(e)(2) *with* 40 C.F.R. § 1039.101(g)(2).) More specifically, under the marine engine regulations, it is possible that an engine family's useful life could be extended if a manufacturer advertises or markets a longer time to rebuild, even if the manufacturer is not seeking EPA approval of an alternative useful life different from the generally specified useful life values. EPA should revise section 1042.101(e)(2) to conform to the language utilized in section 1039.101(g)(2).

California Requirements For Engines Below 37kW

EPA has previously granted a preemption waiver authorizing CARB to adopt certain emission standards for certain categories of marine engines. Over time, this has created an unacceptable inconsistency in marine engine standards, since, in at least once significant instance, CARB has not kept pace with EPA.

Currently, CARB's regulations require that marine engines less than 37kW need to be certified to EPA's Tier 2 emission standards. (*See*, 13 CCR § 2421(b)(1)(A). Table 1a.) However, EPA's current standards for marine engines less than 37kW are the Tier 3 emission standards, not the Tier 2 standards. Thus, in this instance, CARB's regulations are less stringent than the corollary federal standards and, as such, are not entitled to a preemption waiver.

California's emission standards for marine engines less than 37kW no longer meet the requirement for a preemption waiver under Section 209(e) of the federal Clean Air Act (42 U.S.C. § 7543(e)), and, thus, California's waiver for those standards should be withdrawn.

Recreational Marine Engines

EPA should allow high-performance Category 1/Tier 3 diesel-fueled recreational marine engines below 600kW to be used in commercial vessels, with certification testing allowed under the E5 test cycle and with a specified useful life of 1000 hours. Currently, those engines are tested under the E3 test cycle and are required to meet a longer useful life. (*See*, 40 C.F.R. § 1042.101.) Nonetheless, the type of high-performance diesel-fueled marine engines at issue have an inherently more limited service life given their high power rating and power-density, and in that regard, are more similar to gasoline-fueled inboard and outboard engines.

Gasoline-fueled marine engines may be installed in commercial vessels based on the certification as recreational marine engines under the E4 test cycle, and with a limited useful life requirement. Similar treatment and accommodation should be afforded to high-performance diesel-fueled recreational marine engines. This regulatory amendment will simplify the treatment of recreational marine engines and will level the regulatory playing field.

DFs For Marine Engines

As noted previously, the current DF requirements should be eliminated or substantially streamlined. In the specific case of marine engines, EPA should allow engine manufacturers to utilize fixed multiplicative DFs based on the application of good engineering judgement in the context of known engine technologies. EMA proposes the following multiplicative DFs for the following pollutants: CO 1.1, HC 1.1, NO_x 1.05, and PM 1.05.

Production Line Testing

As noted earlier, PLT requirements are outdated and should be eliminated. This requirement is especially burdensome and costly as applied to marine engines, and is a requirement that EPA has not imposed on the manufacturers of nonroad engines. In particular, special consideration should be given to Category 2 marine engines. Category 2 marine engine families currently are not allowed the low-volume family exemption that is provided for Category 1 marine

engines under 40 C.F.R. §1042.301(a)(2). As such, if even a single engine is sold in a Category 2 family during a model year, it must have a PLT test. With Tier 4 standards forcing the use of aftertreatment, and with the advent of 40 C.F.R. 1065 test methods, the cost of PLT testing on such large engines and aftertreatment systems has become exorbitant, and the testing process has become exceedingly burdensome. PLT testing is so expensive, in fact, that it can limit the number of low-emission Category 2 engines that can be placed on the market. In that regard, there are very few test cells in the world that can accommodate such large engines with aftertreatment, and setting up and running a PLT test consumes a wholly disproportionate amount of the time available in those few test cells. That it turn limits manufacturers' ability to develop new products. Accordingly, PLT requirements should be eliminated across the board, and especially with respect to Category 2 marine engines. At a bare minimum, Category 2 marine engines should be allowed to use the low-volume family exemption in 40 C.F.R. §1042.301(a)(2).

Also, if all marine PLT's are not eliminated, quarterly reporting of PLT results should be eliminated. (*See*, 40 C.F.R. § 1042.345.) That reporting requirement puts an extra burden on marine engine manufacturers, and, again, is a burden that is not placed on nonroad engine manufacturers.

Stationary Engines

"Grand-Fathered" Emergency Backup Engines

On May 1, 2015, in the case of Delaware Dept. of Natural Resources v. EPA, Case No. 13-1093 (D.C. Cir. 2015), the Court of Appeals struck down the 100-hour exemption from air pollution controls that EPA had allowed for emergency backup generators, including during emergency demand-response operations. *See*, 40 C.F.R. § 60.4211(f). To address the uncertainties caused by the Court of Appeals decision, EPA should adopt "grand-fathering" provisions for engines that were manufactured to function as emergency backup engines during the period from January 1, 2011, through May 1, 2015. More specifically, EPA should clarify that the grand-fathered engines may operate for an unlimited number of hours in emergency situations, and may operate for up to 100 hours for non-emergency demand-response purposes if they are retrofitted with selective catalytic reduction systems that can demonstrate Tier 4 emission levels through established on-site emissions testing procedure at typical engine-operating loads.

