



February 20, 2019

California Air Resources Board
1001 I Street
Sacramento, CA 95812

RE: Zero-Emission Airport Shuttle Regulation and Zero-Emission Powertrain Certification Regulation

Dear Chairwoman Nichols and Members of the California Air Resources Board,

Motiv Power Systems appreciates the opportunity to provide comments on the Zero-Emission Airport Shuttle Proposed Regulation and Zero-Emission Powertrain Certification Proposed Regulation. We strongly support the goals of one of these regulations, however the linked regulatory package damages the integrity of both, and ties a flawed proposal that has unquantified costs and impacts with one which is urgently needed. Adoption of the Zero-Emission Airport Shuttle Rule if modified would expand upon the foundation laid by the Innovative Clean Transit rule as a key component of California’s policy portfolio of solutions enabling a transition to zero emission vehicles to protect public health, our air quality, climate goals, and local jobs. However, adoption of the Zero-Emission Powertrain Certification Regulation would increase costs, reduce product options coming to market, slow technology transfer, refocus engineering efforts from customer requested features to features that are compliance-driven and aren’t market needs, and the net impact of these changes would slow urgently needed emissions reductions.

As a California based small business and manufacturer developing zero-emission all-electric chassis for medium- and heavy-duty vehicles, we know firsthand how essential good policy has been to supporting sustainable solutions and the advance technology ecosystem here in California. Motiv’s all-electric chassis are presently used in vehicles ranging from school and shuttle buses to delivery trucks and work trucks, and even book mobiles and medical outreach vehicles, allowing fleets zero-emission solutions that improve the local air quality, help meet the state’s climate goals, and eliminate the need for fossil fuels.



Examples of Motiv’s electric vehicles available today.

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We strongly support adoption and implementation of strong regulations as needed to cut harmful emissions, and have testified to this effect in a variety of rule makings as well as offered support of legislative goals of environmental stakeholders and incentive plans to further those aims. We strongly support CARB's work in past rules like the ICT and goals to have a 100% zero-emission fleet by a set date. Those targets are reasonable, feasible, and appropriate to ensure transit riders see the opportunities to enjoy zero-emission vehicles in their communities. However, in this rulemaking package we are extremely concerned by three main issues:

1. Linking the Zero-Emission Airport Shuttle to the Zero-Emission Powertrain Regulation
2. The lack of cross-policy analysis of how the Powertrain Regulation would impact the costing and implementation of the Airport Shuttle Regulation
3. A complete lack of evidence to support the assumptions of the need for a Zero-Emission Powertrain Regulations as well as the outcomes expected in terms of costs, operational impacts, emissions, technical merits, and market outlook.

If the Zero-Emission Airport Shuttle bus rule is unlinked from the Zero-Emission Powertrain, Motiv strongly supports the concept and believes it is feasible, cost effective, and appropriate. If unlinked from the Zero-Emission Powertrain rule, the compliance schedule could even be accelerated prior to 2035, as having the first target begin in 8 years is significantly slower than when action should begin to effectively meet our air quality goals. Motiv thinks it would be feasible to match the ICT rule with early stage purchase requirements at 2023.

The urgency with which we must meet these emissions reductions targets in transportation presents a problem that is reflected by many programs within CARB's portfolio of polices. In CARB's 2018 Progress Report for the California Sustainable Communities and Climate Protect Act staff succinctly summarized *"With emissions from the transportation sector continuing to rise despite increases in fuel efficiency and decreases in the carbon content of fuel, California will not achieve the necessary greenhouse gas emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built."* This is a stark warning, and given the lag in how some of our emissions targets are failing to be met, the urgency with which we control those which we can control increases.

As a manufacturer of zero-emission chassis that can be used in cutaway applications and have been in use for the last three years, we know first-hand the timelines for procurement and contracts with transit agencies are longer than with private fleets, and private fleets if motivated are able to meet these needs on accelerated timelines compared to what this rule assumes.

While there is a difference in the amount of planning that will be needed for a fleet transformation when compared to selling a single vehicle, we believe this rule offers adequate timing for service upgrades as needed to meet the operational needs.

