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February 16, 2022

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California Air Resources Board
1001 I Street
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Comments on "Low Emission Diesel (LED) Study: Biodiesel and Renewable Diesel Emissions in Legacy and New Technology Diesel Engines"

In response to the recently published "Low Emission Diesel (LED) Study: Biodiesel and Renewable Diesel Emissions in Legacy and New Technology Diesel Engines" and the associated notice, DTNA is providing the following feedback:

DTNA fully supports the use of Renewable Diesel (and blending with ULSD) as the chemical properties of this fuel have no adverse effects on the performance, emissions or durability of modern diesel engines (referenced as NTDEs in this study). Additionally, it is a well-known fact that biodiesel increases raw NOx emissions and this in turn increases tailpipe emissions passed through the after-treatment system. Our internal testing results align with the results of this study. This study further supports the need for appropriate screening practices during in-use and confirmatory testing, as supported by the EPA's regulation language on misfueling. DTNA would support the use of biodiesel with the future emission standards if there was an equivalent change in the finished biodiesel fuel properties regulation that would prevent such negative effects on the environment or performance and durability of the powertrain system.

Even though outside of the scope of this study, it is important to highlight that the long-term aging effects of biodiesel will further exacerbate the negative effects of biodiesel on the environment. The current fuel quality limits for stability and inorganic elements allowed by the ASTM fuel specifications are damaging to after-treatment performance and durability of the aftertreatment and other emissions control components. The inorganic elements found in biodiesel, even the smallest amount, have adverse poisoning effects on the after-treatment catalyst shortening the lifetime of the system. There are multiple on-going industry initiatives to close this ASTM specifications gap, which DTNA supports, and which we believe CARB should support.

The results of this CARB study highlight the technical challenges of meeting the new low NOx standards adopted in the CARB Omnibus regulation, and specifically, the challenges with the expectation that manufacturers comply with them using any commercially available fuels. The data used at SWRI to support the CARB Omnibus regulation does not account for adverse effects of biodiesel, either from the immediate emissions increases as demonstrated by this study, or from the long-term aging effects of biodiesel which are understood by the industry. These increases in emissions and associated harm to the environment are in the range of what DTNA would expect from biodiesel blends and are in opposition to both industry and CARB goals.

Additionally, when considering proposed blends of renewable diesel, biodiesel, and traditional ULSD, CARB should consider the chemistry and physics that govern blending outcomes. Renewable diesel fuels mix well with traditional ULSD, because they consist of the same hydrocarbon chain. These fuels, both individually and blended shed water and impurities well. Contrary to that, biodiesel and renewable diesel do not mix well. The culprit is the glycerin in biodiesel which is miscible with water, and therefore the blended fuel carries not only water but also impurities. This leads to fuel filter plugging, accelerated aging of after-treatment systems and ultimately increases emissions released into the environment. On a chemical level, to reduce the effect of this, any biodiesel fuel blendstock (B100) specification needs to include biodiesel distillation – otherwise, blends of biodiesel and renewable diesel could carry the same impurities, and cause the same long term degradation to emissions control systems, as biodiesel alone.

Finally, addressing remaining questions in the CARB Notice, DTNA believes that NTDEs and test cycles used in this study are sufficiently representative and confirm directional correctness of industry known immediate impacts of biodiesel. No current technology exists which can mitigate the short- or long-term effects of emissions degradation from biodiesel, and the results in this study confirm DTNA's experience in this matter.

DTNA believes CARB should further research negative emission impacts of biodiesel fuels, both in the short-term and in their effect of long-term degradation of emission control equipment. DTNA believes that information should inform the feasibility of new emission standards and should be considered before such fuels are approved or promoted.

We appreciate your consideration of our comments.

Sincerely,

Dan Potter
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Daimler Truck North America and Detroit Diesel Corporation