State of California
Air Resources Board

Second Notice of Public Availability of Modified Text and Availability of Additional Documents

Proposed Amendments to the Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments:

**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**

Public Hearing Date: August 27, 2020
First Public Availability Date: May 5, 2021 – June 4, 2021
Second Public Availability Date: June 18, 2021
Deadline for Public Comment: July 6, 2021

At its August 27, 2020, public hearing, the California Air Resources Board (CARB or Board) approved for adoption proposed amendments to sections 1900, 1956.8, 1961.2, 1965, 1968.2, 1971.1, 2035, 2036, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2121, 2123, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2133, 2137, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2166, 2166.1, 2167, 2168, 2169, 2170, 2423, and 2485 of the California Code of Regulations (CCR), title 13; sections 95662 and 95663, CCR, title 17; and proposed adoption of sections: 2139.5, 2169.1, 2169.2, 2169.3, 2169.4, 2169.5, 2169.6, 2169.7, and 2169.8, CCR, title 13, which primarily: establish exhaust emission standards and associated test procedures for 2024 and subsequent model year (MY) heavy-duty engines and vehicles, amend on-board diagnostic (OBD) system requirements, amend the heavy-duty in-use testing program, amend the emissions warranty period and useful life requirements, amend the emissions warranty information and reporting requirements and corrective action procedures, establish in-use emissions data reporting requirements, amend portions of California's Phase 2 Heavy-Duty Greenhouse Gas

(GHG) regulations, and establish powertrain test procedures for heavy-duty hybrid vehicles.

At the hearing, CARB staff presented, and the Board approved for adoption, the proposed amendments, as initially released with the Notice of Public Hearing for this rulemaking action, along with additional proposed amendments that CARB staff had developed in response to comments received since the time that the 60-Day Notice of Public Hearing was posted on June 23, 2020.[1] In addition, in response to oral and written comments presented at the hearing, the Board recommended and directed CARB staff to develop additional modifications to the initially proposed regulatory language.

The Board directed the Executive Officer to make the modified regulatory language, and any additional conforming modifications, available for public comment, with any additional supporting documents and information, for a period of at least 15 days as required by Government Code section 11346.8. The Board further directed the Executive Officer to consider written comments submitted during the public review period and make any further modifications that are appropriate available for public comment for at least 15 days, and present the regulation to the Board for further consideration if warranted, or take final action to adopt the regulation after addressing all appropriate modifications.

The resolution and all other regulatory documents for this rulemaking are available online at the following CARB website:

https://ww2.arb.ca.gov/rulemaking/2020/hdomnibuslownox

CARB staff proposed modifications and those directed by the Board at the hearing were made available in the first Notice of Public Availability of Modified Text and Availability of Additional Documents for a 30-day public comment period from May 5, 2021, through June 4, 2021.

This second notice makes available additional proposed modifications for a 15-day public comment period. These amendments are intended to provide additional flexibilities for a set of engines for which market availability may be limited in early years. As set out in more detail below, the flexibilities ensure continued availability, while providing mechanisms to avoid any air pollution impacts, primarily by channeling further compensatory investments towards zero emission vehicles. The text of the modified regulatory language for section 1956.8 of title 13, CCR is shown in Appendix A-1, and the text of the modified regulatory language for the test procedures incorporated in the regulations by reference is shown in Appendices B-1 and B-2. No changes have been made to Appendices A-2, B-3, B-4, B-5, and B-6 and

[1] Resolution 20-23: Attachment A: Staff's Suggested Modifications to the Original Proposal, September 29, 2020. (https://ww3.arb.ca.gov/regact/2020/hdomnibuslownox/res20-23atta.pdf - accessed 3/22/2021)

therefore, they are not included in this 15-day notice of proposed changes. In addition, CARB staff has also added to the rulemaking record additional references to serve as an addendum to the Staff Report released on June 23, 2020.

The originally proposed regulatory language that was made available with the 60-day notice of proposed rulemaking on June 23, 2020 is shown in ~~strikethrough~~ to indicate deletions and underline to indicate additions. New deletions and additions to the originally proposed language that were made public with the first 30-day notice are shown in ~~double strikethrough~~ and double underline format, respectively. New additions and deletions to the proposed language that are made public with this notice are shown in ***bold italic double underline*** and ~~***bold italic double strikeout***~~, respectively.

In the Final Statement of Reasons, CARB staff will respond to all comments received on the record during the comment periods. The Administrative Procedure Act requires that CARB staff respond to comments received regarding all noticed changes. Therefore, CARB staff will only address comments received during this 15-day comment period that are responsive to this notice, documents added to the record, or the changes detailed in the attachments.

