

**STATE OF CALIFORNIA  
AIR RESOURCES BOARD**

<b>Proposed Amendments to the Heavy-</b>	)	<b>Public Hearing Date:</b>
<b>Duty Engine and Vehicle Omnibus</b>	)	<b>August 27, 2020</b>
<b>Regulation and Associated</b>	)	<b>Public Availability Date:</b>
<b>Amendments; 15-Day Notice</b>	)	<b>June 18, 2021</b>

**COMMENTS OF THE  
TRUCK AND ENGINE MANUFACTURERS ASSOCIATION**

July 6th, 2021

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<b>Proposed Amendments to the Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments; 15-Day Notice</b>	)	<b>Public Hearing Date:</b>
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**Introduction**

At the August 27<sup>th</sup>, 2020 hearing of the California Air Resources Board (CARB), the Board passed a resolution to adopt the Heavy-Duty Engine and Vehicle Omnibus Regulations and Associated Amendments; and the Proposed Amendments to the Exhaust Emissions Standards and Test Procedures for 2024 and Subsequent Model Year Heavy-Duty Engines and Vehicles, Heavy-Duty On-Board Diagnostic System Requirements, Heavy-Duty In-Use Testing Program, Emissions Warranty Period and Useful Life Requirements, Emissions Warranty Information and Reporting Requirements, and Corrective Action Procedures, In-Use Emissions Data Reporting Requirements, and Phase 2 Heavy-Duty Greenhouse Gas Regulations, and Powertrain Test Procedures (collectively, the “Omnibus Low-NO<sub>x</sub> Regulations”). At that hearing, CARB Staff informed the Board of several recommendations for revisions to the regulations as released with the original Board Hearing notice. Those revisions (“30-Day changes”) were released by CARB Staff on May 5<sup>th</sup>, 2021, with public comments requested by June 4<sup>th</sup>, 2021. The Truck and Engine Manufacturers Association (“EMA”) submitted comments on those 30-Day changes. Subsequently, on June 18<sup>th</sup>, 2021, CARB Staff released additional proposed amendments in a 15-Day Change Notice. EMA hereby submits its comments on those proposed amendments.

EMA previously submitted extensive comments regarding the Omnibus Low-NO<sub>x</sub> Regulations (released with the August 27<sup>th</sup> Board Hearing Notice) on August 13, 2020.<sup>1</sup> Those EMA comments were data-driven and supported by third-party expert research, including studies prepared by the West Virginia University Center for Alternative Fuels, Engines and Emissions (“WVU”), Ramboll Group, ACT Research, and NERA Economic Consulting. EMA and its members stand by the conclusions set forth in our prior comments: the Low-NO<sub>x</sub> Omnibus Regulations are cost-prohibitive, infeasible, unenforceable, and illegal. The 30-Day changes did not address the serious overarching concerns that EMA detailed in its initial comments, nor do these latest 15-Day changes. Accordingly, it bears repeating that these supplemental comments are focused only on the 15-Day changes, and do not reflect the full breadth of EMA’s concerns related to the Omnibus Low-NO<sub>x</sub> Regulations as a whole.

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<sup>1</sup> Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments; Proposed Rulemaking; Initial Statement of Reasons, COMMENTS OF THE TRUCK AND ENGINE MANUFACTURERS ASSOCIATION, Tim French and Steve Berry, August 13, 2020.  
<http://www.truckandenginemanufacturers.org/file.asp?F=EMA+Omnibus+Comments+Including+Supplement%2Epdf&N=EMA+Omnibus+Comments+Including+Supplement%2Epdf&C=documents>

## **EMA's Comments Related to the New Flexibility Provisions of Title 13**

CARB has proposed new flexibility provisions to ensure that vital markets are not left unserved as manufacturers work to reconfigure their product lines to comply with CARB's rigorous new Omnibus Low NOx requirements. With barely two full years of lead time available to develop, verify and certify new designs to meet very stringent new standards, a new test cycle and in-use protocol, and other demanding requirements of a rule the likes of which the industry has never seen before, manufacturers will be forced to plan for staged product introductions extending beyond the regulations' first effective date (model year 2024). Recognizing the potentially damaging consequences of leaving important markets unserved, potentially forcing businesses and municipalities to maintain older, higher-emitting vehicles longer, CARB has proposed that manufacturers be permitted to sell a limited number of model year ("MY") 2023 compliant "legacy" engines into California in 2024 and 2025, with the obligation that they offset the excess emissions through narrowly defined mitigation pathways.<sup>2</sup> While the proposed flexibility provisions will be critical to avoiding extended gaps in product availability, the options available to manufacturers to recover the excess emissions from legacy engines will not provide manufacturers the needed certainty to use those flexibility provisions to maintain a robust market.