Motiv also strongly supports the continued access and funding of incentive programs through the length of this transition. Programs like HVIP and the LCFS credits provide valuable resources to help fleets offset the upfront capital costs needed to make the transformation to zero-emission solutions which benefit all. Long term funding support should be maintained to allow smoother planning and a faster transition to 100% zero-emission solutions.

As a company, Motiv's mission is to **Free Fleets From Fossil Fuels**. This regulation if amended would support that mission, so we would support this rule. California's ongoing commitment to being a climate leader, investing in advanced technologies, and supporting communities are key to what has made California the hub of technological leadership in automotive technology, and if modified this Zero-Emission Shuttle Bus rule would fit within that legacy. As a company part of this ecosystem we recognize



the integrated nature of the policy portfolio and its successes to date and it is with this in mind we'd support the regulation.

If the rule is passed unlinked from the Zero-Emission Powertrain Regulation, staff's of analysis and cost trade-offs as they relate to the 929 airport shuttles regulated would stand. However, the number of vehicles that would be impacted by this rule according to CARB's rulemaking package would not be 929 airport shuttles, but rather the market assessment of all commercial vehicles and growth potential of zero-emission powertrains to meet the needs of the 510,405 CVRA Trucks, as it would signal the ZEP proposal currently being considered by CARB will become the market standard and thus impact all CVRA Trucks. (per DMV Statistics from JANUARY THROUGH DECEMBER 2017). When building a market forecast for the growth and market for a component the total market size is considered not just the niche application that may be the first market entry point. Staff analysis does not account for the forecast of growth, investment impacts, time for technology transfer, or other application emissions that would be less likely to happen if powertrain costs were to rise rather than decline at this time.

It is only for this linking to the Zero-Emission Powertrain Regulation that Motiv cannot support this Zero Emission Airport Shuttle Regulation as written, as the costs and impacts associated with that measure would outweigh the benefits of this regulation. By passing the ZEP rule CARB would slow progress on many key initiatives and increase the costs associated with zero-emission technologies, ultimately making internal combustion engines and business as usual scenarios more likely. Such a policy would ultimately harm our emissions and air quality goals as a state by slowing progress and refocusing engineering time from core features to compliance reporting, and thus if that measure is linked to the airport shuttle bus regulation Motiv opposes both. A separate letter will be respectfully submitted with formal feedback on the ZEP rule measure.

Thank you for the opportunity to provide feedback and we look forward to continuing to work with staff and stakeholders in support of California's clean air and climate goals.

Sincerely,

A handwritten signature in black ink, appearing to read "Urvi Nagrani". The signature is fluid and cursive, written over a white background.

Urvi Nagrani
Director of Business Development
Motiv Power Systems



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Dear Chairwoman Nichols and Members of the California Air Resources Board,

Motiv Power Systems appreciates the opportunity to provide comments on the Zero-Emission Airport Shuttle Proposed Regulation and Zero-Emission Powertrain Certification Proposed Regulation. We strongly support the goals of these regulations to improve reliability and customer experience, while moving California towards a sustainable future. However, the linked regulatory package damages the integrity of both and ties a flawed proposal that has unquantified costs and impacts with one which is urgently needed. Adoption of the Zero-Emission Powertrain Certification Regulation would increase costs, reduce product options coming to market, slow technology transfer, refocus engineering efforts from customer requested features to features that are compliance-driven, slow CARB's own beachhead investment approach, and the net impact of these changes would hinder efforts to cut emissions.

As a California based small business and manufacturer developing zero-emission all-electric chassis for medium- and heavy-duty vehicles, we know firsthand how essential good policy has been to supporting sustainable solutions and the advance technology ecosystem here in California. Motiv's all-electric chassis are presently used in vehicles ranging from school and shuttle buses to delivery trucks and work trucks, and even book mobiles and medical outreach vehicles, allowing fleets zero-emission solutions that improve the local air quality, help meet the state's climate goals, and eliminate the need for fossil fuels. We have worked with CARB staff through a variety of regulatory changes from the Approval Letter process for vehicles, the Approval Letter process for a powertrain, and securing the first Executive Order for an electric chassis. Unfortunately, the regulatory process around vehicle electrification has not been as smooth of a process as CARB's investment strategy, and often leads to delays of market introductions of zero-emissions solutions, extending the business as usual period in which fleets use diesel alternatives.

