January 31, 2018

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, California 95814

RE: Proposed California Greenhouse Gas Emissions Standards for Medium- and Heavy-Duty Engines and Vehicles and Proposed Amendments to the Tractor-Trailer GHG Regulation

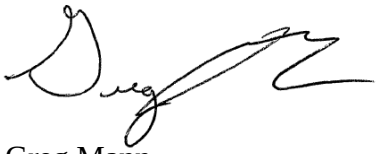
Dear Sir/Madame:

Allison Transmission, Inc. ("Allison") submits these comments with regard to the above-referenced rulemaking concerning greenhouse gas ("GHG") standards for medium- and heavy-duty vehicles.

Allison Transmission is the world's largest manufacturer of fully automatic transmissions for medium- and heavy-duty commercial vehicles, and is a leader in hybrid-propulsion systems for city buses. Allison transmissions are used in a variety of applications including refuse, construction, fire, distribution, bus, motorhomes, defense and energy. The company has developed over 100 different models that are used in more than 2,500 different vehicle configurations and are compatible with more than 500 combinations of engine brands, models and ratings (including diesel, gasoline, natural gas and other alternative fuels). Globally, in 2016, Allison sold an estimated 60 percent of all fully automatic transmissions for commercial-duty vehicles. The company is headquartered in Indianapolis, Indiana and has a market presence in more than 80 countries. Additionally, Allison has approximately 1,400 independent distributor and dealer locations worldwide.

Allison appreciates the opportunity to comment on the California Air Resources Board ("CARB") pending revisions to title 13 and 17 of the California Code of Regulations ("CCR") to incorporate the U.S. Environmental Protection Agency's ("EPA's") 2016 "Phase 2" GHG standards for medium- and heavy-duty engines and vehicles as well as to make other changes to California's existing engine and vehicle standards. Allison supported and worked with the EPA for several years during the development of the Phase 2 program and similarly is available to assist CARB with respect to its current effort. Allison is uniquely qualified to address issues related to automatic transmissions, hybrid systems, idle reduction technology, vocational vehicles as well as bus applications (*i.e.* transit and school bus). We would be pleased to continue working with CARB as your regulatory process moves forward.

Respectfully submitted,



Greg Mann
Director, Mobile Source Emissions Regulatory Activities

Allison Transmission, Inc. Comments on Proposed
GHG Standards for Medium- and Heavy-Duty Engines and Vehicles

January 26, 2017

I. Advanced Technology Credits

CARB has proposed to adopt, but significantly alter existing EPA Phase 2 provisions allowing for advanced technology credits. Specifically, CARB has proposed that in order to receive an advanced technology "multiplier" for advanced technology emission credits, a manufacturer must demonstrate that its use will not result in increased nitrogen oxide ("NOx") emissions.

CARB has provided several rationales for this action. With regard to hybrid vehicles, CARB indicates that the additional criteria is intended to "give manufacturers additional incentive to ensure NOx emissions from certified hybrid vehicles do not exceed levels from similar conventional-powered vehicles." (Initial Statement of Reasons ("ISOR") at II-6). But in order to show that NOx emissions do not increase, CARB is proposing to impose additional testing requirements:

> Testing for NO_x emissions could be accomplished through chassis dynamometer, portable emission measurement system (PEMS), or powertrain testing using the prescribed test cycles, or an approved alternate test cycle. For chassis dynamometer testing, four different test procedures would be allowed depending on the vehicle/engine duty class and whether the hybrid vehicle has electric power take-off (ePTO), as referenced in Appendix E of the Innovative Technology Regulation (ITR) (CARB, 2017d). For PEMS testing, the ITR PEMS testing provision would be used. The AER for PHEVs would be determined in accordance with the procedures provided in the ITR. Alternatively, a manufacturer could petition CARB's Executive Officer to approve an alternative test method and/or duty cycles that they believe would be more applicable for their technology and intended vocational vehicle placement.

Id. at III-21.

Allison appreciates that CARB's objective is to make gains in reducing GHG emissions while, at the same time, avoiding an increase in NOx emissions that could affect ambient air quality. We believe, however, that CARB should reconsider whether a blanket requirement for "no increase" in NOx is feasible under all circumstances and whether it will actually accomplish the twin objectives of reduced GHGs and preservation of local air quality.