Summary of Proposed Modifications

The following summary does not include all modifications to correct typographical or grammatical errors, changes in numbering or formatting, nor does it include all of the non-substantive revisions made to improve clarity and readability.

I. Proposed Modifications to Title 13, CCR (Appendix A-1)

A. Proposed Modifications to Section 1956.8, Title 13, CCR Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles, 2021 and Subsequent Zero-Emission Powertrains, and 2022 and Subsequent Model Heavy-Duty Hybrid Powertrains

1. Subsection 1956.8(a)(2)(C)3

a. To ease the transition to the new lower oxides of nitrogen (NOx) standards, which first take effect with the 2024 model year, and will be more stringent than the currently applicable California and federal standards, for the first two model years (2024 and 2025) of the new standards CARB staff proposes to add flexibilities that allow manufacturers to certify engines to the current exhaust standards for NOx and particulate matter (PM), in exchange for purchasing and retiring heavy-duty zero-emission powertrain (ZEP) credits sufficient to address any additional pollution impacts. CARB staff proposes to provide this flexibility, provided that a manufacturer offsets any NOx or PM credit deficits generated from this option by using credits from heavy-

duty ZEPs (i.e., from the zero-emission averaging set). If a sufficient number of credits from the zero-emission averaging set are not available at the cost thresholds described in the regulation, a manufacturer may submit a request to use other credits to CARB's Executive Officer. CARB staff's proposed change is intended to avoid any market disruption as manufacturers adjust to the omnibus standards, as well as to support the state's transition to heavy-duty zero emission vehicles (ZEVs). CARB has carefully analyzed these options, and believes they will wholly address any supply needs during this period. However, CARB staff will continue to monitor market conditions and credit availability, and will stay engaged with all stakeholders. CARB staff will inform the Executive Office and Board in writing, and will inform the public well before critical model years, if further action is needed. The proposed requirements to certify these legacy engines are further described in subsections a. and b.

b. In subsection a, legacy engines must otherwise meet all applicable 2024 or 2025 model year requirements, including applicable Phase 2 greenhouse gas standards described in 13 CCR 1956.8, with the following allowances in subsections a.i through a.iv.

c. In subsection a.i, the legacy engine family is not subject to the low load cycle emissions standards.

d. In subsection a.ii, the legacy engine family only needs to meet the existing Not-to-Exceed requirements, instead of meeting the new 3-bin moving average window (3B-MAW) requirements.

e. In subsection a.iii, the legacy engine family only needs to meet the durability demonstration requirements for a 2023 model year engine family.

f. In subsection a.iv, the legacy engine family only needs to meet the heavy-duty on-board diagnostic system (HD OBD) requirements applicable to a 2023 model year engine family.

g. In subsection b., additional criteria for legacy engine certification is described.

h. Under subsection b.i, certifying engine manufacturers are required to participate in the California averaging, banking, and trading (CA-ABT) program as described in section §86.xxx-15.B.3 of the diesel test procedures.

i. In subsection b.ii, the maximum family emission limits for the legacy engines are required to meet the values specified in §86.xxx-15.B.3.(i) of the diesel test procedures.

j. In subsection b.iii, the NOx and PM deficits created by legacy engine families are required to be offset by credits from the zero-emission averaging set.

k. In subsection b.iii.1, a new compliance pathway is provided if zero-emission NOx or PM credits are not available, or if the cost to obtain such credits in the marketplace is excessive. In order to establish the price cap for zero-emission NOx credits, a $4,000 per medium heavy-duty legacy engine cost was chosen because it represents a significant portion of the expected cost of a new engine (i.e., about 20 percent of the cost of a 2021 model year medium heavy-duty engine ($20,000). Under this provision, the manufacturer may use credits from the combustion engine averaging sets if it submits specified information to, and obtains approval from CARB's Executive Officer.

l. In subsection b.iii.2, additional flexibility is provided if the manufacturer is unable to find credits from the combustion engine averaging set. Under this scenario, the manufacturer can carry over its NOx and PM deficit balance until the end of 2026 model year and offset the deficits using 1.25 times the required deficits. The required credits can come from either the zero-emission averaging set or the same combustion engine averaging set.

m. In subsection b.iii.3, if the manufacturer fails to offset the credits by the end of 2026 model year, then provisions in b.iii.3.A through C would apply.

