Comments of the

Motor & Equipment Manufacturers Association

to the

Environmental Protection Agency

Re: Request for Comment on Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards

Docket No. EPA–HQ–OAR–2019–0055; 5 FRL–7165–03–OAR

May 16, 2022

Introduction

The Motor & Equipment Manufacturers Association (MEMA) submits these comments to the Environmental Protection Agency (EPA) pursuant to the agency's request for comment on the proposed plans for the U.S. Heavy Duty (HD) oxides of nitrogen (NOx) emissions regulations Notice of Proposed Rulemaking (NPRM).[1]

MEMA is the leading trade national trade association representing motor vehicle parts manufacturers, which is the largest sector of manufacturing jobs in the United States.[2] Vehicle suppliers develop innovative technologies and manufacture original equipment (OE) and aftermarket components and systems for use in passenger cars and commercial trucks.

MEMA represents more than 1,000 companies that manufacture new original equipment (OE) and aftermarket components, systems, and materials for use in passenger cars and heavy trucks. MEMA represents its member companies via the Automotive Aftermarket Suppliers Association (AASA); the Heavy Duty Manufacturers Association (HDMA); MERA – The Association for Sustainable Manufacturing; and the Original Equipment Suppliers Association (OESA). The motor vehicle components manufacturing industry is the nation's largest sector of manufacturing jobs – employing over 907,000 workers in all 50 states – with a total employment impact of 4.8 million jobs.

The HDMA member companies make up about 60 percent of the U.S. market for heavy-duty (HD) commercial vehicle components. The HD suppliers provide original equipment parts, systems and materials used to manufacture new commercial vehicles and related equipment as well as aftermarket replacement parts needed to repair and maintain in-service vehicles. The MERA member network of remanufacturers and their suppliers operates primarily in the automotive and commercial vehicle sectors and promotes the environmental, economic and product performance benefits of remanufactured goods. A 2012 International Trade Commission (ITC) report found that

[1] 87 Fed Reg 17414

[2] Vehicle suppliers directly employ 907,000 people and operate in all 50 states. Direct, indirect, and induced vehicle supplier employment accounts for over 4.8 million U.S. jobs and contributes 2.5 percent to U.S. GDP. Source: U.S. Labor and Economic Impact of Vehicle Supplier Industry, MEMA and IHS Markit. February 2021.

remanufacturing supports at least 180,000 full time jobs in the U.S. Further, the ITC report states that production of remanufactured goods in the U.S. increased by 15 percent from 2009 to 2011 and exports totaled $11.2 billion annually.[3]

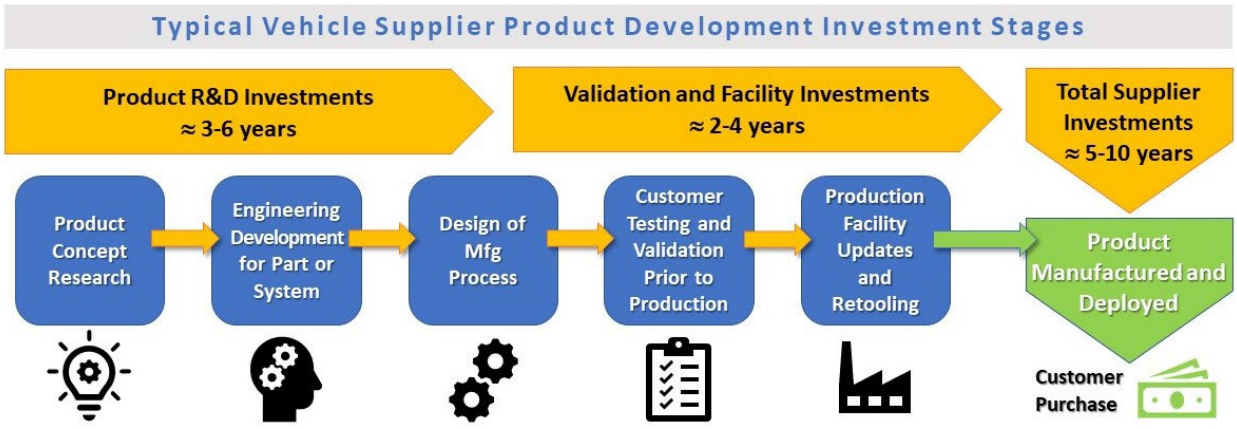
Suppliers' Role in Developing Innovative Technologies

