

UPDATED INFORMATIVE DIGEST

“LEV III” AMENDMENTS TO THE CALIFORNIA GREENHOUSE GAS AND CRITERIA POLLUTANT EXHAUST AND EVAPORATIVE EMISSION STANDARDS AND TEST PROCEDURES AND TO THE ON-BOARD DIAGNOSTIC SYSTEM REQUIREMENTS FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES, AND TO THE EVAPORATIVE EMISSION REQUIREMENTS FOR HEAVY-DUTY VEHICLES

Sections Affected: Proposed amendments to California Code of Regulations, title 13, sections 1900, 1956.8, 1960.1, 1961, 1961.1, 1965, 1968.2, 1968.5, 1976, 1978, 2037, 2038, 2062, 2112, 2139, 2140, 2145, 2147, 2235, and 2317; and to the following documents incorporated by reference therein: "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as last amended September 27, 2010; "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," as last amended September 27, 2010; "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," as last amended September 27, 2010 ; "Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks," as last amended January 22, 1990; "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," as last amended September 27, 2010; "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as last amended October 12, 2011; "California Environmental Performance Label Specifications for 2009 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles, " as adopted May 2, 2008; "California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels, " as adopted November 2, 1993; and proposed new "Specifications for Fill Pipes and Openings of 2015 and Subsequent Motor Vehicle Fuel Tanks;" and proposed new "California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years."

Proposed adoption in California Code of Regulations, title 13, of new sections 1961.2 and 1961.3 and new "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" incorporated by reference therein, and amendment of the following document incorporated by reference therein: "California Non-Methane Organic Gas Test Procedures," as last amended July 30, 2002.

Background

California's Current Criteria Pollutant Emission Standards

The LEV II Program

In 1999, California adopted the second phase of the Low-Emission Vehicle Program (LEV). These amendments, known as LEV II, set more stringent fleet average non-methane organic gas (NMOG) requirements for model years 2004-2010 for passenger cars and light-duty trucks, established additional emission categories to provide compliance flexibility with the revised fleet average requirements, and established a new emissions category, partial zero-emission vehicle (PZEV) that could be used toward meeting the zero-emission vehicle requirement. The amendments also expanded the heavier light-duty truck category to include trucks and sport utility vehicles up to 8,500 lbs. gross vehicle weight rating (GVWR) and required these vehicles to meet the same emission standards as passenger cars, and extended full useful life from 100,000 miles to 120,000 miles. LEV II amendments also established more stringent emission standards for medium-duty vehicles between 8,501-14,000 lbs GVWR. The following table lists the vehicle classes affected by the current LEV program.

Vehicle Class	Weight Range ¹
Passenger cars	All weights
Light-duty truck 1	0-3750 lbs. LVW
Light-duty truck 2	3751 lbs. LVW – 8,500 lbs. GVWR
Medium-duty vehicle	8,501-10,000 lbs. GVWR
	10,001-14,000 lbs GVWR

Other principal features of the current LEV program follow.

Supplemental FTP Emission Regulations

Emissions from aggressive driving and from air conditioner use are not accounted for during typical emission testing for criteria pollutants, using the Federal Test Procedures. Instead, these “off-cycle” emissions are subject to the California Supplemental Federal Test Procedures (SFTP).

Evaporative Emission Regulations

Compliance with the current evaporative emission regulations, adopted as part of the LEV II Program, is based on meeting three separate certification “whole vehicle” emission standards. Specifically, these include the running loss emission standard, the 3-day diurnal plus high-temperature hot soak (3-day) emission standard, and the 2-day

¹ There are several classifications for vehicles based on weight. Curb weight is defined as the actual weight of the vehicle. Loaded vehicle weight (LVW) is defined as the curb weight plus 300 pounds. GVWR is the maximum designed loaded weight of the vehicle; this means curb weight of the vehicle plus full payload.

diurnal plus moderate-temperature hot soak (2-day) emission standard.² The running loss emission standard ensures evaporative emission control during vehicle driving. The 3-day emission standard ensures that the evaporative system can control evaporative emissions for 3 consecutive hot summer days. The 2-day emission standard ensures an effective strategy to purge the vehicle carbon canister.

As an option, a manufacturer may certify its passenger cars and light-duty trucks to more stringent requirements by complying with zero-evaporative emission standards. Specifically, these requirements consist of more stringent 3-day and 2-day whole vehicle emission standards, as well as a “zero” fuel evaporative emission standard. Over the 2-day and 3-day test procedures, passenger cars must meet a 0.35 grams per test hydrocarbon emission standard (higher levels are allowed for larger vehicles), which includes fuel and non-fuel hydrocarbon emissions. They must also meet the zero-evaporative emission standards, which require a vehicle to emit no more than 0.054 grams per test of fuel-only evaporative emissions. Currently, manufacturers certify to zero-evaporative emission standards in order to qualify for PZEV credits under the Zero-emission Vehicle regulatory mandate. This PZEV certification and crediting applies only if the vehicle’s exhaust emissions are also certified to Super-ultra-low-emission vehicle exhaust standards with a 150,000-mile useful life and a 150,000 mile emission warranty.