n. In subsection b.iii.3.A, manufacturers are required to provide documentation showing that they were unable to procure the required credits.

o. In subsection b.iii.3.B, manufacturers may submit a plan to the CARB Executive Officer which would both offset the deficits within five years and additionally primarily ensure such reductions would benefit disadvantaged communities. The plan would be subject to Executive Officer approval.

p. In subsection b.iii.3.C, the consequences of not meeting the objectives of the plan after the 5-year period is identified.

q. In subsection b.iv, the number of legacy engine sales in California would be limited to 45 percent of the total actual heavy-duty diesel engine sales in California in 2024 model year, and 25 percent of the total actual California heavy-duty diesel sales in 2025 model year. For example, a certifying engine manufacturer that sells a total of 100 heavy-duty diesel engines in California in the 2024 model year would be allowed to sell 45 legacy engines (45/100=45 percent) for that model year in California, as long as it offsets the emission increase using credits as described above. The temporary ability to sell legacy engines during the first few years of the omnibus standards is being proposed as a flexibility provision to ease transition to the

new standards, and CARB staff proposes these declining percent limits to ensure manufacturers are transitioning to omnibus compliant engines.

r. In subsection b.v, the consequence of not meeting the proposed compliance options for legacy engines are aligned with the corresponding federal provisions specifying consequences for engine families that do not demonstrate compliance with averaging, banking, and trading programs.

s. In subsection b.vi, the proposed amendment clarifies that a manufacturer may only certify a legacy engine if it also certifies one or more engine families to the NOx and PM standards applicable to 2024 through 2026 model year heavy-duty diesel engines in 13, CCR, Section 1956.8(a)(2)(C)1.

2. Subsection 1956.8(a)(6)(C)

For legacy engines certified to the provisions in title 13, CCR Section 1956.8(a)(2)(C)3, the optional idling emission standard of 30 grams of NOx per hour (g/hr) can be met in lieu of the engine shutdown system requirements. This modification is needed to specify the NOx idling standards for legacy engines.

3. Subsection 1956.8(j)

In the definitions section, a new definition was added to identify that a legacy engine family is an engine family certified under title 13, CCR Section 1956.8(a)(2)(C)3. A number of other definitions were renumbered as a consequence of this new definition.

B. Proposed Modifications to Title 13, CCR, Section 2112

1. Subsection 2112 (l)(22)(A) and (D)

In the first 30-day notice, CARB staff proposed to change the applicability of the 15-year/150,000-mile useful life period for medium-duty engines to begin in the 2024 model year rather than the originally proposed 2023 model year. This allows for better alignment with other proposed regulatory changes and product development timelines. CARB staff inadvertently neglected to change the start date from 2023 to 2024 for the Otto-cycle engines in 13 CCR 2112 (l)(22)(A) and (D). The proposed changes correct this error.

II. Proposed Modifications to California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles (Appendix B-1)

The following sections discuss CARB staff's proposed modifications to the California Exhaust Emissions Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Engines and Vehicles.

A. Part 86, Subpart A – General Provisions for Heavy-Duty Engines and Heavy-Duty Vehicles

1. Section 2. Definitions. [§86.xxx-2]

a. In the 30-Day Notice, CARB staff proposed to add definitions for the terms "automatic active regeneration" and "manual active regeneration" to clarify the two types of operation to use the provisions provided in 86.1370. However, CARB staff inadvertently added two definitions for "manual active regeneration", one of which was retained from a previous definition. CARB staff proposes to correct this error by removing the previous erroneous definition.

b. CARB staff is proposing to add a new definition for the term "legacy engine family". The term refers to an engine family certified under the provisions of title 13, CCR, Section 1956.8(a)(2)(C)3.

c. In the 30-Day Notice, CARB staff proposed to add a definition for the term "telematics" to clarify the new requirements for certifying engine and vehicle manufacturers that rely on the technology to submit in-use emission data reports. The proposed definition stated that telematics means any wireless technology that collects and transmits engine or vehicle operational parameters. However, telematics is associated with wireless data transmission and not with data collection. CARB staff is proposing to rectify this error by defining telematics as any wireless technology that transmits engine or vehicle operational parameters.

