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GlobalAutomakers

April 6, 2016

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

Subject: On-Board Diagnostic (OBD) Regulations – Proposed 15-Day Changes

Dear Clerk of the Board:

We are writing on behalf of the Alliance of Automobile Manufacturers (Alliance)[1] and Association of Global Automakers, Inc. (Global Automakers)[2] representing nearly every car and light-truck manufacturer in the United States. In California, our combined members represent about 99% of the new vehicle market. Subject to the four recommendations in this letter, we support the changes to the OBD regulations proposed in the 15-Day Notice of Proposed Revisions to the On-Board Diagnostic System Requirements issued March 21, 2016 (hereafter "15-Day Notice").

Before providing our comments, we want to thank the ARB Staff for their hard work on these regulations. The OBD regulations are probably the most technically complex regulation governing vehicle emissions. Yet, over the past two years, we have discussed, debated, and exchanged data, presentations, and papers on virtually every element of consequence in the regulations. ARB staff has been readily available, many times on relatively short notice, to discuss each element – many times at length and over multiple meetings. While we might not agree on all of the final requirements, this is not because ARB staff failed to honestly consider our recommendations and concerns. We sincerely appreciate their professionalism and hard work.

The remainder of this letter addresses the four issues related to the 15-Day Notice (unless otherwise noted, page numbers refer to Attachment A of the 15-Day Notice):

1. **Cold-Start Denominator for PHEVs (page 9, (d)(4.3.2))**: Sections (e)(10.2.2)(C) and (f)(11.2.2)(C) (see Appendix A of the ARB Staff Initial Statement of Reasons (ISOR) released August 4, 2015) states: "the OBD II system shall detect a malfunction if the ECT [engine coolant temperature] sensor inappropriately indicates a temperature below the highest minimum enable temperature required by the OBD II system to enable other diagnostics…" (emphasis

[1] Alliance members are BMW Group, FCA U.S., Ford Motor Company, General Motors, Jaguar Land Rover, Mazda, Mercedes-Benz USA, Mitsubishi Motors, Porsche, Toyota, Volkswagen, and Volvo.

[2] Global Automakers' members include Aston Martin, Ferrari, Honda, Hyundai, Isuzu, Kia, Maserati, McLaren, Nissan, Subaru, Suzuki, and Toyota.

added) The ECT sensor monitor requires that the gasoline engine operate to increase temperature before the detecting a malfunction.

The in-use performance ratio (IUPR) requirements specified in §1968.2(d) are designed to ensure monitors operate sufficiently in use. The requirements are specified as a ratio roughly as follows:

$$\frac{Number\ of\ times\ monitor\ completes\ (pass\ or\ fail\ decision)}{Number\ of\ times\ monitor\ has\ an\ opportunity\ to\ operate}$$

Thus, for an accurate IUPR, the denominator must be specified such that the monitor has an opportunity to operate. In the case of the ECT sensor monitor on a plug-in hybrid electric vehicle (PHEV), this means that the denominator should only be incremented if the gasoline engine operates (called "fueled engine operation").

Section (d)(4.3.2)(L) (page 9, 15-Day Notice), requires incrementing the denominator of the engine cooling system input components in (e)(10.2.2) or (f)(11.2.2) if and only if, the requirements of Section (d)(4.3.2)(K)(i) through (iii) are met. However, these sections do not contain any requirement for fueled engine operation (FEO). Consequently, the engine cooling system input components may not have an opportunity to operate. The requirement for fueled engine operation is contained in Section (d)(4.3.2)(K)(iv).

We recommend the following change to Section (d)(4.3.2)(L)(i), which would increment the denominator for engine cooling system input component monitors only after fueled engine operation.