Motor vehicle suppliers develop and produce a multitude of technologies and wide range of products including complex, highly integrated vehicle systems to make vehicles more efficient and lower emissions. Suppliers are committed to providing affordable technologies needed to increase fuel efficiency and continue to reduce vehicle emissions – including greenhouse gases (GHG), NOx, and particulate matter (PM). A typical HD vehicle contains more than 30,000 components and subsystems, the majority of which are developed through supplier innovation.

In many cases suppliers lead the industry's technology development. Suppliers anticipate the needs of vehicle manufacturers and work independently creating and investing in multiple technology solutions to assist their customers in meeting the next set of emissions standards. Suppliers then work collaboratively with vehicle and engine manufacturers. In the case of HD NOx, many suppliers have invested significant resources in research and development (R&D) in various technologies to help their customers comply with future lower NOx standards while also helping to improve efficiency.

Given the leading role taken in technology development, suppliers assume the associated risks by developing technology advancements needed to comply with standards for future lower HD NOx emissions and other emissions. Development of these technologies requires substantial lead-time, major economic resources, and product planning that includes several stages. Importantly, suppliers do not get return on their capital investment until these technologies are deployed (see graphic below). The return on investment is estimated very carefully and amortized over several years. Therefore, more stringent HD NOx emissions standards and a comprehensive HD rulemaking have enormous implications on the motor vehicle supplier industry. The regulatory process provides the industry the needed certainty to develop and improve future products and systems.

Motor Vehicle Parts Suppliers Product Planning and Investments Timeframe



[3] "Remanufactured Goods: An Overview of the U.S. and Global Industries, Markets, and Trade" Report, U.S. International Trade Commission (ITC), Investigation No. 332-525, USITC Publication 4356, Oct. 2012.

Stringency of HD NOx Standards is Critical for U.S. Leadership in Global Innovation

EPA's last update of the HD NOx standards was nearly 20 years ago. EPA's proposed rulemaking presents a unique opportunity for further reductions in HD NOx emissions standards and sets a signal for best-in-class emission control technologies that will ultimately preserve U.S. competitiveness globally. The U.S. has a strong history of being a global leader in HD emissions technology innovation and is uniquely positioned to continue to lead the world in HD advanced fuel efficiency and emissions-reducing technologies. A comprehensive federal HD NOx rulemaking will advance U.S. innovation in these technologies. Maintaining stringency in the HD NOx standards will improve the environment and support a strong motor vehicle supplier manufacturing sector, which is the largest sector of manufacturing jobs in the U.S. and is critical for the U.S. to secure its position as the global technology leader.

MEMA supports new HD NOx emissions standards and additional test cycles that will drive additional NOx emissions reductions on the road and encourages best-in-class technologies. These standards should be performance-based and technology-neutral and the test-cycles should reflect real use of vehicles. Both the standards and test cycles should enable multiple technology paths to achieve compliance.

Summary of MEMA Comments

MEMA's comments on the EPA HD NOx NPRM will discuss the following:

- **MEMA Supports Option 1 with Modifications to Warranty Time Period/ Mileage, Covered Warranty Parts, and Full Useful Life**

  MEMA supports a NOx rule that relies on certification cycles and in-use tests that better represent real-world use and will encourage best-in-class technology adoption while effectively meeting lower NOx emissions requirements.

  EPA's proposed Option 1 should be modified to include a significant reduction of the proposed the warranty time periods and mileage requirements, a special consideration for vocational vehicles, and an exclusion of normal maintenance and wear parts from the warranty. Each of these modifications is described in further detail below.

  These modifications are necessary because Option 1 significantly increases the Warranty period and Full Useful Life (FUL) for HD engines based on minimal testing. While we understand the desire to ensure that vehicles maintain their lower NOx performance throughout the FUL, the costs of implementing such long warranties are relatively unknown and will therefore increase the financial risk to component suppliers as OEMs push the longer warranty requirements on the supply base. In addition, many emissions components that have a shorter life and are routinely replaced due to wear should not be covered under by the warranty requirements.