2. Section 11. Emission standards for diesel heavy-duty engines and vehicles. [§86.xxx-11]

a. In newly added subsection 11.B.5.3.5, to ease the transition to the new lower NOx standards, which first take effect with the 2024 model year, and which will be more stringent than the currently applicable California and federal standards, for the first two model years (2024 and 2025) of the new standards, CARB staff proposes to add flexibilities that allow manufacturers to certify engines to the current exhaust standards for NOx and particulate matter (PM), in exchange for purchasing and retiring heavy-duty zero-emission powertrain (ZEP) credits sufficient to address any additional

pollution impacts. CARB staff proposes to provide this flexibility, provided that the manufacturer offsets any NOx or PM credit deficits generated from this option by using credits from heavy-duty ZEPs (i.e., from the zero-emission averaging set). If a sufficient number of credits from the zero-emission averaging set are not available at the cost thresholds described in the regulation, a manufacturer may submit a request to use other credits to CARB's Executive Officer. CARB staff's proposed change is intended to avoid any market disruption as manufacturers adjust to the omnibus standards, as well as to support the state's transition to heavy-duty ZEVs. CARB staff has carefully analyzed these options, and believe they will wholly address any supply needs during this period. However, CARB staff will continue to monitor market conditions and credit availability, and will stay engaged with all stakeholders. CARB staff will inform the Executive Office and Board in writing, and inform the public, well before critical model years, if further action is needed. The requirements to certify these legacy engines are further described in subsections 11.B.5.3.5.1 and 11.B.5.3.5.2.

b. In subsection 11.B.5.3.5.1, legacy engines must otherwise meet all applicable 2024 or 2025 model year requirements, including applicable Phase 2 greenhouse gas standards described in 13 CCR 1956.8, with the following allowances in subsection (a) through (d).

c. In subsection 11.B.5.3.5.1(a), the legacy engine family is not subject to the low load cycle emissions standards.

d. Under subsection 11.B.5.3.5.1(b), the legacy engine family only needs to meet the Not-to-Exceed requirements instead of meeting the new 3 bin moving average window (3B-MAW) requirements.

e. Under subsection 11.B.5.3.5.1(c), the legacy engine family only needs to meet the durability demonstration requirements for a 2023 model year engine family.

f. In subsection 11.B.5.3.5.1(d), the legacy engine family only needs to meet the heavy-duty on-board diagnostic system (HD OBD) requirements applicable to a 2023 model year engine family.

g. In subsection 11.B.5.3.5.2, additional criteria for legacy engine certification is described.

h. In subsection 11.B.5.3.5.2(a), certifying engine manufacturers would be required to participate in the CA-ABT program as described in section 15.B.3.

i. In subsection 11.B.5.3.5.2(b), the maximum family emission limits for the legacy engines are required to meet the values specified in 15.B.3.(i).

j. In subsection 11.B.5.3.5.2(c), the NOx and PM deficits created by legacy engine families are required to be offset by credits from the zero-emission averaging set.

k. In subsection 11.B.5.3.5.2(c)(1), a new compliance pathway is provided if zero-emission NOx or PM credits are not available or if the cost to obtain those credits in the marketplace is excessive. In order to establish the price cap for zero-emission NOx credits, a $4,000 per medium heavy-duty legacy engine cost was chosen because it represents a significant portion of the expected cost of a new 2021 model year medium heavy-duty engine ($20,000).

   Under this provision, the manufacturer may use credits from the combustion engine averaging sets if it submits specified information to, and obtains approval from CARB's Executive Officer.

l. In subsection 11.B.5.3.5.2(c)(2), additional flexibility is provided if the manufacturer is unable to find credits from the combustion engine averaging set. Under this scenario, the manufacturer can carryover its NOx and PM deficit balance until the end of 2026 model year and offset the deficits with using 1.25 times the required deficits. The required credits can come from either the zero-emission averaging set or the same combustion engine averaging set.

m. In subsection 11.B.5.3.5.2(c)(3), if the manufacturer fails to offset the credits by the end of 2026 model year, then provisions in 11.B.5.3.5.2(c)(3)(i) through (iii) would apply.

n. In subsection 11.B.5.3.5.2(c)(3)(i), manufacturers are required to provide documentation showing that they were unable to procure the required credits.

o. In subsection 11.B.5.3.5.2(c)(3)(ii), a manufacturer may submit a plan to the CARB Executive Officer which would offset the deficits within five years and additionally primarily ensure such reductions would benefit disadvantaged communities. The plan would be subject to Executive Officer approval.

p. In subsection 11.B.5.3.5.2(c)(3)(iii), the consequences of not meeting the objectives of the plan after the 5-year period is identified

q. In subsection 11.B.5.3.5.2(d), for each manufacturer, the number of legacy engine sales in California would be limited to 45 percent of the total actual heavy-duty diesel engine sales in California in 2024 model year, and 25 percent of the total actual California heavy-duty diesel sales in 2025 model year. For example, a certifying engine manufacturer that sells a total of 100 heavy-duty diesel engines in California in the 2024 model year would be allowed to sell 45 legacy engines (45/100=45 percent) for that model year in

