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January 24, 2013

California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Re: ARB regulation 1971.1

The Santa Clara Valley Transportation Authority (VTA) wishes to express its deep concerns about ARB regulation 1971.1 and its impact on the future progress of diesel hybrid buses in California.

VTA appreciates the patience that the ARB has shown as Diesel hybrid technology has advanced slowly the past ten years. The existence of the HVIP program demonstrates ARB’s high regard for the potential benefits of increased diesel hybrid usage. We all hoped for faster commercialization, lower costs and greater technological improvements as we anticipated increased market penetration of diesel hybrid vehicles.

However, the hoped-for market expansion of diesel hybrids has been slower than anticipated, resulting in diesel hybrid technology being at a less mature stage at this point than anyone expected. Any regulatory efforts that discourage further hybrid use will keep the hybrid market in this immature state for a longer time, leading to less development of the kind of technology integration that would make comprehensive OBD much more practical to design and to certify.

So while we appreciate the extension to 2014 of the requirement for a single party (engine, hybrid drive or bus manufacturer) to certify that the OBD standards for the entire system are met, in the heavy duty transit bus market this requirement is, unfortunately, still unrealistic.

By not extending the deadline for compliance further, as the EPA has done to 2016/17, the effect of this proposed action will be to eliminate further expansion of heavy duty diesel hybrid transit buses in California. This will force transit properties to buy straight diesel engines, resulting in the unintended consequences of higher GHG emissions and increased fuel usage.

This is very complex topic, as the following paragraphs show. It is affected by technology and economics in multiple ways. But that complexity is why the EPA has granted a delay in this area, and is why VTA requests that the ARB do so as well.

VTA understands the ARB’s frustration that the subsidies provided in the HVIP program have not been met with sufficient efforts in technological integration that would allow for straightforward compliance with the OBD requirements. However, VTA also would like to point out that no heavy duty transit bus is included in the approved HVIP vehicle list, and that the hybrid systems used in the vehicles that are on the list have been found unsuitable (the Eaton system used on most of them simply does not fit when the engine is in the rear) for any heavy duty bus.

The heavy duty bus market is a much smaller and more unique one than medium truck and cutaway buses, and therefore even if progress is made in the trucking hybrid markets, developments there would not automatically transfer over to the bus side.

Because the heavy duty transit hybrid suppliers, Allison and BAE, have not made strides in the trucking market, their volumes nationwide are low. Therefore their leverage with the only engine manufacturer in the heavy duty transit field, Cummins, is relatively low. Slicing those volumes further, by requiring a California-only design, leaves their leverage with Cummins reduced even more. If Cummins does not want to spend the engineering resources to work with them, there is nothing they can do.

Furthermore, from a business standpoint, cooperating with them may be out of the question for Cummins. The engineering needed would be as great as for more significant market segments, while the potential sales for California alone are far smaller. In fact, the engineering involved is likely greater for heavy duty transit, since a Cummins-Eaton design would cover most of the truck market, but Cummins would need to work with both BAE and Allison to cover the heavy duty transit market.

There might be a feeling that higher costs are something the taxpayer would be willing to pay, and therefore the manufacturers would be willing to add costs to cover the expense of the additional engineering. But the reason that hybrid technology is not gaining greater market share in heavy duty transit is precisely the high costs. Furthermore, making the case that higher costs are worthwhile, not for actual reduced emissions but for getting likely rare warnings of emissions equipment issues, is a more difficult proposition.

This brings up the next issue. VTA recognizes ARB staff concerns about the chance hybrid system controls could unintentionally subvert engine emission systems. It certainly is a possibility. However, it is a possibility that at this point is speculative. Understanding this, another ARB department is pushing forward with an investigation of in-vehicle testing for diesel hybrids, so that everyone can find out if there are problems with emissions from diesel hybrid vehicles. That testing protocol won’t be determined until the end of 2013, at the earliest. It would seem premature to require fixing a problem that could turn out to be non-existent once the testing protocol is completed and in-vehicle testing commences.