Motiv strongly supports adoption and implementation of strong regulations as needed to cut harmful emissions, and have testified to this effect in a variety of rule makings as well as offered support of legislative goals of environmental stakeholders and incentive plans to further those aims. We strongly support CARB's work in past rules like the ICT and we support California's goals to have a 100% zero-emission fleet by a set date. Those targets are reasonable, feasible, and appropriate to ensure transit riders and all Californians see the opportunities to enjoy zero-emission vehicles in their communities. However, this rule fails to provide the same value we would expect to see from CARB, and we urge the board to reconsider this rule's intent and need, as there are still philosophical debates in the workgroup as to what question CARB is hoping to solve with this regulation, how this approach would achieve those outcomes, and given that uncertainty it's not surprising the solution fails to effectively advance the mission. While we thank CARB staff for their work to date to improve on the initial draft, and for substantive changes to make it more palatable, this rulemaking is not where it needs to be to achieve

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the desired outcomes. We would strongly encourage the board to extend the timeline to allow staff time to revise the measure to avoid harmful consequences and refocus efforts on ways to streamline ZEV compliance to allow for faster deployments and the improved air quality, rather than more onerous reporting which neither improves our air quality nor the cost effectiveness of small businesses entering the ZEV market.

Within page one of the executive summary, it is noteworthy that staff defines this rule as both “CARB’s **technology-forcing** regulatory measures” and that this “pathway is being **proposed as optional**, but it would serve as a defined process developed with public input that, once adopted, **could be made mandatory by other zero-emission measures**,” As such our analysis will assume that this regulation will in fact be both technology-forcing, and eventually mandatory through linkages with other rules. An eventual mandatory rule makes this regulation one that will theoretically apply to all zero-emission vehicles at some point, and thus the market impact must be one which considers how that will link to the entirety of the California vehicle market if we are to make a successful transition to a zero-emission future. If this rule is not being analyzed in this lens, it should not be adopted as it could link many successful programs to a harmful framework, and damage the policy portfolio.

In considering CARB’s role in regulating vehicles, it is important to remember CARB has historically limited the emissions associated with operation to permissible levels. The durability of components and requirements pertaining to vehicles emissions components are to ensure that for the longevity of the vehicle life, the vehicle continues to comply with air quality regulations. The safety of vehicles has never been the primary mission of this agency, as the safety of vehicles is covered by The National Highway Traffic Safety Administration (NHTSA) in the Federal Motor Vehicle Safety Standards (FMVSS). This distinction is important as if CARB has historically regulated only emissions components on vehicles and those that change the emissions performance of a vehicle, and not all automotive components. Zero-Emissions Vehicles are unique in that there are no emission components on the vehicle. If CARB is to expand its focus into regulating electric vehicle powertrains, every component on an electric vehicle as related to propulsion will have dual reporting requirements to different agencies, which would increase compliance costs from the status quo without offering any additional benefits in the way emissions components regulations protect our air quality.

There is no part failure on a zero-emission vehicle which leads to the vehicle having emissions. Unlike vehicles with emissions, a change in operational efficiency doesn’t cause the vehicle to fall outside permissible emissions level. Safety standards already exist and FMVSS recalls would still apply to any part failures that could cause the vehicle to be unsafe. It is unclear what an additional CARB regulation would do in this case to improve the product or help customers, as the emissions characteristics of the vehicle would be unchanged between a ZEP certified zero-emission vehicle and a zero-emission vehicle without a ZEP certification.

CARB’s mission as CARB’s own about page describes is that, “The California Air Resources Board (CARB) is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change.” Increasing the costs of zero-emission vehicles to comply with additional regulations despite the fact they do not have harmful air pollution expands the regulatory scope of this agency without achieving the desired outcome of emissions reductions. While CARB’s authority to regulate engines and emissions systems is clear, the regulatory oversight of non-emitting vehicle components that do not change the ability of the vehicle to have emissions would be an expansion.

