09-1-8

Steven Douglas

Alliance OF AUTOMOBILE MANUFACTURERS

January 21, 2008

Clerk of the Board
Air Resources Board
1001 I Street
Sacramento CA 95814

Subject: Plug-In Hybrid Electric Vehicles Test Procedure Amendments

Dear Chairperson Nichols and Board Members:

The Alliance of Automobile Manufacturers is a trade association of 11 car and light truck manufacturers. We appreciate the opportunity to provide comments on the Plug-In Hybrid Electric Vehicle (PHEV) test procedure amendments. This letter provides specific recommendations to streamline the proposed PHEV test procedures and reduce the testing burden on a very promising technology. We discussed these recommendations with ARB staff and will work with them to develop specific regulatory language implementing the recommendations.

Before providing specific comments on the test procedures, we want to specifically thank the ARB staff for their work and cooperation with industry. The test procedures for PHEVs are some of the most complicated at ARB since they govern existing technology combined with an entirely new technology. The testing burden on automakers is still very high, but the work over the past year by auto engineers and ARB staff resulted in test procedures that ensure vehicles meet the emission standards while limiting the testing burden. Your staff has been responsive and cooperative throughout this effort. While we recommend additional changes to streamline the procedures and additional changes will undoubtedly be necessary, once we have more experience with this technology, we generally support the proposed procedures.

Finally, before providing our specific recommendations, we would like to provide some perspective for the board on how PHEVs fit into the 30 year continuum of emission reductions and our march toward zero emission vehicles.

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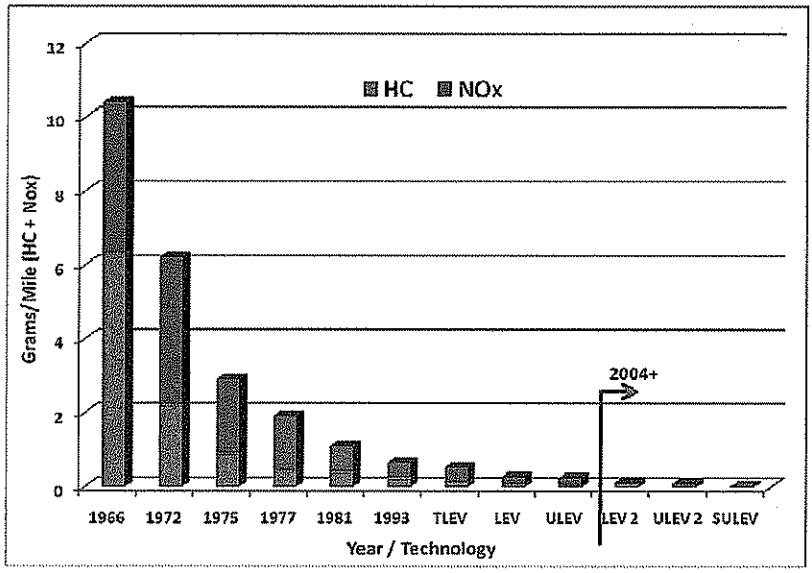
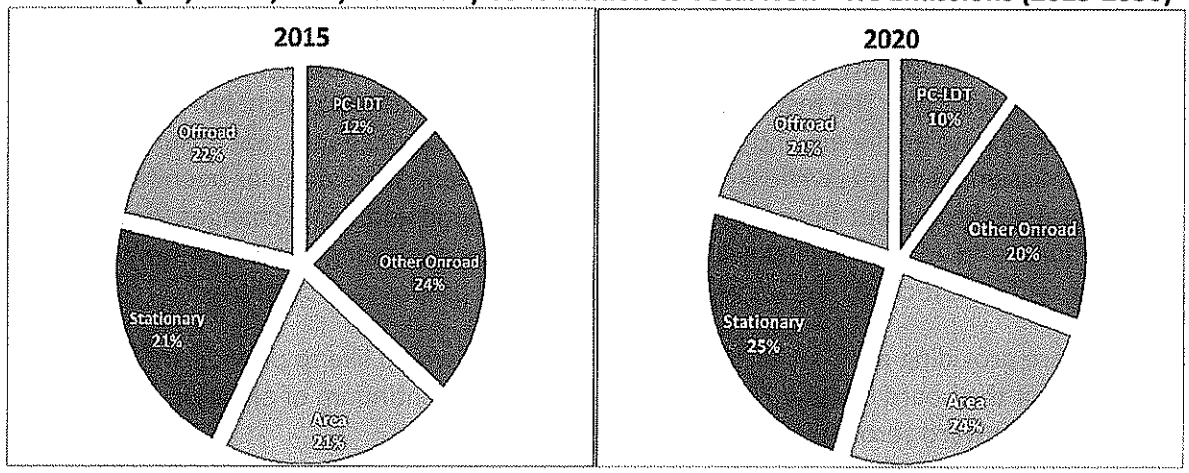
1415 L Street—Suite 1190, Sacramento, CA 95814 • Phone 916.447.7315 • Fax 916.447.7349 • www.autoalliance.org