  MEMA opposes the Alternative Option as it could harm suppliers, places unnecessary strain on the industry, and lacks research and technical support as already indicated by EPA.

- **Reduction in Proposed Warranty Time Periods/Mileage and Full Useful Life Timelines**

  MEMA urges EPA to reduce the proposed warranty requirements and the full useful life timelines for all vehicles. The warranty increases of a factor of four or more are based on

specific and limited laboratory testing that does not reflect complex, real-world use. Additionally, more data and analysis of second and third vehicle owner usage should be conducted before proposing significantly longer warranties and FUL timelines. Furthermore, EPA should consider increasing the compliance margins for in-use standards.

- **More Component Data is Needed on Full Engine Aging**
  Most of the agency's laboratory work concentrated on aftertreatment aging rather than full engine aging. As a result, data regarding the impact of engine aging on components such as exhaust gas recirculation, camshafts, fuel injectors, turbochargers, piston rings, sensors, and electronics is lacking.
- **Significant Uncertainty with Longer Warranties**
  Longer warranties on criteria emissions systems put unknown and potentially massive risks on the motor vehicle parts manufacturing industry, which could result in significant price increases on vehicles.
- **More Testing and Validation is Required on Vocational Applications**
  EPA's envisioned increases in warranties and full useful life requirements on vocational vehicles are less validated than other commercial vehicles, with little to no testing and verification conducted on these uses. The real-world uses for heavy-duty vocational vehicles are different and extremely complex because of the vast range of duty cycles, load configurations, and application demands. Thus, more testing and validation of assumptions is necessary before greatly increasing the warranty time periods/mileage and FUL on vocational vehicles.
- **Maintenance Parts Versus Warranty Covered Parts**
  MEMA urges EPA to not require warranty coverage on parts that have a shorter life and are routinely replaced due to wear, such as sensors, injectors, rings, filters, and valves. Instead, such parts and components should be defined as standard maintenance or replacement items. We urge EPA to work with industry stakeholders, including suppliers, to develop a list of wear parts and components with these criteria in mind.
- **MEMA Opposes NOx Credits for BEVs and FCEVs to Prevent Backsliding**

  MEMA encourages EPA to not issue NOx credits for battery electric vehicles or fuel cell electric vehicles to avoid unintended backsliding and lowering of technology deployment on internal combustion engine heavy-duty vehicles.

MEMA Comments

MEMA Supports Option 1 with Modifications to Warranty Time Period/Mileage, Covered Warranty Parts, and FUL

MEMA supports an NOx rule that relies on certification cycles and in-use tests that better represent real-world use and will encourage best-in-class technology adoption while effectively meeting lower NOx emissions requirements. MEMA supports Option 1 with important modifications to warranty time period/mileage, covered warranty parts, and FUL. MEMA believes the technology exists to comply with this emissions standard and it also has a two-step approach to implementation. The staged approach will be beneficial and allow time to gain significant additional data as we approach the second step in 2031.

MEMA urges EPA to reduce the proposed warranty requirements and the full useful life timelines for all vehicles. The warranty increases of a factor of four or more are based on specific and limited laboratory testing that does not reflect complex, real-world use. Additionally, more data and analysis of second and third vehicle owner usage should be conducted before proposing significantly longer warranties and FUL timelines.

MEMA is also concerned about the lack of data regarding vocational applications and the difficulties that this will cause. Vocational applications could also be regulated as a separate category.

EPA is essentially asking industry to design parts without clear functional requirements - well past their current state-of-the-art design life. Frequency of failure past the design life is relatively unknown and therefore, the costs are also unknown. MEMA recommends EPA not require warranty coverage on parts that have a shorter life and are routinely replaced due to wear, such as sensors, injectors, rings, filters, and valves. Instead, such parts and components should be defined as standard maintenance or replacement items. We urge EPA to work with industry stakeholders, including suppliers, to develop a list of wear parts and components with these criteria in mind.

Furthermore, EPA should consider increasing the compliance margins for in-use standards to make up for the lack of real-world in-use data.