California, as long as it offsets the emission increase using credits as described above. The temporary ability to sell legacy engines during the first few years of the omnibus standards is being proposed as a flexibility provision to ease transition to the new standards, and CARB staff proposes these declining percent limits to ensure manufacturers are transitioning to omnibus compliant engines.

r. In subsection 11.B.5.3.5.2(e), the consequence of not meeting the proposed compliance options for legacy engines are aligned with the corresponding federal provisions specifying consequences for engine families that do not demonstrate compliance with averaging, banking, and trading programs.

s. In subsection 11.B.5.3.5.2(f), the proposed amendment clarifies that a manufacturer may only certify a legacy engine if it also certifies one or more engine families to the NOx and PM standards applicable to 2024 through 2026 model year heavy-duty diesel engines in title 13, CCR, Section 1956.8(a)(2)(C)1.

t. In subsection 11.B.6.3.1.1, the optional idling emission standard of 30 g of NOx/hr can be met in lieu of the engine shutdown system requirements for legacy engines certified to the provisions in title 13, CCR, Section 1956.8(a)(2)(C)3. This modification is needed to specify the NOx idling standards for legacy engines.

3. Section 15. NOx plus Non-Methane Hydrocarbons (NMHC) and particulate averaging, trading, and banking for heavy-duty engines. [§86.xxx-15]

In subsection 15.B of this test procedure, CARB staff proposes to modify the following elements of the CA-ABT program:

a. In subsection 15.B.3, the certification requirements for zero-emission powertrains is moved to 15.B.3.(j).

b. In subsection 15.B.3.(a)(4), the heavy-duty zero-emission averaging set was modified to allow the certified zero-emission powertrains to generate PM credits in addition to NOx credits. This would provide additional flexibility to manufacturers to use the zero-emission credits.

c. In subsection 15.B.3.(b), references for NOx only credits were removed as zero-emission powertrains can now generate NOx and PM credits. Also, additional flexibility is provided so that manufacturers can use heavy-duty zero-emission credits to offset any engine family that is generating a deficit.

d. In subsection 15.B.3.(g), additional language was added to clarify the definition of the current model year standard.

e. In subsection 15.B.3.(i)(1)(B) through 15.B.3.(i)(1)(C), the FTP NOx FEL values were modified to 0.20 g/bhp-hr to allow the sale of legacy engines as defined in subsection 11.B.5.3.5 for the 2024 and 2025 model years. The previous FTP NOx FEL caps for non-legacy engines were not modified and kept at 0.100 g/bhp-hr for the 2024 through 2026 model years.

f. In subsection 15.B.3.(i)(1)(D), the 0.050 g/bhp-hr FTP NOx FEL cap was limited to light heavy-duty and medium-heavy-duty engines for 2027 and subsequent model years. This was needed so that a similar adjustment could be made for heavy heavy-duty engines at FUL FEL cap.

g. In subsection 15.B.3.(i)(1)(E), the 2027 through 2030 model year FEL caps for heavy heavy-duty engines was increased to 0.065 g/bhp-hr. During the 30-day comment period, a comment was received questioning why the FEL cap was not adjusted appropriately for heavy heavy-duty engines. For light heavy-duty and medium heavy-duty engines, the difference (delta) between the full useful life standard and the FEL cap is 0.030 g/bhp-hr. CARB staff agreed that an appropriate FEL cap should have been made for heavy heavy-duty engines, similar to the cap provided to light heavy-duty and medium heavy-duty engines by setting a delta of 0.030 g/bhp-hr between the emission standard and the FEL cap.

h. In subsection 15.B.3.(i)(1)(F), the same FEL caps adjustments were made to 2031 and subsequent model year heavy heavy-duty engines and the FEL cap value was increased to 0.070 g/bhp-hr.

i. Subsection 15.B.3.(i)(1)(G) was renumbered. No changes were made to the content of the subsection.

j. In subsections 15.B.3.(j) through 15.B.3.(j)(3), the regulatory language was modified to allow zero-emission powertrains to generate PM credits in addition to NOx credits. PM credits would be needed to certify the legacy engines as defined in title 13, CCR, Section 1956.8(a)(2)(C)3. Additionally, the certification requirements for the zero-emission powertrain were moved to subsection 15.B.3.(j)(4).