The Californian market dynamic has shifted over the last decade thanks to younger companies who only manufacture zero-emission systems and vehicles, which has proven the technology is feasible and pushed the market to expand into the ZEV space. As small companies prove these products are possible

and begin to expand, it also shifts the consumer and fleet expectations of what is possible. These smaller companies have had less access to capital for expansion than legacy solutions, and expanding regulations to zero-emission vehicles and systems would add new costs that have not historically existed or been part of those business models. These costs would be spread across new ZEVs being sold, increasing costs of emerging zero-emission technologies when compared to baseline diesel vehicles which have both greater market penetration and economies of scale to help spread those costs across a larger fleet. This increases the incremental costs of a new zero-emission vehicle when compared to the business as usual scenario. The current regulatory package does not include any cost analysis to show what this challenge would do to California's plans to meet urgent air quality and emissions targets, nor does it include any analysis of how those increased incremental costs would impact the state's investments. Particularly for small business who seek to deploy in early incentive markets, an expansion of this rule to those space would reduce opportunities for early market traction, and the certification process would lead to costs that would extend across a small number of vehicles, leading to a higher incremental cost per vehicle.

California's investments in early stage research enabled many small companies including Motiv to prove out technical concepts that have now been utilized in many partnerships with major OEMs. Whether it's TransPower working with Meritor and Peterbilt, EDI being acquired by Cummins and utilized in Blue Bird Buses, Motiv and Lighting Systems working with Ford's eQVM program, or Proterra working with Daimler – there are many examples that show having smaller companies with an engineering focus and lower upfront compliance costs can accelerate the research and development of zero-emissions solutions and increase consumer choice. Increasing the upfront compliance costs needed to enter the incentive marketplace would disproportionately hurt smaller companies with less access to capital, and would be counter to legislative intent in designing transportation electrification goals.

Specifically, in SB 350, De León. Clean Energy and Pollution Reduction Act of 2015 the text explicitly states, "(2) It is the policy of the state and the intent of the Legislature to encourage transportation electrification as a means to achieve ambient air quality standards and the state's climate goals. Agencies designing and implementing regulations, guidelines, plans, and funding programs to reduce greenhouse gas emissions shall take the findings described in paragraph (1) into account." Within paragraph one it unambiguously states, "(F) Widespread transportation electrification should stimulate innovation and competition, enable consumer options in charging equipment and services, attract private capital investments, and create high-quality jobs for Californians, where technologically feasible."

Stimulating innovation and competition is not achieved through increasing the costs making it harder for smaller companies to enter the market. Furthermore technology-forcing measures reduce the ability for new innovative solutions to be deployed, and the specific language in this measure presently are intended to be technology-forcing per CARB's own summary, without considering the diversity of customer needs. Specific measures within this regulation such as the standardization of how diagnostic information is to be collected, do not allow for advances in cloud computing to improve upon the vehicle diagnostics. Similarly needing to submit a new powertrain application when integrating new batteries, motors, regenerative brakes, would increase the time and costs associated with the ability for new component providers to sell their solutions to OEMs, integrators, or end user fleets. This would impact every supplier who seeks to be part of the movement towards a sustainable transportation future. This is clearly ignored in the "STAFF REPORT: INITIAL STATEMENT OF REASONS PROPOSED ALTERNATIVE CERTIFICATION REQUIREMENTS AND TEST PROCEDURES FOR HEAVY-DUTY ELECTRIC AND FUEL-CELL VEHICLES AND PROPOSED STANDARDS AND TEST PROCEDURES FOR ZERO-EMISSION POWERTRAINS" which only cites the 16 companies already in the market being affected in 2021. Suppliers for these companies would be impacted by warranty and diagnostic requirements, as would those companies

themselves. Staff also assumes there would be 2 new companies per year manufacturing, and they do not include the very real risk that companies would need to either be consolidated, acquired, merged, or reduce their product offerings to be resourced well enough to focus adequate resources on compliance.

There is a reason the diversity of industry voices in the workgroups to date have found much to critique in this process. Whether a global OEM or a small Californian business, the costs and impacts will be significant, and the analysis supporting the need for such a measure is weak. Staff simply says, "Staff's proposal is not expected to eliminate any businesses. In addition, while the proposed ZEP Cert regulation could result in some expansion of existing businesses, it is not expected to create any new businesses." There is no evidence to support that assumption that businesses would be immune from the costs and risks, and the assumed continued market growth doesn't consider new barriers to entering incentive markets.