The 15-Day proposal constrains manufacturers who use the new flexibility provisions to a progression of credit-recovery methods for legacy engines. The first method available to manufacturers would be to offset legacy engine emissions with NOx and PM credits generated by each manufacturers' ZEV sales. If a manufacturer has not generated sufficient ZEV-based credits, the manufacturer would need to purchase credits from a ZEV powertrain manufacturer. Only if sufficient ZEV-based credits cannot be purchased at or below the threshold price established in the regulation would a manufacturer then be permitted to offset the deficit with NOx and PM credits generated from California engine sales starting in 2022 (or post-2009 federal credits converted to California credits under §86.xxx-15.B.3.) Finally, if US10 HDDE credits of the same averaging set as the legacy engine families are not available to the manufacturer, the emissions deficit would need to be recovered through an Executive Officer-approved mitigation plan focused on disadvantaged communities.

The cascading chain of emissions recovery methods proposed in the 15-Day draft are fraught with uncertainty. First, there is no guarantee that the ZEV products offered to the California market in the timeframe leading up to the certification of legacy engines, or during the 2024-2026 timeframe when ZEV credits "come due" according to the Omnibus regulatory provisions, will actually find buyers. This risk is even more concerning to any loose engine manufacturers not obligated under the ACT Rule. Moreover, the Omnibus Rule is so challenging, with so many compliance hurdles, that it is impossible to predict how critical a role ZEV-generated credits may play in diesel engine manufacturers' long-term compliance plans, making the future market availability of ZEV-based credits highly uncertain. It is also impossible to forecast what market price ZEV credits might bear, or whether they will be offered for sale at all<sup>3</sup>. Regarding the next alternative in the chain of allowable legacy emissions-recovery methods, HDDE-generated credits, it is well-known that, despite the US10 emissions standards having been in place for more than a decade now, no manufacturer has certified a HDDE below the 0.20 g/bhp-hr NOx

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<sup>2</sup> Legacy engines must comply with MY 2024 GHG requirements.

<sup>3</sup> A "credit market" is heretofore unknown in the heavy-duty highway engine space.

standard to generate NOx credits. Despite manufacturers' awareness that stringent standards were being promulgated by CARB, and federally-mandated emissions reductions were looming – conditions which normally motivate manufacturers to build a bank of credits to enable a more streamlined compliance pathway under those future standards – not a single manufacturer has taken that risk.<sup>4</sup> Accordingly, it is highly unlikely that manufacturers will be able to identify a technical pathway to work with current, verified hardware configurations to build a bank of credits starting in 2023, with essentially no lead time.

For all the foregoing reasons, the proposed series of restrictive methods available for legacy engine emissions-recovery (ZEV credit generation, ZEV credit purchase, and NOx credit generation on the US10 platform) do not provide manufacturers with the certainty they require to launch a legacy engine plan to continue to serve the California market. Simply put, without certainty, there can be no legacy engine launch plan, because there is not a complete business case for a manufacturer to evaluate. That leaves only the final step in the series of emission-recovery methods — an EO-approved mitigation plan — to provide the necessary certainty. As currently proposed, however, the requisite certainty is not assured through the “last-stop” mitigation plan, since it is impractical to sell a product with no view of the total cost to bring it to market. The only way the flexibility provisions (proposed to avoid the troubling consequences of unserved markets) can be workable is if CARB includes procedures to approve manufacturers' mitigation plans *prior* to the date by which market pricing for legacy engines must be set.

As currently proposed, the uncertainty inherent with the flexibility provisions appears to result in conditions that resemble punitive actions. Manufacturers who will have exhausted all possibilities to deliver on the emissions-recovery requirements for legacy engines will enter a phase of wide-open negotiations with the Executive Officer. (Simply making up the deficit in MY 2026 imposes a 25% premium on the deficit.)

