

DATE: August 21, 2019 Mail-Out #MSC 19-19

TO: All Interested Parties

SUBJECT: PUBLIC WORKSHOP TO DISCUSS REGULATORY CONCEPTS FOR THE HEAVY-DUTY "OMNIBUS" LOW NOX RULEMAKING

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The California Air Resources Board (CARB or Board) invites you to participate in a public workshop to discuss regulatory concepts to reduce oxides of nitrogen (NOx) emissions from new on-road heavy-duty vehicles greater than 10,000 pounds gross vehicle weight rating (GVWR). CARB staff's proposal would reduce emissions by comprehensively addressing heavy-duty engine certification and in-use testing requirements, including by lowering the emissions standards, better controlling emissions during cold start and at low loads, strengthening the durability demonstration procedures, lengthening warranty and useful life, and expanding the amount of engine operation subject to in-use testing requirements. CARB staff will also provide an update to the low-NOx demonstration projects currently in progress at Southwest Research Institute (SwRI).

The workshop will be held at the following location and time:

Date: Thursday, September 26, 2019  
Time: 9:00 a.m. to 1:00 p.m.  
Location: South Coast Air Quality Management District, Auditorium  
21865 Copley Drive  
Diamond Bar, California 91765

The workshop will be available via webcast for those unable to attend in person. The broadcast can be accessed on the day of the workshop at [South Coast AQMD Webcasts](#). During the workshop, participants may submit questions or comments by email at [lownox@arb.ca.gov](mailto:lownox@arb.ca.gov). CARB staff's presentation and any associated documents will be posted prior to the workshop on CARB's website at: [Heavy-Duty Low NOx](#).

## Background

Since 1990, NOx emission standards for on-road new heavy-duty engines have become more stringent, decreasing from 6.0 grams per brake horsepower hour (g/bhp-hr) in 1990 to the current 0.20 g/bhp-hr standard in 2010. In addition to the increasingly tighter new engine standards, California has also adopted programs that provide substantial in-use emissions reductions, such as vehicle idling restrictions, and in-use fleet rules such as the Drayage Truck Regulation and the Truck and Bus

Regulation. These fleet rules require the upgrade of older trucks and buses to newer, cleaner engines meeting the 2010 standards by 2023. To comply with these regulations, fleets have made substantial investments to purchase lower-emitting vehicles. However, despite all of these efforts, on-road heavy-duty vehicles are still a significant source of NO<sub>x</sub> emissions in the State, and are responsible for about 30 percent of total statewide NO<sub>x</sub> emissions, a precursor to ambient ozone and secondary particulate matter formation. In order to meet California's air quality goals, further reductions of heavy-duty NO<sub>x</sub> emissions are necessary.

In 2013, California established optional low-NO<sub>x</sub> standards<sup>1</sup> with the most aggressive standard being 0.02 g/bhp-hr, which is 90 percent below the current standard. The optional low-NO<sub>x</sub> standards were developed to pave the way for the more stringent mandatory standards by encouraging manufacturers to develop and certify low-NO<sub>x</sub> engines, and incentivizing potential customers to purchase these low-NO<sub>x</sub> engines. To date, a total of ten engines, some using natural gas and others using liquefied petroleum gas, have been certified to the optional NO<sub>x</sub> standards.

In March 2017, CARB approved the 2016 State Strategy for the State Implementation Plan (SIP).<sup>2</sup> One of the key measures in the SIP is the establishment of on-road heavy-duty engine low-NO<sub>x</sub> emission requirements that would provide a 90 percent reduction in NO<sub>x</sub> emissions compared to today's engines. To complement this measure, the SIP also included a "Lower In-Use Emission Performance Level" measure that would ensure that heavy-duty vehicles remain "clean" in-use, as they were originally certified when new. These two measures are critical for attaining federal health-based air quality standards for ozone in 2031 in the South Coast and San Joaquin Valley air basins, as well as PM<sub>2.5</sub> standards in the next decade.

Because heavy-duty vehicles that are newly purchased outside of California contribute significantly to the total heavy-duty vehicle miles traveled in California (i.e., approximately 60 percent of total heavy-duty vehicle miles traveled in the South Coast Air Basin on any given day are by such vehicles), it is critical that the U.S. EPA take action to establish a new national low-NO<sub>x</sub> standard for heavy-duty vehicles. In response to petitions for a low-NO<sub>x</sub> rulemaking from over 20 organizations, including state and local air agencies from across the country, on November 13, 2018, U.S. EPA announced the "Cleaner Trucks Initiative" to develop regulations to further reduce NO<sub>x</sub> emissions from on-road heavy-duty vehicles and engines. U.S. EPA intends to

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<sup>1</sup> [Optional Reduced NO<sub>x</sub> Emission Standards for On-Road Heavy-duty Engines, 12/12/2013](#)

<sup>2</sup> [Proposed 2016 State Strategy for the State Implementation Plan May 17, 2016](#)

publish a proposed rule in 2020.<sup>3</sup> Accordingly, to the extent possible, CARB plans on coordinating its regulatory efforts with U.S. EPA.

To support the development of lower heavy-duty NOx standards, CARB in partnership with the South Coast Air Quality Management District, the Manufacturers of Emission Control Association, U.S. EPA, Clean High-Efficiency Diesel Engine VII (CHEDE-VII) Consortium (managed by SwRI), Volvo, Cummins, and Eaton are currently funding \$5 million research programs with SwRI to demonstrate the feasibility of lower NOx emissions for on-road heavy-duty engines.