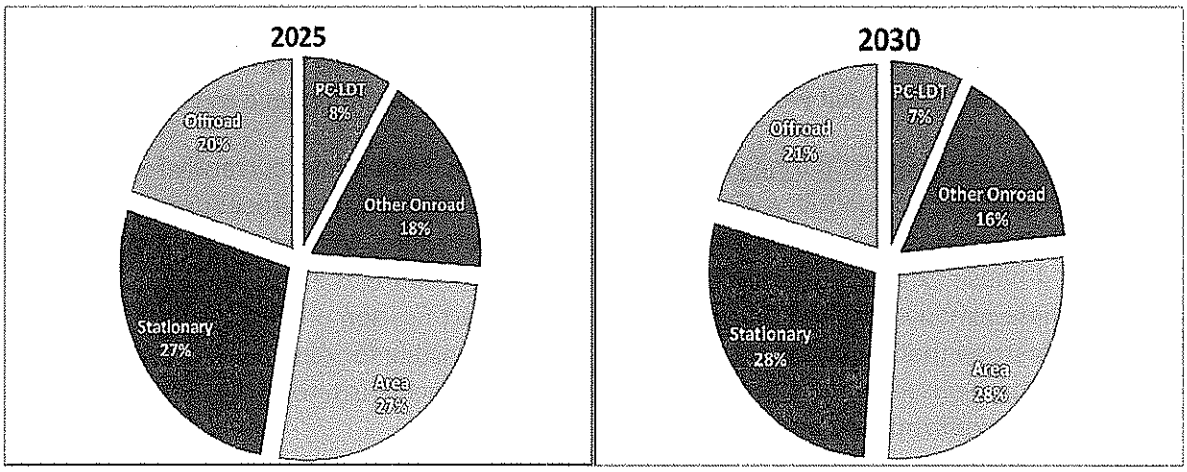
For the past three decades, automotive engineers from Detroit to Japan to Germany have spent countless hours and resources perfecting emission control systems that all but eliminate criteria pollutants. The chart below shows 30 years of progress:



As a result of this progress, cars and light duty trucks are becoming a small part of the total criteria emissions in California. The following charts show the contribution of vehicles compared to other sources over the next 20 years, based on our calculations using the most current requirements for the sources listed:

PC-LDT (Car, Truck, SUV, Mini-Van) Contribution to Total NOx + HC Emissions (2015-2030)





We provide this background to show how far we have come, and to say that despite the historical down turn in the economy shaking the very foundation of the auto industry, manufacturers are committed to provide the cleanest, safest, most efficient products possible while meeting the needs and demands of California and the nation.

This brings us to our specific recommendations on the PHEV Test procedures. As we initially noted, we support the test procedures and believe that the following changes streamline and improve the procedures by reducing the testing burden on manufactures without jeopardizing in-use emissions. We specifically recommend the following changes to the proposed PHEV test procedures:

1. Data Measurement and Reporting Requirements: Measuring and reporting data is a time consuming process that adds complexity and taxes our limited resources. Manufacturers understand that data is essential to the certification process; however, because of the extraordinary testing complexity imposed, data requirements should be driven by three factors and answers to the questions:

    a. Essential to certification: Is the information absolutely essential to certify the vehicle?

    b. Data contained on a label: Is the information required on a consumer information label?

    c. ZEV Credit Calculation: Is the information needed to determine ZEV Credits?

    In today's economic climate, manufacturers are faced with optimizing limited resources. There is a vital need to eliminate the gathering of data that does not meet at least one of these certification criteria. We have identified a number of data requirements that fall into this category and request ARB delete them from the test procedures.

We request ARB confirm that data measurement and reporting not meeting at least one of these criteria should be eliminated. We have provided staff with a number of these already and will work with them to identify any we may have missed.

2. 4-Phase exhaust test during evaporative testing: The regulations currently require a manufacturer to conduct a 4-phase exhaust test for the exhaust procedure and then a 3-phase exhaust test as part of the evaporative procedure. We recommend allowing the 4-phase exhaust test during the evaporative procedure as a way to eliminate the 3-phase exhaust test and thereby streamline the certification procedure. It is understood that manufacturers would still be responsible for designs that can comply with the 3-phase exhaust test and that CARB has a mechanism to verify compliance through confirmatory testing.

   We request ARB allow the 4-phase exhaust test as an option during the evaporative procedure.