k. In subsection 15.B.3.(j)(4), the California certification requirement for zero-emission powertrains was relaxed by only requiring an Executive Order for 2024 through 2026 model years. Given that the zero-emission powertrain certification program is new and only became effective with the 2021 model year, CARB staff is concerned that certified zero-emission powertrains may not be available for 2022 through 2023 model years. As such, the regulatory language was modified to only require that the zero-emission powertrain be certified under title 13, CCR, section 1956.8(a)(8) for 2024 through 2026 model years.

l. In subsection 15.B.4.(b), additional clarification was made by adding a specific example for demonstrating eligibility criteria for early compliance credit multipliers. During the 30-day comment period, a comment was received requesting additional clarification for demonstrating eligibility criteria. The example provided clarifies the necessary requirements.

4. Section 35. Labeling. [§86.xxx-35]

In subsection 35.B.8, a new labeling format was added. The new format would be used to identify legacy engines produced in 2024 and 2025 model years as described in title 13, CCR, Section 1956.8(a)(2)(C)3.

B. Part 86, Subpart N - Exhaust Test Procedures for Heavy-duty Engines

1. Section 86.1370. Not-To-Exceed test procedures.

In the 30-Day Notice, CARB staff proposed changes to 86.1370.B.6 Test Procedures for 3B-MAW Method for diesel engines. There was a typographical error of an extra "2" in the numbering of subsection 6.3.2. The extra "2" was deleted to fix the error.

C. Part 86, Subpart T- Manufacturer-Run In-Use Testing Program for Heavy-Duty Diesel Engines

1. Section 86.1910 - How must I prepare and test my in-use engines?

In the 30-Day Notice, CARB staff proposed changes to 86.1910 to provide instructions for testing and meeting minimum window requirements per bin for a valid test. Subsection A.6(ii) included redundant instructions already defined in 86.1370.B.6.3.2. CARB staff proposes to remove subsection A.6(ii).

2. Section 86.1912 - How do I determine whether an engine meets the vehicle-pass criteria?

In the 30-Day Notice, CARB staff proposed changes to 86.1910 to provide instructions for testing and meeting minimum window requirements per bin for a valid test. Subsection B.2 includes redundant instructions already defined in 86.1370.B.3.2. CARB staff proposes to remove the redundant subsection B.2.

III. Proposed Modifications to California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles (Appendix B-2)

The following sections discuss CARB staff's proposed modifications to the California Exhaust Emissions Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles.

1. Section 15. NOx and particulate averaging, trading, and banking for heavy-duty engines. [§86.xxx-15]

In subsection 15.B of this test procedure, CARB staff proposes to modify the following elements of the CA-ABT program:

a. In subsection 15.B.2, the certification requirements for zero-emission powertrains are moved to 15.B.2.(i).

b. In subsection 15.B.2.(a)(2), the heavy-duty zero-emission averaging set was modified to allow the certified zero-emission powertrains to generate NMHC credits in addition to NOx credits. This would provide additional flexibility to manufacturers to use the zero-emission credits.

c. In subsection 15.B.2.(b), references for NOx only credits were removed as zero-emission powertrains can now generate NOx and NMHC credits. Also, additional flexibility is provided so that manufacturers can use heavy-duty zero-emission credits to offset any engine family that is generating a deficit.

d. In subsection 15.B.2.(f), additional language was added to clarify the definition of the current model year standard.

e. In subsections 15.B.2.(i) through 15.B.2.(i)(3), the regulatory language was modified to allow zero-emission powertrains to generate NMHC credits in addition to NOx credits. Additionally, the certification requirements for the zero-emission powertrain was moved to subsection 15.B.2.(i)(4).

f. In subsection 15.B.2.(i)(4), the California certification requirement for zero-emission powertrains was relaxed by only requiring an Executive Order for 2024 through 2026 model years. Given that the zero-emission powertrain certification program is new and only became effective with the 2021 model year, CARB staff is concerned that certified zero-emission powertrains may not be available for 2022 through 2023 model years. As such, the regulatory language was modified to only require that the zero-emission powertrain be certified under title 13, CCR, section 1956.8(a)(8) for 2024 through 2026 model years.

g. In subsection 15.B.3.(b), additional clarification was made by adding a specific example for demonstrating eligibility criteria for early compliance credit multipliers. During the 30-day comment period, a comment was received requesting additional clarification for demonstrating eligibility criteria. The example provided clarifies the necessary requirements.