In addition to a new lower NOx standard on current certification test cycles, CARB staff also plan to propose a new certification low load cycle, as well as the associated NOx standard, strengthen engine and emission control system durability requirements, increase useful life requirements and further lengthen warranty periods, improve reporting and corrective action of failing emission control parts covered under warranty, and improve the in-use testing program. CARB's overall low-NOx emission standard package, which will include the amendments discussed above, is tentatively scheduled for Board consideration in March 2020. CARB staff started the public process for this rulemaking with a kick-off public workshop on November 3, 2016. Since then, CARB staff has held seven industry workgroup meetings, and two additional public workshops, to discuss proposed concepts for various elements of the rulemaking, as well as updates on the SwRI low-NOx demonstration programs.

As part of the above-mentioned "Lower In-Use Emission Performance Level" measure, CARB staff had already recently developed and proposed initial amendments to the California on-road heavy-duty vehicle/engine warranty regulations to lengthen existing warranty periods and maintenance provisions to better reflect the longevity and usage of modern vehicles (called Step 1 Warranty). CARB approved these amendments for adoption on June 28, 2018. The amended warranty periods apply to California-certified diesel-fueled engines used in California-registered on-road heavy-duty vehicles greater than 14,000 pounds GVWR, and will increase the length of warranty coverage from 100,000 miles to 350,000 miles for vehicles with heavy heavy-duty engines, 150,000 miles for vehicles with medium heavy-duty engines, and 110,000 miles for vehicles with light heavy-duty engines beginning with the 2022 model year.

To provide manufacturers with some insight going forward as they lock in designs to meet 2024 model year Phase 2 Greenhouse Gas standards, on April 18, 2019, CARB

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<sup>3</sup> [EPA Acting Administrator Wheeler Launches Cleaner Trucks Initiative, 11/13/2018](#)

staff released a White Paper<sup>4</sup> that discussed CARB staff's assessment of NOx reduction measures that would be technologically feasible and cost-effective for model years 2024 through 2026, as well as for model year 2027 and beyond. Elements of the White Paper were discussed with stakeholders in a workgroup meeting on May 7, 2019.

At the workshop, CARB staff will discuss regulatory concepts involving the following:

- Tighter durability demonstration requirements;
- A supplemental low load cycle for certification to demonstrate control of emissions during low load operations;
- Zero emission technology credit provisions;
- HDIUT amendments to more effectively assess in-use compliance under all operating conditions, via use of a protocol similar to the European in-service conformity-testing program,<sup>5</sup> moving average window method;
- Lengthening the useful life for heavy-duty engines, i.e., the period of time or mileage during which the engine's emissions are required to remain at or below the level required by the certification standard;
- Further lengthening of warranty period requirements (called Step 2 Warranty);
- Warranty corrective action amendments to strengthen and enhance the current Emission Warranty and Information Reporting requirements to more readily enact corrective action on the part of the manufacturer based upon warranty claim rates; and
- Lower cap on particulate matter emissions

CARB staff will also present an update regarding the low-NOx demonstration program at SwRI and next steps for CARB's rulemaking.

If participants anticipate having more extensive feedback to present at the workshop than is typically afforded in Question/Answer sessions associated with CARB presentations, please contact the appropriate CARB staff indicated below ahead of the workshop date to discuss potential prior arrangement-related feedback opportunities.

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<sup>4</sup> [CARB Staff White Paper: California Air Resources Board Staff Current Assessment of the Technical Feasibility of Lower NOx Standards and Associated Test Procedures for 2022 and Subsequent Model Year Medium-Duty and Heavy-Duty Diesel Engines, April 18, 2019.](#)

<sup>5</sup> [COMMISSION REGULATION \(EU\) No 582/2011, May 25, 2011](#) and [COMMISSION REGULATION \(EU\) 2018/932, June 29, 2018](#)

## Contact

If you have general questions regarding potential regulatory changes to the certification standards and test procedures, the HDIUT program, and the durability demonstration provisions to be discussed at the workshop, please contact Mr. Daniel Hawelti, Staff Air Pollution Specialist, at (626) 450-6149 or via email at [Daniel.Hawelti@arb.ca.gov](mailto:Daniel.Hawelti@arb.ca.gov).

For questions regarding the proposed revisions to the heavy-duty engine warranty period and useful life requirements, please contact Dr. Nadia Richards, Air Resources Engineer, at (916) 322-8987 or via email at [Nadia.Richards@arb.ca.gov](mailto:Nadia.Richards@arb.ca.gov).

For questions on proposed amendments to the emission warranty information reporting regulations, please contact Adil Mahmood, Air Resources Engineer, at (626) 575-6842 or via email [Adil.Mahmood@arb.ca.gov](mailto:Adil.Mahmood@arb.ca.gov).

## Special Accommodations

If you require a special accommodation or need this document in an alternate format (i.e., braille, large print) or another language, please contact Mr. Daniel Hawelti, Staff Air Pollution Specialist, at (626) 450-6149 or via email at [Daniel.Hawelti@arb.ca.gov](mailto:Daniel.Hawelti@arb.ca.gov), as soon as possible, but no later than 10 business days before the scheduled meeting. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and verbal comments, submitted 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.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia.
- Documentos disponibles en un formato alternativo u otro idioma.
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 324-0342 o envíe un fax a (916) 327-8524 lo más

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pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

Sincerely,

Jack Kitowski, Chief  
Mobile Source Control Division

cc: Daniel Hawelti  
Staff Air Pollution Specialist  
Mobile Source Control Division

Adil Mahmood  
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Emission Compliance, Automotive  
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