It is important to note that the flexibility provisions could, and should, be framed up to ensure that all stakeholders can achieve positive outcomes. Those stakeholders include the customers that will see product availability in what might otherwise be unserved markets, manufacturers that can streamline a pathway to compliance even in the face of minimal lead time, and also CARB, which can have a means to avert the undesirable outcomes stemming from overly aggressive regulatory demands. To ensure these positive outcomes are realized, the flexibility provisions should be finalized to foster a cooperative effort to provide engines to vital market segments otherwise left unserved. The only way to do that is to provide that manufacturers' mitigation plans will be approved *in advance*.

In light of these concerns, EMA recommends that CARB modify §1956.8(a)(2)(C)3.b.iii.3.B to read, “*The manufacturer may submit contingency plans to be approved in advance under the provisions set forth in this subsection*”, or, preferably, “*Contingency plans may be submitted for approval in advance.*”

Beyond the need for CARB to finalize a functional program as recommended above, EMA has some additional concerns regarding various details of the new flexibility provisions. For example, the introductory text at §1956.8(a)(2)(C)3 provides that a manufacturer may certify

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<sup>4</sup> A clear sign that even the US10 standards pose a significant compliance challenge more than 10 years after launch.

legacy engine families “with  $0.100 < \text{FTP NO}_x \text{ FEL} \leq 0.20 \text{ g/bhp-hr}$ , and  $0.005 < \text{FTP PM FEL} \leq 0.01 \text{ g/bhp-hr}$ ...” As written, a manufacturer is precluded from certifying a legacy engine at a PM level of 0.005 g/bhp hr, a level for which PM offset credits would not be necessary. Similarly, manufacturers are precluded from certifying a legacy engine to a NO<sub>x</sub> level less than 0.100 g/bhp-hr. The provisions are unnecessarily restrictive. EMA recommends that CARB remove the lower-level limits to the allowable FELs for legacy engines.

In a related manner, the legacy engines are subject to 2023 model year requirements (save for GHG requirements). Yet, the FELs as expressed in the introductory text, are specified to three significant digits. As stated earlier, CARB should eliminate these lower-level limits. If CARB nonetheless decides to retain them, or changes them, EMA recommends that CARB specify the NO<sub>x</sub> FELs to two significant digits, consistent with the MY 2023 standards and FEL provisions.

Also related to the flexibility provisions, §1956.8(a)(2)(C)3.a. details the various regulatory programs for which model year 2023 requirements (in lieu of the 2024 model year requirements) will be applicable to legacy engines. For the flexibility provisions to be workable, however, CARB should also specify in §1956.8(a)(2)(C)3.a. the model year 2023 requirements applicable for the following regulatory programs and provisions as well:

- §86.010-38: Fuel requirements
- §86.1370 (Cal) B.7.: New in-use idling compliance test should not apply
- Diesel Test Procedures Subpart T: Manufacturer-run In-Use Testing
- §13 CCR 2140: Heavy-Duty In-Use Compliance Testing

EMA cannot guarantee that the list above covers all additional applicable references to MY 2023 requirements. CARB should add these and any other relevant exceptions following a thorough review. A more straightforward approach would be to apply a regulatory structure such as that used in §1956.8(a)(2)(C)2. related to engines  $\geq 525\text{HP}$  to these flexibility provisions.

Additionally, the HD OBD exemptions for legacy engines set forth at §1956.8(a)(2)(C)3.a.iv. also should be documented in 13 CCR §1971.1 and §1971.5. Any exceptions to the OBD provisions should be clearly stated, or, at minimum, referenced, in the OBD regulation. This will ensure that all of the applicable HD OBD certification and enforcement requirements are considered and applied appropriately to legacy engine families.

Another issue related to the new flexibility provisions concerns the limitations imposed by §1956.8(a)(2)(C)3.b.v., which reads, “*NO<sub>x</sub> and PM deficits generated by legacy engines are subject to the provisions of §86.004-15.A.(b)(5) of the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles,” as incorporated by reference in title 13, CCR, Section 1956.8(b).*” The referenced §86.004-15.A.(b)(5), reads as follows:

*Compliance under averaging, banking, and trading will be determined at the end of the model year. Engine families without an adequate amount of NO<sub>x</sub>. [sic] NO<sub>x</sub> plus NMHC, and/or particulate emission credits will violate the conditions of the certificate of conformity. The certificates of*

*conformity may be voided ab initio for engine families exceeding the emission standard.*