Our concerns with the proposed limitation on advanced technology credits lies in the substantial barriers which still remain for hybrid adoption in the medium- and heavy-duty sector. Allison previously commented on EPA's proposed Phase 2 rule that there are multiple barriers to hybrid adoption in the commercial sector:

> To achieve an overall 5% adoption rate of hybrid technology, the economics of the hybrid ownership would have to substantially change over the period of time covered by this rulemaking [2019-2027]. Sustained progress in reducing battery

> costs would be needed along with decreases in motor costs, and progress in reducing inverter costs. In addition, other external elements would be needed such as a significant increase in fuel cost (to increase demand) and/or additional subsidies for hybrid vehicle purchases. Past history concerning hybrid adoption should breed caution. For example, even though transit buses have had hybrid systems available for over a decade (supported in many cases by subsidies), the adoption rate of hybrids in the U.S. transit bus market is only 13.2%.

(Allison Comments on EPA Proposed Phase 2 rule, EPA-HQ-OAR-2014-0827 at 46).

CARB should also recognize that investments for heavy-duty hybrids will largely be made by component suppliers, not vehicle manufacturers. This means that there is a different incentive structure in this sector than other sectors, where production of the vehicle is much more integrated by and through an original equipment manufacturer (like the light duty vehicle sector). Additionally, to the extent additional emphasis is placed on controlling NOx emissions from a hybrid vehicle, relatively less reductions may be achieved in carbon dioxide ("CO_2") emissions.

Finally, additional testing requirements related to the advanced technology credits could also serve as a significant disincentive within the commercial hybrid market. Although CARB provides flexibility with respect to the testing of NOx emissions, any additional testing will directionally decrease incentives to produce hybrid systems and increase barriers towards greater adoption of the technology within commercial truck and bus markets.

Allison therefore recommends that CARB allow for additional flexibility with regard to any NOx requirement for hybrid vehicles. Rather than create a "bright line" demarcation of allowing no increase in NOx, CARB should allow an opportunity for those seeking credit multipliers to demonstrate that the overall environmental performance of a hybrid versus comparable conventional vehicle is deserving of additional incentives. On a case-by-case basis, CARB could consider that small incremental increases in NOx are offset by greater fuel efficiency and less GHG emissions for the amount of work accomplished by the vehicle. It could then approve use of the credit multiplier on this basis.

II. Other Bus Standards

EPA Phase 2 standards allow certain custom chassis manufacturers to certify vehicles to less stringent standards than would otherwise apply to vocational vehicles. CARB is proposing to retain this option for most vehicles covered by federal requirements, but not to allow such certification for transit buses without additional, supplementary testing. CARB provides two reasons for this disparate treatment: (a) options for transit buses to meet more stringent standards are available through hybridization or electrification adoption; (b) allowing less stringent standards to apply to transit buses would act as a disincentive to increased electrification and hybridization of the transit bus fleet. Specifically, CARB indicates that

> Both battery and fuel-cell electric buses are commercially available for transit applications . . . In California, there are already nearly 450 fuel cell and battery electric buses in operation or on order (CARB, 2017). Due to the generous advanced technology credits in the Phase 2 program, a transit bus manufacturer can meet the

> primary vocational standards by manufacturing relatively few zero-emission buses (no more than two percent of their total production).

ISOR at ES-9.

As CARB acknowledges, the rationale for the optional, less-stringent provisions in EPA's Phase 2 regulations was based on an assessment that manufacturers of custom chassis vehicles could have difficulty in complying with the standards given the limited number of technologies available and the inability of such manufacturers to take advantage of compliance flexibility (averaging). *Id*. While Allison respects CARB's intention of promoting zero-emission vehicles as a way of addressing the state's broader commitment to reduce statewide GHG emissions by 40 percent in 2030, the market conditions for custom chassis vehicles have not substantially changed in the time period since EPA finalized the Phase 2 rule in October, 2016.