MEMA recommends that each HD manufacturer's fleet have a not to exceed limit (NTE limit) on individual vehicles by class to avoid very high emissions vehicles being permissible as part of the overall fleet.

MEMA opposes the Alternative Option as it could harm suppliers, places unnecessary strain on the industry, and lacks research and technical support.

New Technologies Required

EPA suggests that new emission control technologies (i.e., not based on CDA and a dual SCR) would be needed to meet the Alternative NOX standards for Heavy HDEs. MEMA opposes the Alternative Option and agrees with EPA that not enough data and research has been done to support this Option.

Regarding EPA's request for comments on whether technologies are available that would enable a PM standard lower than 5 mg/bhp-hr, MEMA does not yet view this as a workable option due to the lack of specific supporting data and the fact that it is even more stringent than the CARB Omnibus. Further testing is required to determine if current technologies are capable of reaching this lower PM standard.

Testing Hybrid Engine and Powertrain Together

EPA also requests comment on the proposed clarification in 40 CFR 1036.101(b) that gives manufacturers the option to test the hybrid engine and powertrain together, rather than testing the engine alone. Specifically, the agency has asked for feedback on whether EPA should require all hybrid engines and powertrains to be certified together, rather than making it optional. MEMA agrees that an engine-only test does not show the benefits of hybrid technology, so this is a good additional option. However, this option should not preclude engine-only or powertrain-only testing and certification.

Test cycles should be modified to be more reflective of real-world conditions including transient, steady state, and high-speed steady state. This is especially true in the areas of lower speed, transient, and stop and go conditions where hybrids can provide the most significant benefit. MEMA supports EPA requiring an idle cycle for all powertrains with accountability for hybridized systems. Any idle certification cycle should encourage available technologies like start-stop and engine off coasting, also known as sailing.

Proposed Duty Cycle Changes

With regard to EPA's request for comments on several aspects of the proposed new LLC duty cycle for heavy-duty CI engines and applying the SET duty cycle to heavy-duty SI engines, much of the impact of this is on the engine certifier. MEMA would like to highlight the fact that accessory loads are very impactful to thermal management systems - especially during low load cycle conditions. New certification cycles should accurately quantify and reward contributions of technologies to fuel efficiency improvements and NOx emissions reductions. MEMA recommends that EPA develop unique considerations for vocational vehicles with regard to correct accessory loading to reflect real-world use.

Off-Cycle Standards

EPA is requesting comment on several aspects of the proposed off-cycle standards for heavy-duty CI engines, including the levels of the standards in proposed Options 1 and 2 and the specific operating range covered by each bin, and whether off-cycle standards and in-use testing should also apply for SI engines. MEMA supports new HD NOx emissions standards and additional test cycles that will drive additional NOx emissions reductions on the road and encourages best-in-class technologies. These standards should be performance-based and technology-neutral and the test-cycles should reflect real-world use of vehicles. Both the standards and test cycles should enable multiple technology paths to achieve compliance. In addition, similar standards are important between CI and SI to avoid the unintended consequences of truck buyers switching between CI and SI as a way to "game" the regulatory standards.

Avoid Breakpoints in Evaporative Emissions Control

For SI engines, EPA requests comment on their proposed refueling HC emission standard for incomplete vehicles above 14,000 lb GVWR, including requests for comment and data to inform test procedure updates. EPA should consider measuring HC emissions from these larger fuel systems and vehicles. MEMA also recommends avoiding "break points" in the standards that could result in intentionally shifting a vehicle to a higher GVWR class to reduce emissions compliance equipment. In essence developing a continuum of standards and technology applications rather than a sharp break or jump. MEMA also recommends that on-board vapor recovery technology be required. SI engines should have the best available evaporative emissions control technologies. In addition, higher truck classes should use all available lower truck class technologies.