3. Urban and Highway Test provisions: The proposed procedures require that "Vehicles w/more than one mode of operation for a given charge depleting or charge sustaining test cycle must be tested in the mode(s) which represent maximum operation of the auxiliary power unit." This could result in up to 6 times the normal number of test cycles for a mode of operation that might not be the mode with highest emissions; thus, the manufacturer would have to test the maximum APU operation mode AND the worst-case emissions mode. In other parts of the test procedures, manufacturers are allowed to reduce testing burden through good engineering judgment, to test ONLY one mode of operation and provide an engineering attestation that this is the worst-case emissions mode. ARB still has the authority to test in different modes, and manufacturers are liable if the tested mode is not worst case.

   For the urban and highway tests, we request the option that is proposed for 50° NMOG testing and highway testing - use of good engineering judgment to determine our worst-case emissions mode and provide CARB with data under this mode and an engineering attestation of compliance.

4. Charge Sustaining Test – 1% SOC vs. 1% Fuel Energy: Under current regulations, during "charge sustaining tests" the high-voltage battery cannot discharge more than one percent (1%) of the maximum fuel energy consumed during the test (i.e., fuel energy from the gasoline engine). This criterion worked fine for current hybrids with a large power generation source (engine) compared to the battery capacity. However, going forward that relationship reverses (small engine, large battery capacity, i.e. PHEV's) and it will be common for the fuel energy consumed to be less than 1% of the nominal battery capacity. It will be very difficult to control the battery charge to this level. Consequently, it will be increasingly difficult to pass a charge sustaining test as battery capacity increases and fuel energy consumed decreases.

We recommend adjusting the criteria from 1% of fuel energy consumed to the maximum of either 1% of the fuel energy consumed or 1% of the nominal battery capacity. This proposal could be applied to all hybrids, not just PHEV's.

5. Equivalent All Electric Range (EAER): EAER is needed for ZEV VMT credits. Since this is not an emissions compliance issue, there is not a strong need for extensive testing (high precision) to arrive at values that feed into the VMT credits. Manufacturers should have the option to use an abbreviated process to arrive at EAER.

    a. We can effectively meet the ZEV VMT measurement goal (EAER) through less testing and with appropriate accuracy and precision, by testing for a rate of battery depletion and using usage battery capacity. Such methodology is used for CNG range testing and is being proposed by CARB for FCV range testing.

    b. Use of an abbreviate method would likely result in a shorter EAER, and therefore be protective of CARB's VMT credit methods. Use of the first 2 FTP4 cycles (instead of the number necessary to fully deplete the battery system, which could be significantly higher) incorporates changes in vehicle warm-up and is a reasonable estimate for the rate of charge depletion.

    We propose determining rate of charge depleting over FTP4 test cycle (or 2) and extrapolating equivalent all-electric range based on battery system capacity (engineering design spec for the range of charge depletion from full charge to charge sustaining mode), as an option to a full range depletion test.

6. Bag Mini Diluter (BMD): The regulation appears to allow only a CVS system to dilute and sample exhaust from the vehicle. We have an approved alternative to use the BMD system for testing.

    We request the test procedures allow the option of a BMD for testing.

7. FCV Range Test: We requested ARB optionally allow the use of SAE J2572 for Fuel Cell Vehicle (FCV) range testing. We appreciate ARB adding this flexibility, but the proposed regulation requires the SAE J2572, rather than allowing it as an option.

    We request SAE J2572 test procedure as an option rather than a requirement for FCV range testing.

8. Definition of V_{system}: The proposed definition indicates that system voltage must be monitored during transient operation and the average value at zero current be considered the V_{system}. We believe the definition below is more technically accurate definition and better aligns with the direction of the SAE J1711 committee.

We recommend the following definition:

V_{system} = Open circuit voltage (OCV) that corresponds to the SOC of the target SOC during charge sustaining operation.

Aftermarket Conversion: Finally, we note that the test procedures contain provisions for aftermarket conversion kits. These procedures help support a basic provision of the Clean Air Act (Sect 203), that converted vehicles must not result in an adverse impact to our environment. Automakers spend enormous resources ensuring that vehicles meet emission levels so low that just a few years ago, these levels could not even be measured. We spend additional resources monitoring the entire emission system to ensure they meet the standards throughout the useful life, and still more to warranty the parts and systems as required by California law. California consumers have come to expect this in the systems certified by ARB. It is entirely reasonable for consumers to expect the same from aftermarket conversions. It is entirely fair and reasonable that ARB impose the same requirements on conversion kit manufacturers as it imposes on the vehicle manufacturers. Consequently, we support the aftermarket regulations proposed.

In conclusion, we appreciate the work and cooperation by ARB staff, recommend the minor changes above to streamline the procedures, and look forward to working with ARB in the future. If you have any questions, please feel free to contact me at (916) 447-7315 or at sdouglas@autoalliance.org.

Sincerely,

Steven P. Douglas

Steven P. Douglas
Senior Director, Environmental Affairs