§86.004-15.A.(b)(5) is in conflict with §1956.8(a)(2)(C)3.b.iii.2, which permits credit deficits (under the circumstances described) to be carried into the 2026 model year: *“If credits from the same averaging set are not available, the manufacturer may carryover the NOx or PM deficit balance generated by legacy engines until the end of the 2026 model year.”* Similarly, carrying any legacy engine credit deficits from MY 2024 into MY 2025 appears to be in conflict with §1956.8(a)(2)(C)3.b.v. EMA recommends that the provision be modified to include the underlined text here:

*“NOx and PM deficits generated by legacy engines are subject to the provisions of §86.004-15.A.(b)(5) of the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles,” as incorporated by reference in title 13, CCR, Section 1956.8(b), except where legacy engine deficits from model years 2024 and 2025 are carried over into model years 2025 and 2026 per the provisions of this section §1956.8(a)(2)(C)3.”*

Modifying the text in this way will address this apparent conflict, and will bring clarity to the flexibility provisions.

The proposed flexibility provisions are also included in the Diesel Test Procedures at 86.xxx-11.5.3.5. EMA recommends to apply the same revisions proposed above to those provisions.

### **EMA’s Comments Related to Diesel Test Procedures**

**86.xxx-15.B.3.i.1.G.** establishes a maximum allowable PM FEL (“FEL cap”) of 0.010 g/bhp-hr for MY 2024 and later engine families. The PM FEL cap for legacy engines, however, should be specified to the same number of significant digits as the PM standard applicable to MY 2023 engines. EMA recommends that CARB apply the same approach they are proposing for the NOx FEL caps under 86.xxx-15.B.3.i.1.B and C, as shown here:

*(B) For 2024 through 2025 model years, the maximum FTP NOx FEL value is 0.20 g/bhp-hr for engines certified under title 13, CCR, Section 1956.8(a)(2)(C)3. For all other 2024 through 2025 model year engines, the maximum FTP NOx FEL value is 0.100 g/bhp-hr.*

*(C) For 2026 model years, the maximum FTP NOx FEL value is 0.100 g/bhp-hr.*

Accordingly, EMA recommends the PM FEL cap be written as follows:

*(G) For 2024 through 2025 model years, the maximum FTP particulate matter FEL value is 0.01 g/bhp-hr for engines certified under title 13, CCR,*

*Section 1956.8(a)(2)(C)3. For all other 2024 through 2025 model year engines, the maximum FTP particulate matter FEL value is 0.010 g/bhp-hr.*

*(H) For 2026 and subsequent model years, the maximum FTP particulate matter FEL value is 0.010 g/bhp-hr.*

**§86.xxx-15.B.4.(b):** EMA supports the availability of credit multipliers for engine families certified to future standards. In the 15-Day Change Notice, CARB proposes to limit the eligibility for credit multipliers to families certified at or below the standards of the future model year.

CARB's Omnibus Low NO<sub>x</sub> standards are extremely challenging, and include a number of new and progressively more demanding requirements at each of the three primary regulation stages, MYs 2024, 2027, and 2031. Credit multipliers serve as an important incentive to certify early to any of those regulation stages. The challenge is more than that of certifying to lower emissions standards; it also involves committing to more challenging in-use standards, and to longer Useful Life and Warranty periods, among other increasingly demanding requirements. Engine families should be eligible for credit multipliers whenever a manufacturer commits to the multi-faceted demands of future requirements, even if the family is certified at a level somewhat higher than the numeric standards of that future model year. For this reason, EMA recommends that CARB revise the eligibility for credit multipliers to include engine families certified up to the level of the maximum allowable NO<sub>x</sub> FEL ("FEL cap") for the future model year. For example, a MY 2025 MHDDE family certified to meet all the requirements of MY 2027 MHDDEs at a NO<sub>x</sub> FEL up to 0.050 g/bhp-hr should be eligible for a NO<sub>x</sub> credit multiplier of 1.5 as provided for in the table of §86.xxx-15.B.4.(d).