In-Use Testing Through Full Useful Life

EPA also requested comment on whether they should finalize interim standards for testing used to verify that the engine meets the standards through its useful life. Unfortunately, significant additional testing is required. Much of SWRI's recent research focused on aftertreatment aging, and therefore was not as focused on full engine aging. As a result, not as much data is available on EGR aging, cam wear, fuel injection holes, turbochargers, oil control rings, etc. In addition, due to the variety and complexities of real-world use, many vocational cycles have very different demands

resulting in an unknown statistical performance distribution. Estimating full commercial vehicle impacts based on this limited SWRI testing could be problematic – especially for vocational vehicles. Also, the industry does not have near as much data regarding 2nd and 3rd vehicle owner usage. As a result of these shortcomings, MEMA recommends that EPA include significantly more compliance margin for in-use testing standards.

Extending Full Useful Life and Emissions Warranties Pose Major Challenges

MEMA members have concerns about the uncertainty regarding 7- and 10-year emissions warranties. MEMA strongly supports a phased-in approach as this helps address suppliers' need for adequate lead-time to understand and improve component durability. Suppliers would take on significant cost implications early in the timeline. They currently do not have access to the necessary data to assess and make improvements. EPA should provide data on HD vehicles on the road today including higher quality data on usage patterns.

In addition, suppliers also require drive and duty cycle data from second and third truck owners as well as vocational vehicles to more fully understand those use cases and successfully design components to meet them. However, MEMA does support incremental changes in the warranty time periods/mileage including a series of step changes based on additional data and with the assumption that normally replaceable emissions components would be left out of the warranty coverage. The lack of data on 2nd and 3rd truck users is especially concerning in terms of warranty coverage. Many older trucks that are repurposed into specialized vocational applications, like dedicated snowplow trucks, may sit for months before the next use. MEMA is concerned about using a one-size-fits-all approach to a very complex set of use cases.

The proposed standards will result in increased warranty costs. Some OEMs don't even return parts to suppliers. Even if parts are returned, they only provide data on failed parts, with little or no data on surviving components. Different components have dramatically different service lifetimes. Considering this, MEMA recommends an interim review before the second phase. Suppliers have real concerns about the longevity of DEF sensors, and other electronic sensors. EPA should designate certain replaceable parts as maintenance service items rather than as warranty service items. Having such a long warranty on new vehicles, will drive significant additional costs into the vehicle purchase price for additional warranty coverage due to the lack of data as well as known additional costs based on part life. This may result in pre-buys of older technology or owners keeping their trucks for extended times versus buying new vehicles.

In addition, MEMA recommends an hours limit on all implemented standards in addition to mileage.

Proper Maintenance

MEMA is supportive of the EPA's suggestion that their proposed provisions will increase the likelihood that emission controls will be properly diagnosed and maintained through more of the service life of heavy-duty engines as this seems logical. See comments above about designating more parts as service parts versus warranty parts.

Durability

EPA also requested stakeholder input on their proposed approaches for the durability demonstration that manufacturers are required to include in their application for certification. Highly Accelerated Life Testing (HALT) does not provide good data on the frequency of a failure's

occurrence. Longer warranty terms may lead to higher costs and EPA data may significantly underestimate the cost impacts due to limited or extrapolated data. We do not have enough data to support this and even if a vehicle passed durability testing, certain in-use duty cycles may have additional failures. OEMs may have the required information, but typically not part and system suppliers. We are not the best group to comment on this, but we are concerned.

MEMA Opposes BEVs or FCEV Generation of NOx Credits to Prevent Backsliding

MEMA encourages EPA to not issue NOx credits for battery electric vehicles or fuel cell electric vehicles to avoid unintended backsliding and lowering of technology deployment on internal combustion engine heavy-duty vehicles. In addition, NOx credits have traditionally only gone to engine certifiers. Opening this up to additional parties could result in a fundamental change to the NOx credit program with significant unintended consequences. Not many companies make both batteries and internal combustion engines to be able to transfer credits within one company. This generates more questions than answers and may open the door to backsliding.

Harmonization with CARB Omnibus Rulemaking

EPA requests comments on whether it is appropriate to harmonize the federal and CARB regulatory programs more in light of the authority and requirements of CAA section 202, and the benefits or challenges if EPA were to finalize particular aspects of its program that are or are not fully aligned with the Omnibus.