Especially since the inherent environmental benefits of hybrids are not in dispute. The lower GHG emissions due to significantly reduced fuel consumption are already proven. And since heavy duty diesel hybrid systems are rapidly being developed that allow for complete engine shutdown at idle, additional significant reductions in all emissions can be achieved, especially in transit where extensive idling at bus stops is unavoidable.

ARB staff expressed concern that some emission control strategies require input from the idle stage in order to correctly calculate overall emissions, and that therefore an engine shutdown at idle would interfere. However, the engine shutdown at idle features being proposed are designed to allow some idle in case of constant stop-and-go traffic, and to allow for bus comfort at layovers, up to the 5 minute limit. Therefore, while diesel hybrid transit buses so equipped will have dramatically reduced idling, they still idle at least as much as OBD compliant straight diesel trucks. This will make any issue with the emissions control strategies on the diesel hybrid transit buses very unlikely.

ARB staff’s other concern is that as hybrid systems age over time in service, their battery storage pack will start to deteriorate, forcing the engine to work harder and increasing emissions. However, all transit providers would notice the decrease in fuel mileage that would accompany such an event and immediately begin moving towards any necessary rehabilitation of the system battery pack. Both BAE and Allison anticipate precisely that, which is why they both offer 5 year warranties on their battery packs, and both offer battery rebuild kits that they anticipate will start to be needed after 6-7 years of service (experience to date at other transit properties nationwide indicate this is realistic).

Further, in the event of battery pack deterioration, the likely worst case is that the diesel hybrid bus would start to produce the same amount of NOx emissions as a straight diesel bus would have been doing for years if the hybrid had not been used. PM emissions are not currently affected either way by the hybrid system, due to modern control strategies focused on exhaust aftertreatment. However as noted above, they would be reduced by the engine shutdown at idle feature that can be achieved with diesel hybrids. The engine shutdown feature obviously makes any concern about emissions during that phase of non-operation irrelevant.

Staff may feel that their offer of allowing some deficiencies in 2014 will allow hybrid system manufacturers to meet their requirements. But that is both a high risk strategy for the manufacturers, depending as it does on staff’s judgment on the adequacy of their good faith efforts, and difficult to achieve.

One of the manufacturers at this point has some emissions related OBD features designed, but is unlikely to have only the few deficiencies allowed by the proposed regulation. The other manufacturer is somewhat further behind.

That manufacturer has a lower cost system that is the only competition that can have the effect of driving down hybrid prices, which is the pre-requisite for getting the necessary market growth of diesel hybrids in heavy duty transit. To ask them to reduce their current engineering efforts in the area of such things as electrification of on board components (which would further decrease fuel consumption and GHG’s) and their engine shutdown at idle feature, so that they can instead focus on meeting a California-only OBD requirement, would likely have the effect of having them withdraw from the California market.

Therefore, even if one of the heavy duty transit hybrid drive manufacturers does get ARB approval, it would leave California transit properties at the mercy of the higher cost supplier. Instead of the necessary price decreases to make diesel hybrids a better choice, further price increases in diesel hybrid drives would be very likely in order to recoup their OBD development costs, which would make buying diesel hybrids an economically unpalatable choice for the transit properties.

The ARB has clearly recognized the current and long term benefits of heavy duty diesel hybrid development in California. To achieve that development requires increased competition, which will lead to lower prices, which lead to increased sales, which would lead to further development of the technology, which will lead to the ability to have single certification of OBD equipment. ARB staff has previously recognized that process as being the necessary path to achieve the goal of hybridization of the State’s transit buses.

We’re all disappointed the process is taking longer than we had hoped. However, at this point, the change to the regulations which would best keep California on the path towards the goal is to make our regulations match those of the EPA in this area. Efforts to instead mandate speedier compliance for California alone at this point would be, unfortunately, counterproductive.

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