> (i) The requirements of section (d)(4.3.2)(K)(i) through (iv) have been met for the evaporative system purge flow monitor (section (e)(4.2.2)(A)) and the engine cooling system input component rationality monitors (sections (e)(10.2.2)(C) and (D) and (f)(11.2.2)(C) and (D)) and (f)(11)) , or the requirements of section (d)(4.3.2)(K)(i) through (iii) have been met for all other monitors specified in section (d)(4.3.2)(L) above;

2. **EGR Stall on Idle (page 13, (e)(8.2.4))**: In our September 23, 2015 comments on the August 4, 2015, ISOR, we proposed the OBD system would not be required to detect a high-flow exhaust gas recirculation (EGR) malfunction if the malfunction caused the vehicle to stall immediately during idle operation. ARB exempts positive crankcase ventilation (PCV) monitoring if the vehicle immediately stalls on idle.

   The rationale for this recommendation is a driver will repair a vehicle that stalls (i.e., engine dies) immediately during an idle condition. Alternately, if the driver does not repair the vehicle when the engine dies on idle, certainly a "check engine" light will not persuade them to repair the vehicle.

The 15-Day Notice is somewhat confusing, but appears to allow an exemption (with Executive Officer approval) to monitoring for high-flow EGR malfunctions when the vehicle immediately stalls at idle, but requires the manufacturer to demonstrate that high-flow EGR failure would be detected during all other driving conditions.

We believe our previous point that the driver will repair a vehicle that stalls on idle is valid and that monitoring during other driving conditions is unnecessary to ensure proper repair. Moreover, since a diagnostic requires two trips to illuminate the MIL, even if the monitor can detect a malfunction during all other driving conditions, the vehicle will not have an opportunity to run the monitor during subsequent driving conditions if the vehicle stalls on idle.

We recommend deleting the two sentences highlighted below:

(8.2.4) For 30 percent of 2019, 60 percent of 2020, and 100 percent of 2021 and subsequent model year gasoline vehicles in which no failure or deterioration of the EGR system that causes an increase in flow could result in a vehicle's emissions exceeding the thresholds specified in section (e)(8.2.2), the OBD II system shall detect a malfunction when either the EGR system has reached its control limits such that it cannot reduce EGR flow to achieve the commanded flow rate or, for non-feedback controlled EGR systems, the EGR system has maximum detectable EGR flow when little or no EGR flow is expected. Manufacturers may request Executive Officer approval to not detect the failure or deterioration if monitoring is not possible because the vehicle has immediately stalled during idle conditions. ~~Executive Officer approval shall be based on data or engineering analysis demonstrating that the failure or deterioration of the EGR system is detected under all other driving conditions. If the failure or deterioration can only be detected under idle conditions, the manufacturer must provide data or engineering analysis demonstrating that the failure or deterioration cannot be detected under other driving conditions.~~

3. **Typographical errors**: The following two items appear to be typographical errors.

   a. **DEC ECU Definition (page 3, (c))**: We believe the highlighted sentence should read, "For the purposes of criteria (1) through (3) above" or maybe "For the purposes of criteria (2) and (3) above…" both (2) and (3) discuss "input component" and "output component" but (1) does not.

statistics or commands MIL illumination or fault code storage). Further, ~~F~~for purposes of criterion (2)~~(e)~~ above, all glow plugs in an engine shall be considered "one" component in lieu of each glow plug being considered a separate component. For purposes of criteria (1) and (2) above, "input component" and "output component" includes hybrid components required to be monitored in accordance with the requirements under section (e)(15.2.1), (e)(15.2.2), (f)(15.2.1), or (f)(15.2.2).
* * * *

   b. **Freeze Frame (page 45, (g)(4.3.2))**: "number of warm-up cycles…" is duplicated in this section.

distance traveled since fault memory last cleared, and ~~number of warm-up cycles since fault memory last cleared and~~ number of warm-up cycles since fault memory last cleared, DEF sensor output, commanded DEF

We appreciate the opportunity to comment on the regulations. If you have any questions or need additional information, please feel free to contact us. As always, we look forward to continuing to work with you.

Sincerely,

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