MEMA strongly discourages any technology mandates (i.e., avoid ZEV mandates). In addition, it would be helpful for the EPA to use broader, more flexible definitions of emissions reducing technology. Then the industry can design to performance-based standards and users' unique requirements. As we have advocated in the past, it would also be beneficial to look at the entire lifecycle rather than just "tailpipe" emissions. As vehicles become significantly more fuel efficient, both upstream and downstream emissions become much more important when attempting to truly compare them. Significant infrastructure requirements would also come along with these rules, so if EPA were to try to match CARB there would need to be significant coordination with DOE in terms of planning for the national electric grid.

Emission Reduction Calculations and Repair Cost Estimates

EPA is interested in stakeholder input on their approach for estimating emission reductions from lengthening useful life and warranty periods and on their estimate of repair costs for emission control system components. MEMA would suggest that the analysis is very mileage focused. Data from a minimum of 75,000 miles/year and a maximum of 144,000 miles/year was used to make all repair model estimates. The effects of continued usage outside of that range is unknown. In addition, significantly more repair is required for many vocational applications being performed in rough environments.

Environmental Justice

MEMA urges EPA to consider the impacts of NOx emissions on underserved and inner-city communities. While all communities are impacted by climate change and air quality, the effects on communities of differing socioeconomic statuses are not proportionate. Historically, environmental policies, including but not limited to electric vehicles, engine emissions standards, carbon emissions trading or taxation, chemical bans or restrictions and other industrial regulations, may have caused disproportionate harm to disadvantaged communities. It is critical that EPA finalize NOx standards

that will ensure all commercial vehicles, not just electric vehicles, are equipped with best-in-class technology to ensure that every community is afforded cleaner air.

Comments Regarding HD GHG Phase 2 Program Updates

In Section XI, EPA requests comments in a number of areas related to the proposed updates to the HD GHG Phase 2 program for certain heavy-duty vehicles that are shifting to zero-emission vehicles. EPA is considering whether it would be appropriate in the final rule to increase the stringency of the standards even more than what EPA proposes.

MEMA opposes a national ZEV mandate and recommends continuing with a technology neutral, performance-based HD GHG standards approach as we have today. BEV penetration levels may reach higher levels faster or slower than expected. Therefore, MEMA recommends separate GHG requirements for ICE vehicles rather than the entire fleet (including BEVs and FCEVs) to avoid unintended backsliding and lowering of technology deployment on internal combustion engine heavy-duty vehicles. In addition, if BEVs and ICEs are combined in the fleet averages and BEV forecasts are off the mark, the result will lead to significant regulatory uncertainty.

Heavy-Duty Sales Projections

Per EPA's request for information on heavy-duty electric vehicle sales projections, including for what HD vehicle types, to help inform their HD electric vehicle sales projections in the MY 2024 through MY 2029 timeframe, MEMA urges the EPA to avoid regulations that allow backsliding on ICE technologies to make sure that ICE vehicles are as clean as current technology will allow.

Regarding more stringent standards beyond MY 2027 - specifically in MY 2028 and MY 2029 using the methodology described in Section XI.C.1, MEMA believes that these forecasts will be quite volatile and uncertain. Therefore, we don't want an optimistic or incorrect ZEV forecast to distort the market in the future. Establishing regulatory certainty is very important to the supply base that is developing the necessary advanced emissions technologies.

Conclusion

MEMA supports a NOx rule that relies on certification cycles and in-use tests that better represent real-world use and will encourage best-in-class technology adoption while effectively meeting lower NOx emissions requirements. Therefore, MEMA recommends Option 1 with modifications to warranty time period/mileage, covered warranty parts, and full useful life as well as modified standards for vocational vehicles.

MEMA urges EPA to reduce the proposed factor of four increase in warranty requirements and the full useful life timelines for all vehicles until more data is available to justify such a substantial increase. More testing and validation of assumptions is necessary before increasing the FUL and this is especially true for vocational vehicles.

Wear items should be defined as standard maintenance or replacement items and therefore not covered by a warranty. We urge EPA to work with industry stakeholders, including suppliers, to develop a list of wear parts and components with these criteria in mind.

For more information, please contact Catherine Boland, vice president of legislative affairs (202-312-9241 or cboland@mema.org) or Brian Daugherty, chief technology officer (248-430-5966 or bdaugherty@mema.org).