Additional Non-Substantive Modifications

In addition to the modifications described above, additional modifications correcting grammar, punctuation and spelling have been made throughout the proposed changes. These changes are non-substantive.

The modifications described throughout this Notice do not change implementation of the regulation in any way that affects the conclusions of the environmental analysis included in the Staff Report because the modifications consist primarily of revisions to provide more flexibility in complying with the new requirements added by this rulemaking (while still reducing emissions), and of clarifications and definitions that do not alter the compliance responses. This rulemaking would not create the potential for any new or more severe significant environmental impacts which were not previously examined. None of the modifications has the potential to increase emissions or otherwise cause any significant environmental impacts, as the proposed regulation would remain more stringent than under existing conditions. While one element of the modifications would allow for the limited distribution of engines that meet NOx and PM standards that are less stringent than the standards originally proposed in this rulemaking, the less stringent NOx and PM standards are currently already allowed under California's existing standards. Furthermore, all incremental emissions from such higher emitting engines (compared to the original 45-day regulatory proposal in this rulemaking) must be offset by the distribution of heavy-duty zero-emission vehicles, distribution of lower emitting heavy-duty diesel engines, or by performing projects in disadvantaged communities. The net effect of this element of the proposed modifications is to maintain a 0.050 g/bhp-hr NOx emission standard for the overall heavy-duty sector in 2024 through 2025 model years, thereby ensuring no overall emissions increases from this sector. This element of the proposed modifications would also have the effect of reducing the potential for businesses to buy more legacy engines now before the more stringent 2024 MY emission standards established by this rulemaking action become effective. This is because the use of currently-certifiable engines would be allowed (with new conditions) for a few additional years. The existing environmental analysis remains applicable to and adequate for the project. Therefore, no additional environmental analysis or recirculation of the analysis is required.

Additional Documents Added to the Record

In the interest of completeness and in accordance with Government Code section 11347.1, subdivision (a), CARB staff has also added to the rulemaking record and invites comments on the following additional documents:

1. (Abkenar, 2020) Abkenar, Gita Nematbakhsh, Jean-Paul Viricelle, Mathilde Rieu and Philippe Breuil. "Development of a Selective Mixed-Potential Ammonia Sensor for Automotive Exhausts," 2020 ECS Meeting Abstract MA2020-01 2163 https://doi.org/10.1149/MA2020-01282163mtgabs

2. (Abkenar, 2021) Abkenar, Gita Nematbakhsh, Mathilde Rieu, Philippe Breuil, Jean-Paul Viricelle."Development of a selective ammonia YSZ-based sensor and modeling of its response," Sensors and Actuators B: Chemical, Volume 338, 2021, 129833, ISSN 0925-4005, https://doi.org/10.1016/j.snb.2021.129833 (https://www.sciencedirect.com/science/article/pii/S0925400521004020)

3. (Brosha, 2016) Brosha, Eric L., Vitaly Y. Prikhodko, Cortney R. Kreller, Josh A. Pihl, Scott Curran, James E. Parks II, and R. Mukundan, "Response Characteristics of Stable Mixed-Potential NH3 Sensors in Diesel Engine Exhaust." Emission Control Science Technology, 2017. 3:112–121. DOI 10.1007/s40825-016-0050-2

4. (Cummins, 2018) "Cummins Product and Technology Unveil at the 2018 IAA Commercial Vehicles - Hanover, Germany" Sep 19.2018 https://www.youtube.com/watch?v=nJKaZ9FYnN0 - Accessed 6/4/2021

5. (Jacobs, 2021) "The Latest Developments in CDA Technology," https://www.jacobsvehiclesystems.com/blog/latest-developments-cda-technology - Accessed 5/17/2021

6. (Nieuwstadt, 2011) Nieuwstadt, M., and D. Upadhyay. "Control of Urea SCR Systems for US Diesel Applications," Oil & Gas Science and Technology - Revue d'IFP Energies nouvelles, Institut Français du Pétrole, 2011, 66 (4), pp.655-665. 10.2516/ogst/2011104. hal-01937425 https://hal.archives-ouvertes.fr/hal-01937425/document

7. (Peng, 2016) Peng, W.Y., Sur, R., Strand, C.L. et al. "High-sensitivity in situ QCLAS-based ammonia concentration sensor for high-temperature applications". Appl. Phys. B 122, 188 (2016). https://doi.org/10.1007/s00340-016-6464-2

8. (PERC, 2020a) Cummins 6.7L Dedicated Propane Engine Webinar (Audio only). Propane Council. May 28, 2020 https://resources.propane.com/cummins-inc-webinar-may-2020 - Accessed 6/4/2021