As with respect to the proposed limitation on advanced technology credits, Allison believes a path forward towards meeting CARB's objectives -- while recognizing the unique nature of the custom chassis market -- is to allow for a reasonable degree of flexibility in its implementing regulations. Without such flexibility, Allison would be concerned that the additional regulatory burden in this area will impose disproportionate expenses on small manufacturers and ultimately hinder innovation in the category. Specifically, CARB should continue to allow for an ability to certify transit buses utilizing a simplified version of the Greenhouse Gas Emission Model ("GEM") where GEM inputs are fixed to default values. *See* 40 C.F.R. 1037.520; 81 Fed. Reg. 73,478, 73,537 (Oct. 25, 2016). We encourage CARB to work with transit bus manufacturers to formulate solutions and methods to provide such additional flexibility prior to finalization of the proposed rule.

III. "Deemed to Comply"

CARB is proposing a fundamental change in its approach to compliance with medium- and heavy-duty GHG emission standards. As opposed to issuing an Executive Order on the basis of a federal Certificate of Conformity, CARB proposed to end its "deemed to comply" approach to certification of medium- and heavy-duty engines and vehicles. Manufacturers will be required to submit certification information directly to CARB and CARB will independently review such information prior to issuing an Executive Order allowing introduction of the engine/vehicle into commerce within the state. While California has adopted federal testing procedures, CARB has proposed to require that additional information be submitted to the Board (beyond that required for a Certificate of Conformity). CARB is also proposing additional requirements related to emission control identifiers, pollutant measurement techniques and other matters that go beyond federal requirements. CARB Notice of Public Hearing at 7-8; Appendix E, E16-24.

Part of the rationale for adopting an altered approach to certification stems from the perception that California "cannot rely on federal review of applications for engine and vehicle certification." ISOR at ES-7. But CARB also acknowledges that the requirement to obtain additional state certification of federally-certified engines and vehicles could result in delays. *Id*. In this regard, CARB suggests that an expedited certification option might be available to manufacturers who provide additional in-use data. *Id*. at ES-8, III-13.

Allison certainly respects CARB's ability to independently verify that vehicles and engines meet state GHG standards. The current relationship between the State of California's and the federal government's motor vehicle emission standards dates back to the 1967 Air Pollution Control Act.

And over the years, different approaches to federal and California implementation of engine and vehicles have taken place. But CARB should be careful to distinguish as between what information may be necessary to certify and enforce medium- and heavy-duty GHG standards and what other information may bear some relationship to vehicle emissions, yet be much less useful for this purpose or lack a clear connection towards improving the performance of CARB's vehicle GHG programs.

Collecting additional information and imposing additional certification requirements has several impacts, the first being the additional cost and delay that could result from processing two separate applications for the same engine/vehicle. Outside of these costs, differing federal and state regulations will also inherently increase the burden of assembling relevant information (potentially from multiple vendors using different methods to collect such data). This raises issues with respect to how available and useful the information will be -- both to the state and California consumers.

From the point of view of the regulated community, regulatory uncertainty also increases given the possibility that additional data requests might be expected as a "logical outgrowth" of the new compliance structure for vehicle certification. Indeed, CARB suggests that additional options might be pursued in this area and "included in a future upcoming rulemaking." *Id.* Prior to that time, however, Allison would also question allowing for expedited consideration of an E.O. based on the "voluntary" provision of additional in-use data.

There are two issues with allowing for expedited E.O. considerations. First, given that an E.O. is required prior to the introduction of a vehicle into commerce, in at least some cases, companies may be reluctant to risk going to the "back of the line" for such a necessary approval. Thus, the voluntary submission might be viewed as close to a mandatory requirement or another imbedded cost of doing business. Second, given that it is unclear what in-use data might be requested, it is possible that an un-level playing field could be created as between companies that may have greater resources to generate such data and provide it to CARB and those smaller companies that may lack the resources to avail themselves of the option for expedited consideration of their E.O.

In this regard, given the unique nature of the medium- and heavy-duty industry, CARB should be mindful that incremental compliance burdens will not, in all likelihood, be shared evenly across all OEMs and component suppliers. And merely because data may be directly collected from individuals, businesses or fleet operators, it should not be assumed that this data will be truly dispositive for the purpose of determining in-use compliance or what additional steps should be undertaken to address emissions.

CARB should therefore more thoroughly assess the relative impact of any new requirements with regard to smaller entities, including component manufacturers. CARB may certainly choose the appropriate balance as between the costs of this new certification system and its benefits, but in order to do so, it needs to have more information than it currently has with respect to the pending rulemaking. CARB should endeavor to complete a fulsome assessment of available alternatives to what it has proposed in this area before proceeding.