Environmental Performance Label

Currently, all new vehicles sold in California must include a California Environmental Performance Label, which provides consumers with a user-friendly scoring system for comparing the relative smog emissions (Smog Score) and global warming emissions (Global Warming Score) from comparable vehicles. Both scores are based on a scale of 1 -10, with 10 being the cleanest and 5 representing an average new car.

Since the spring of 2010, ARB staff has advised U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) on its proposal to revise the Federal Fuel Economy Label, so that as revised it could serve as an alternative to the California Environmental Performance Label.

Important California requirements addressed by the final, adopted federal label included:

- Adding the following statement to the label: “Vehicle emissions are a significant cause of climate change and smog”
- Having a clear statement about upstream emissions and having a clear place to find this information on a regional basis.
- Including all cars in a single rating system rather than segregating by size or class.

² Compliance with the running loss and 3-day emission standards is demonstrated over a 3-day diurnal test procedure. Compliance with the 2-day emission standard is demonstrated over a 2-day diurnal test procedure.

- Including both a Greenhouse Gas (GHG) and Fuel Economy Rating³ and a Smog Rating from 1 to 10 with 10 being best.

In June 2011, U.S. EPA and NHTSA published 40 Code of Federal Regulations Parts 85, 86, and 600 providing requirements for the new Fuel Economy and Environment Label. This new Federal Label is required on all new cars starting with Model Year 2013 and can be affixed earlier on a voluntary basis.

On-Board Diagnostic Systems

Second generation on-board diagnostics (OBD II) systems are comprised mainly of software designed into the vehicle's on-board computer to detect emission control system malfunctions as they occur by monitoring virtually every component and system that can cause an increase in emissions. When an emission-related malfunction is detected, the OBD II system alerts the vehicle owner by illuminating the malfunction indicator light on the instrument panel. By alerting the owner of malfunctions as they occur, repairs can be sought promptly, which results in fewer emissions from the vehicle. Additionally, the OBD II system stores important information including identification of the faulty component or system and the nature of the fault, which typically allow for quick diagnosis and proper repair of the problem by technicians. This helps owners achieve less expensive repairs and promotes repairs done correctly the first time.

In early 2011, manufacturers approached ARB staff and requested regulation changes that they indicated were needed immediately in order to ensure compliance when they certify their 2013 model year vehicles.

In response to the manufacturers' requests, staff agreed to include minor changes to the OBD II regulation, which would have negligible emission impact, as part of the LEV III amendments.

E10 Certification Fuel

The California certification fuel used for testing exhaust and evaporative emissions on passenger cars, light-duty trucks, medium-duty vehicles, and heavy-duty gasoline engines and vehicles currently contains the oxygenate methyl tertiary butyl ether (MTBE) in the quantity of 10.8 to 11.2 volume percent (equivalent to 2.0 percent oxygen by weight). MTBE was banned for use in California gasoline starting December 31, 2003. As a result of the ban of MTBE, ethanol became the prevalent oxygenate used in California gasoline. After the ban, refiners began adding approximately 5.7 volume percent ethanol to gasoline, which is equivalent to 2.0 percent oxygen by weight. California gasoline contained 5.7 percent ethanol until the end of 2009. In 2010, California refiners transitioned to producing gasoline containing 10 percent by volume ethanol (E10). Currently, all gasoline in California contains 10 percent ethanol and will continue to contain 10 percent ethanol for the foreseeable future. While the oxygenate

³ The federal value is tied only to tailpipe GHGs and excludes other vehicular GHGs (e.g. air conditioning refrigerant).

and oxygenate amount have changed in in-use California gasoline, the certification fuel on which emission testing is being done has not.

California's Current (Pavley) Greenhouse Gas Emission Standards

Citing compelling and extraordinary air quality and other impacts California faces from global warming, in 2002 the Legislature passed and the Governor signed Assembly Bill 1493 Pavley. This bill requires ARB to develop and adopt regulations to achieve the maximum feasible and cost-effective reduction of heat-trapping GHG emissions from passenger motor vehicles, beginning with the 2009 model year. The Board approved regulations at its September 2004 hearing, and they were adopted in their final form in August 2005.

Subsequent to that hearing, automakers, California, and the federal government committed to a series of actions to resolve ongoing disputes over the California standards through model year 2016. The result of these commitments was the development of a national GHG program for passenger vehicles that achieves equivalent or better emission reductions as the California program, additional compliance flexibilities provided in the California program, and California's commitment to accept manufacturers' demonstrated compliance with U.S. EPA-adopted GHG standards as compliance with California's standards for the 2012 through 2016 model years.