9. (PERC, 2020b) Cummins 6.7L Propane Engine: Webinar Questions. Propane Council. May 28, 2020 https://cdn2.hubspot.net/hubfs/3572053/Cummins6.7LPropaneEngineFAQs_052820-2.pdf - Accessed 6/4/2021

10. (PERC, 2020c) Cummins 6.7L Propane Engine: Webinar. PPT Presentation. Propane Council. May 28, 2020. https://cdn2.hubspot.net/hubfs/3572053/Cummins6.7LPropaneEngineWebinar_05282020-1.pdf - Accessed 6/4/2021

11. (Ramaiyan, 2017). Ramaiyan, Kannan P., Josh A. Pihl, Cortney R. Kreller, Vitaly Y. Prikhodko, Scott Curran, James E. Park II, Rangachary Mukundan, and Eric L. Brosha. "Response Characteristics of a Stable Mixed Potential Ammonia Sensor in Simulated Diesel Exhaust," Journal of The Electrochemical Society, 164 (9) B448-B455 (2017)

12. (Rao, 2020) Rao, S., Sarlashkar, J., Rengarajan, S., Sharp, C. et al., "A Controls Overview on Achieving Ultra-Low NOx," SAE Technical. Paper 2020-01-1404, 2020, doi:10.4271/2020-01-1404.

13. (Richesson, 2021) Richesson, Brian. "PERC signs contract with Cummins to advance engine project," LPGas. June 3, 2021 https://www.lpgasmagazine.com/perc-signs-contract-with-cummins-to-advance-engine-project/ - Accessed 6/4/2021

14. (Sakthivel, 2019) Sakthivel, Bhuvaneshwari and G. Nammalvar. "Selective ammonia sensor based on copper oxide/reduced graphene oxide nanocomposite," Journal of Alloys and Compounds, Volume 788, 2019, Pages 422-428, ISSN 0925-8388, https://doi.org/10.1016/j.jallcom.2019.02.245 (https://www.sciencedirect.com/science/article/pii/S0925838819307078)

Because of current travel, facility, and staffing restrictions, the California Air Resources Board's offices have limited public access. Please contact Chris Hopkins, Regulations Coordinator, at chris.hopkins@arb.ca.gov or (916) 445-9564 if you need a physical copy of the document. Pursuant to Government Code section 11347.1, upon request to the aforementioned Regulations Coordinator, the document would be available for inspection at the California Air Resources Board, 1001 I Street, Sacramento, California, 95814, between the hours of 9:00 .a.m. to 4:00 p.m., Monday through Friday (excluding holidays).

Agency Contacts

Inquiries concerning the substance of the proposed regulation may be directed to Daniel Hawelti, Staff Air Pollution Specialist, On-Road Heavy Duty Diesel Section, at (626) 450-6149 or (designated back-up contact) Paul Adnani, Staff Air Pollution Specialist, at (626) 459-4476.

Public Comments

Written comments will only be accepted on the modifications identified in this Notice. Comments may be submitted by postal mail or by electronic submittal no later than the due date to the following:

Postal mail: Clerks' Office, California Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: https://www.arb.ca.gov/lispub/comm/bclist.php

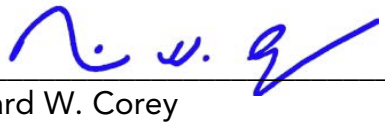
Please note that under the California Public Records Act (Gov. Code §6250 et seq.), your written and verbal comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

In order to be considered by the Executive Officer, comments must be directed to CARB in one of the two forms described above and received by CARB no later than the deadline date for public comment listed at the beginning of this notice. Only comments relating to the above-described modifications to the text of the regulations shall be considered by the Executive Officer.

If you need this document in an alternate format or another language, please contact the Clerks' Office at (916) 322-5594 or cotb@arb.ca.gov no later than five (5) business days from the release date of this notice. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Si necesita este documento en un formato alterno u otro idioma, por favor llame a la oficina del Secretario del Consejo de Recursos Atmosféricos al (916) 322-5594 o cotb@arb.ca.gov no menos de cinco (5) días laborales a partir de la fecha del lanzamiento de este aviso. Para el Servicio Telefónico de California para Personas con Problemas Auditivos, ó de teléfonos TDD pueden marcar al 711.

California Air Resources Board



Richard W. Corey
Executive Officer

Date: June 18, 2021

Attachments

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see CARB's website (www.ARB.ca.gov).