**§86.1370.B.6.3.3.** requires that for MY 2024 through 2046 engines the average engine power over an in-use test *must* be  $\geq 10\%$  of the engine's peak power for a valid test, and that a manufacturer should test additional days until a valid test is achieved:

*For 2024 through 2026 model year engines only, the average engine power over the test must be equal to or greater than 10% of the engine's peak power for a valid test. In the event of an invalid test, the manufacturer shall retest the vehicle additional days until a valid test is achieved.*

EMA recommends that manufacturers be given the option to submit data from an in-use test if the 10% minimum average power threshold is not met, and to count the vehicle toward the requirements to satisfy the in-use test order. The invalidation of a test day where the average power is  $< 10\%$  is a provision that was included to give manufacturers three model years of experience under the new 3B-MAW requirements before being liable for compliance at such very low average power levels. The  $< 10\%$  average power exclusion sunsets with MY2027. There is no harm, and, in fact, there is an environmental benefit demonstrated if a manufacturer is compliant even at low average power levels. This modification would also reduce the number of occasions where manufacturers would face the burden and inconvenience of adding additional test days, which also has damaging effects on the relationship with the fleet that has voluntarily cooperated

with the manufacturer to accept the inconvenience of in-use testing with their property, and on their premises. EMA therefore recommends that manufacturers be permitted to count a test having <10% average power over the test day toward the obligations under an In-Use test order should they so choose.

Also related to the provisions of §86.1370.B.6.3.3., EMA further recommends that a manufacturer be permitted to select another test vehicle, or even another fleet, if, following a second day of testing, the 10% threshold is not met (and the manufacturer elects *not* to submit the data as tested.) The average power criteria could overlap with and be further confounded by the minimum window count criteria of §86.1370.B.6.2. The revisions EMA recommends will permit manufacturers to avoid testing multiple days to no avail if the selected fleet's operations do not typically meet the average power criteria.

**§86.1910.A.(g)(ii):** CARB proposes to remove the redundant language related to minimum window count requirements per bin. EMA supports elimination of this redundant language, but recommends that the sentence from the proposed deleted section that reads, “*Evaluate the data combined from the day(s) of testing as described in section 86.1370.B.6.*”, be added to the retained provisions of §86.1910.A.(g) to make it clear that manufacturers should use the *combined* windows accumulated over multiple test days to demonstrate compliance to the minimum window count requirement (and to include the multiple-days’ test data). Note that the reference to §86.1370.B.6 does not provide the needed clarity, as those provisions at §86.1370.B.6.3.2 are equally ambiguous, and should be similarly modified as well.

### **EMA’s Comments Related to Otto-Cycle Test Procedures**

**86.xxx-15.B.3:** Eligibility for credit multipliers for families certified to future model year requirements is proposed to be limited to those families certified at or below the future standard. For the reasons described above related to the Diesel Test Procedures provisions of §86.xxx-15.B.4.(b), EMA recommends that engine families be eligible for credit multipliers if certified up to the level of the maximum NO<sub>x</sub> FEL level (“FEL cap”) of the future model year.

### **EMA’s Comments Related to Greenhouse Gas Provisions**

The Omnibus Low-NO<sub>x</sub> Regulations include proposed modifications to the Greenhouse Gas Test Procedures and to the Diesel Test Procedures, and the Otto-Cycle Test Procedures (Appendices B-3, B-1 and B-2 of the 30-Day and 15-Day changes.) The proposed modifications are closely aligned with the final EPA Technical Amendment package. See 86 FR 34308-34590 (June 29, 2021).

We appreciate and fully support CARB’s efforts to maintain alignment with the EPA Technical Amendment package. Further to that effort we have identified several areas of non-alignment and request that CARB adopt all EPA technical amendments as described in the final EPA Technical Amendment package. We would like to highlight the following provisions that are not aligned with EPA:



**§1036.150(q) and §1036.235(c):** CARB should align with the final EPA Technical Amendment package for these provisions related to fuel map confirmatory test procedures.

**§1036.230(f):** CARB should align with EPA's provision to allow engine families to be divided into subfamilies with respect to compliance with CO<sub>2</sub> standards, as amended in the final EPA Technical Amendment package.

**§1036.701(j):** CARB should allow for carry-over of Phase 1 vocational engine credits when recalculated against the revised Phase 2 baseline, in alignment with the final EPA Technical Amendment package.

**§1037.501(i):** CARB should align with EPA's provisions related to declared GEM inputs and compliance margins.

**§1037.660:** CARB should align with EPA's provisions related to partial credits for neutral-at-idle technology and should include the additional stop-start overrides, in alignment with EPA.

EMA appreciates the opportunity to provide the foregoing comments for CARB's consideration. If you have any questions, or if there is any additional information we could provide, please do not hesitate to contact Steve Berry at [sberry@emamail.org](mailto:sberry@emamail.org).

Respectfully submitted,

TRUCK & ENGINE MANUFACTURERS  
ASSOCIATION