Development of California's Proposed Greenhouse Gas Emission Standards

In May of 2010, U.S. EPA and NHTSA issued a Notice of Intent to develop GHG emission standards for passenger vehicles for the 2017 through 2025 model years. The Notice requested that U.S. EPA and NHTSA work closely with ARB on a 2010 technical assessment that would evaluate technologies and costs to achieve varying levels of GHG emission reductions through model year 2025. The result was a September 2010 *Interim Technical Assessment Report*, jointly authored by U.S. EPA, NHTSA, and ARB. Subsequent to that collaborative technical work, ARB staff closely monitored the work of U.S. EPA and NHTSA, and the agencies' staffs continued to jointly meet with various stakeholders (e.g., individual automakers, automotive suppliers, environmentalists, labor unions), examine updated technical materials, and develop consistent technology assumptions.

The Board's Regulatory Action:

At its January 26-27, 2012, public hearing, the Air Resources Board (ARB or Board) approved the "LEV III" amendments to the California LEV regulations that reduce emissions of criteria pollutants from new light- and medium-duty vehicles by: reducing fleet average emissions from new passenger cars, light-duty trucks, and medium-duty passenger vehicles to super ultra-low-emission vehicle levels by 2025; replacing separate NMOG and oxides of nitrogen standards (NOx) with combined NMOG plus NOx standards; increasing full useful life durability requirements from 120,000 miles to 150,000 miles, which guarantees vehicles operate longer at these proposed extremely low emission levels; creating a backstop to assure continued production of super-ultra-low-emission vehicles after partial zero-emission vehicles as a category are moved from ZEV program to the LEV III program in 2018; establishing more stringent particulate matter standards for light- and medium-duty vehicles; establishing zero fuel evaporative emission standards for all passenger cars and light-duty trucks, and more stringent evaporative standards for medium-duty vehicles; establishing more stringent SFTP standards for passenger cars and light-duty trucks; and, for the first time, requiring medium-duty vehicles to meet SFTP standards. Other minor amendments (e.g., in-use verification testing requirements, reporting requirements, etc.) were approved to align existing related procedures with the principal amendments.

The amendments also establish more stringent GHG regulations that: are comprised of three emission standards; a carbon dioxide (CO₂) standard, a methane standard and a nitrous oxide standard; use a footprint-based approach to reduce emissions from new light-duty vehicles and medium-duty passenger vehicles; provide credits for improvements to the vehicle air conditioning system (either from the use of a refrigerant with a low Global Warming Potential or by incorporating improvements to the efficiency of the system); provide credits for technologies that reduce CO₂ emissions but are not measured on the applicable test cycles; and provide credits for technology innovations on the largest of pickup trucks.

At the hearing, the staff also presented, and the Board approved modifications to the regulations originally proposed in the Staff Report released on December 7, 2011, in response to comments received after the Staff Report was published, with direction to the Executive Officer to make modifications available for comment. These modifications include: allowing 2015-2019 Model Year LEV II vehicles to certify to combined NMOG+NOx standards instead of separate NMOG and NOx standards; allowing manufacturers to meet the phase-in requirements for the LEV III medium-duty vehicle particulate standards based on a percentage of the combined sales of medium-duty vehicles weighing 8,501 to 10,000 pounds GVWR and medium-duty vehicles weighing 10,001 to 14,000 pounds GVWR, rather than separate percentages for the 2 weight classes; allowing early compliance with 150,000-mile SFTP standards for model year 2014 vehicles; allowing interim in-use SFTP emission standards for new certifications through the 2020 model year; adding NMOG+NOx fleet average standards for the 2014 model year; allowing manufacturers to use projected sales data rather than actual sales data to determine the minimum number of LEV III super-ultra-low-emission vehicles they must produce in the 2018 and subsequent model years; allowing vehicles certified

to federal standards to be included in the fleet average NMOG+NOx calculation based on the actual standards to which they certify; eliminating the requirement that a manufacturer that elects to pool its emissions -- from vehicles sold in California, with those of other states adopting California's standards under section 177 of the federal Clean Air Act (42 U.S.C. § 7507) -- report that selection to ARB prior to the start of each model year to which that selection applies; revising the provisions for trading evaporative emission fleet-average credits among certain vehicle categories; allowing manufacturers to use projected sales data rather than actual sales data to determine the minimum number of vehicles they must produce in the 2015-2017 model years that meet the proposed evaporative emission standards and base compliance for this requirement upon the average number of vehicles produced over the 2015-2017 time period in lieu of a year-by-year requirement; modifying the section 177 state pooling compliance option to specifically set forth required submittal information and to reduce the Executive Officer notification requirement; allowing optional early compliance in the 2014 model year with the proposed evaporative emission standards; and revising the refueling exemption for incomplete medium-duty vehicles.

Subsequent to the hearing, staff identified several additional conforming modifications to the regulations that were needed. The changes, which provided additional compliance flexibility for manufacturer in meeting the LEV III requirements, were made available for a 15-day comment period, along with the changes presented at the hearing, beginning on February 22, 2012. On March 22, 2012, the Executive Officer presented the 15-day changes to the Board for their approval, which was granted. Since these changes do not affect the stringency of the standards, there is no impact of these changes on the effect of the proposed LEV III regulations.