Small Spark-Ignited Engines

Small spark-ignited (SSI) engines are used to power a broad array of products, ranging from lawn mowers to portable generators. Over the years, EPA has adopted an increasingly comprehensive and stringent regulatory program to control and reduce the emissions from SSI engines. Certain of those regulations, however, have proved to be overly burdensome and unduly costly, including the following:

- EPA should adopt a clear and straight-forward small-volume engine family threshold definition for SSI engines.

Conclusion

EMA appreciates the opportunity to submit these comments on the regulations that the Agency should consider for repeal, replacement or modification. We look forward to discussing these issues in further detail with the Agency in the near future.

Respectfully submitted,

TRUCK & ENGINE
MANUFACTURERS ASSOCIATION

Appendix A

Necessary Technical Amendments

As noted in the body of EMA's comments, the implementation of EPA regulations regularly identifies technical issues that were not foreseen or adequately addressed when those regulations were initially drafted and adopted. EMA and EPA staff typically sort through those technical issues in a collaborative manner, but there is no established procedure for implementing agreed-upon technical amendments in a timely manner. EPA should adopt a policy whereby a package of technical amendments is proposed for adoption on an annual basis. In that regard, the following items, among others, should be included in the next round of technical amendments that the Agency undertakes:

- Eliminate the limitation on the use of replacement engines in stationary equipment that is more than 15 years-old, as specified in 40 C.F.R. § 60.4210(i).

- Establish separate NESHAP limits for liquid-fueled compression-ignition stationary engines with displacements larger than 30 liters per cylinder, especially for engines operating on fuels other than ultra-low sulfur diesel fuel.

- Simplify and enhance the flexibility of the engine labeling regulations, including those that pertain to the content and location of engine labels.

- Allow more flexibility in the Agency's DEF quality guidance to permit more widespread use of NO_x-sensor-based DEF quality monitoring.

- Revise the marine replacement engine notification requirements from the current 30-day deadline (from the date of shipment) to match the nonroad replacement engine notification deadline of 270 days after the end of the relevant calendar year.

- Streamline the EIAPP application and certification process.

- Align and harmonize the EPA and IMO certification test fuel requirements for Category 1 and 2 marine engines. Currently, EPA requires the ASTM fuel specifications, while IMO requires fuels meting the specifications of ISO 8217.

- Eliminate the requirement under 40 C.F.R. § 1042.820 for NO_x and PM reductions relative to a baseline engine to determine authorization for a certified remanufactured engine, and instead use the standards of the respective Tiers as the basis for cost-effectiveness calculations under 40 C.F.R. § 1042.815.

- Allow for the use of natural gas kits for remanufacturing engines, even though the fuel does not need to be registered. *See,* 40 C.F.R. § 1042.801(f)(1).

- Change the altitude specified in 40 C.F.R. § 1033.115 (e)(1) from 7000 feet to 4000 feet to correspond with 40 C.F.R. § 1033.505.

- Remove the following language from Maintenance Instruction (See, 40 C.F.R. § 1033.220): "If owners/operators follow the original maintenance instructions rather than the newly specified maintenance, this does not allow you to disqualify those locomotives from in-use testing or deny a warranty claim." To help ensure in-use compliance, the updated Maintenance Instructions need to be controlling. To that end, EPA should allow manufacturers to require that the most current maintenance instructions be followed prior to in-use testing.

- Revise 40 C.F.R. § 1033.645 so that engine manufacturers will not be subject to in-use liability for engines that have been identified to contain non-OEM parts, and such engines will be excluded from in-use testing.

- Eliminate the prohibition against deeming Category 1 and 2 IMO Stage II-III engines to be interchangeable with EPA Tier 4-certified marine engines for use on U.S.-flagged vessels.

- Reduce or eliminate stationary performance test requirements for stationary engine operators if the engines are EPA-certified (*e.g.*, NSPS-certified engines).

- Reduce the administrative burdens associated with Delegated Final Assembly, including through the elimination of the requirement to submit annual affidavits.

- Under EPA 40 C.F.R. § 1068, allow engines to be moved from one exemption to another (*e.g.*, from test exemption to manufacturer-owned).

- Align marine and locomotive annual PLT reporting requirements to eliminate reports if no testing took place. *See,* 40 C.F.R. §1033.320(e), and §1042.345(a).

- Change Inducement-Override reporting (40 C.F.R. § 60.4201(g)) to events where a 120-hour reset is requested from the manufacturer. Eliminate reporting of each and every activation.

- Eliminate the requirement to add a DPF to an engine in remote regions of Alaska, as required by 40 C.F.R. § 60.4216 if a marine engine is used pursuant to § 60.4201(g).

- 40 C.F.R. § 10033.250 and § 1033.335 – Combine locomotive quarterly sales report and locomotive quarterly installation audit report into one annual report.

- 40 C.F.R. § 1033.135 – Reduce the required label information to a minimum to match the information on EPA-issued certificates. Eliminate other details.

- 40 C.F.R. § 1068.210 – Formal requests for test exemption approval should be web-based and the approval process should be streamlined for expedited approval.