An example of how this measure increase costs can be seen in the documentation piece in which documentation is assumed to have no cost. Staff writes "In addition, there would also be per-vehicle costs associated with the proposed vehicle certification requirements. Specifically, staff's proposal would require each vehicle to be labeled as certified and delivered with an owner's manual that contains specific information about the vehicle and service centers. The proposed regulation requires the vehicle and powertrain manufacturer to separately create owner's manuals but allows the option for creating a combined owner's manual. **Staff assumed the fixed cost for the owner's manual would be absorbed by the vehicle manufacturer. The estimated label costs and owner's manual modification are \$80 and \$25, respectively, per vehicle.**" This assumption doesn't include the time needed to acquire the level of technical expertise needed to produce a manual, the cost of that labor, or the scarcity of technical experts with the knowledge. The experts who are capable of doing this work are also those designing these systems, and increasing the time they are working on documentation reduces their ability to design and expand the technical solutions available.

Furthermore, the cost of a label or a manual is not in the physical document or sticker, but rather in the cost of integrating the requirements contained within those pieces. If a manufacturer wanted to sell 1 new vehicle application which is technically feasible (for example a modification of a previously certified system with an upgraded motor) – this would be a new family. This new family would need new documentation, a new submission to CARB, and a manual for the owner would be its own documentation project. Upon approval this would then need to be released from a certification team to manufacturing with updated Bill of Materials for this variation. The build documentation produced by engineers for a technician would not be a user facing manual, so that manual production would be a new cost on top of non-recurring engineering costs. This would then also need to be communicated to support so the reporting for recalls and warranties could be done, and a support technician would need to input any service documentation to a system tracking service events to vehicle families. The change isn't in just the cost of the manual, but in the process, as changes would be needed to support that change in model year. These would make a technically feasible zero-emission project less likely by increasing the already present incremental costs of expanding into new applications, integrating a new component, or expanding into low volume markets. This makes it more likely that once designed the product remains unchanged, reducing the ability of electric vehicles to utilize the newest components, push new features, and release technical solutions upon the completion of engineering validation. Overall this hurts the goals of increasing innovative solutions and supporting new technology development. If the goal CARB seeks to achieve is zero-emission everywhere technically feasible, each additional cost that would increase the price of a ZEV as compared to a baseline diesel should be seen as yet another factor that would limit the market.



The lack of cross-policy analysis of how the Powertrain Regulation would impact the costing and implementation of the Airport Shuttle Regulation is also a cause for concern. Even within the first measure to be tied to this Zero-Emission Powertrain regulation there is a complete lack of evidence to support the assumptions of the need for a Zero-Emission Powertrain Regulations as well as the outcomes expected in terms of costs, operational impacts, emissions, technical merits, and market outlook. For example, in their analysis seen in “Figure C-1: Incremental Costs of Replacing Internal Combustion Shuttles with Equivalent ZEVs” there is no cost increase to reflect the ZEP rule costs in acquiring new ZEVs. There is also no assumed increase in customers between the 2023 year and the years in which the rule would be in place – so the cost basis for these regulatory changes wouldn’t be shared across a larger number of vehicles. Furthermore, the assumption of increased warranty costs to manufacturers doesn’t reflect in any decrease in maintenance savings for fleets with these vehicles. If the ZEP rule is truly going to have the lack of cost impacts staff predict, those known costs and savings should at least be integrated into the measures that would make it mandatory. However, given those costs seem to be significantly under-estimating the true cost, it would likely be better to unlink the measures so the business as usual cost assumptions in the Airport Shuttle Rule are accurate.

As a company, Motiv’s mission is to **Free Fleets From Fossil Fuels**. This regulation would harm that mission by making it more expensive to support the diversity of fleets who could otherwise use our technical solutions. We oppose this rule because it would make it harder to meet California’s ongoing climate commitments, it could reduce investing in advanced technologies, it could limit the ability for new small companies to enter the sustainable technology marketplace, and through increased costs make it harder for communities to access zero-emission solutions. California is a hub of technological leadership in automotive technology, and this rule would not fit within that legacy. As a company part of this ecosystem we recognize the integrated nature of the policy portfolio and its successes to date and it is with this in mind we oppose the regulation.

Thank you for the opportunity to provide feedback and we look forward to continuing to work with staff and stakeholders in support of California’s clean air and climate goals.

Sincerely,

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