

UPDATED INFORMATIVE DIGEST

ADOPTION OF ENGINE MANUFACTURER DIAGNOSTIC SYSTEM REQUIREMENTS FOR 2007 AND SUBSEQUENT MODEL YEAR HEAVY-DUTY ENGINES

Sections Affected: Adoption of title 13, California Code of Regulations (CCR) section 1971 for 2007 and subsequent model year on-road heavy-duty engines.

Background: The Air Resources Board (the Board or ARB) originally adopted title 13, CCR section 1968.1 in 1989, which required manufacturers to implement second generation on-board diagnostic (OBD II) systems on new motor vehicles sold in California. OBD II systems serve an important role in helping to ensure that vehicles maintain low emissions and meet the emission standards for their full life. The regulation was first implemented beginning with the 1994 model year, and required that essentially all new 1996 and later model year passenger cars, light-duty trucks, and medium-duty vehicles and engines be equipped with OBD II systems. The regulation specifically required monitoring of engine misfire, catalysts, oxygen sensors, evaporative systems, fuel systems, and electronic powertrain components, among other component and systems that can affect emissions when malfunctioning. The regulations also required OBD II systems to provide specific diagnostic information in a standardized format through a standardized serial data link on-board the vehicles. Subsequently, the Board adopted section 1968.2 in 2002, which established OBD II requirements, for 2004 and subsequent model year passenger cars, light-duty trucks, and medium-duty vehicles and engines. The regulation carried over the requirements of section 1968.1, in addition to establishing new requirements to address advances in emission control technology.

Prior to the adoption of section 1971, there were no regulations in California requiring diagnostic systems on heavy-duty vehicles (i.e., vehicles with a gross vehicle weight rating (GVWR) greater than 14,000 pounds). Unfortunately, the emissions emitted from heavy-duty trucks, especially diesel trucks, are of great concern. Currently, diesel truck emissions account for about 28 percent and 16 percent of the total statewide mobile source oxides of nitrogen (NOx) and particulate matter (PM) emissions, respectively. NOx is a precursor to ozone as well as a lung irritant, while diesel PM is carcinogenic and has been identified as a toxic air contaminant by ARB. While emissions from heavy-duty diesels are of particular concern, emissions from heavy-duty gasoline vehicles are also of concern, given the state's ongoing problem in meeting state and federal ambient air quality standards. Additionally, the emission standards for heavy-duty vehicles have become increasingly stringent over the years. By 2004, the heavy-duty diesel emission standards for NOx and PM have been reduced by over 60 to 80 percent compared to the standards in 1990. In 2007, both emission standards would be reduced further by 90 percent compared to the 2004

standards. Emission standards for heavy-duty gasoline vehicles and engines are also similarly reduced in 2008. There must be some assurance that these standards continue to be met in-use, since emission-related malfunctions can cause vehicle emissions to increase well beyond the standards that they are intended to meet.

California's problems with ozone pollution continue to be the worst in the nation. In an effort to meet federal and state ambient air quality standards and comply with the federally mandated State Implementation Plan (SIP) to meet those standards, California has continued to be in the forefront in adopting the most stringent motor vehicle emissions control program in the nation. To complement the new emission standards for heavy-duty diesel engines, measure 17 (M17) was included as part of the SIP. Adopting diagnostic requirements for heavy-duty vehicles is an essential first step towards M17 to reduce emissions from on-road heavy-duty diesels.

To address the above, ARB adopted section 1971, title 13 CCR, which would require first-generation diagnostic systems to be equipped on all 2007 and subsequent model year on-road gasoline- and diesel-fueled heavy-duty engines and vehicles produced for sale in California with a GVWR of greater than 14,000 pounds. ARB's Initial Statement of Reasons for the rulemaking was released on April 2, 2004. On May 20, 2004, the regulation was approved by the Board with modifications. These modifications were made available for public comment in the staff's Notice of Public Availability of Modified Text, released July 26, 2004.

Staff Proposal: The requirements of section 1971, which are referred to as engine manufacturer diagnostic system (EMD) requirements, build on the basic diagnostic system heavy-duty engine manufacturers are currently using to provide diagnostic capability for the most important emission control systems. Having first adopted OBD II requirements for light-duty and medium-duty vehicles in 1989, ARB staff has had extensive experience with OBD systems and in developing diagnostic requirements. Sufficient leadtime exists to implement the EMD system by the 2007 model year when emission standards become more stringent and universal use of particulate filters is expected. The EMD system will help ensure that the engines are able to meet the new emission standards and maintain low emissions for the life of the engine. It will accomplish this by monitoring the durability and performance of the emission control components and systems, and by providing technicians with information that will help in diagnosing and fixing malfunctions.

The regulation, however, does not reflect the level of diagnostics that staff plans on presenting to the Board for consideration in 2005 that will more closely reflect light- and medium-duty OBD II requirements. Recognizing the strict compliance schedule facing engine manufacturers to meet the stringent 2007 model year emission standards and the continued developments in new and emerging emission control technologies, ARB staff did not propose the immediate development of comprehensive OBD systems that require the monitoring of every emission-related component in the vehicle.

The EMD regulation requires manufacturers to monitor the fuel system, exhaust gas recirculation (EGR) system, the PM trap, and emission-related electronic components. Unlike the requirements for light-duty vehicles, the EMD monitoring requirements do not require manufacturers to tie the monitors to the emission standards (i.e., to indicate a malfunction before a specific emission threshold is reached). When a malfunction is detected, the regulation requires the EMD system to illuminate a warning light, which could be an existing light or a new light based on the manufacturer's preference. Additionally, though the EMD system will be required to output diagnostic information for use by repair technicians, the regulation does not establish standardized requirements defining the content or format of specific information required to be outputted.

As stated, this regulation is intended to be the first step towards adopting comprehensive heavy-duty OBD requirements analogous to the OBD II regulation. In the near future, staff will be proposing a more comprehensive OBD regulation for the Board's consideration. The future heavy-duty OBD regulation would address the new and improved emission control technologies used to help meet the 2010 standards as well as include requirements that would assist repair technicians and facilitate implementation of heavy-duty OBD checks in roadside inspection programs.

COMPARABLE FEDERAL REGULATIONS

Currently, the United States Environmental Protection Agency (U.S. EPA) has OBD requirements only for light-duty vehicles and trucks and federally defined "heavy-duty" vehicles and engines with a GVWR between 8,500 to 14,000 pounds. These are the same categories of vehicles covered by ARB's OBD II regulation, which apply to light- and medium-duty vehicles (where medium-duty is defined in California as the 8,500 to 14,000 pound GVWR range). The U.S. EPA currently does not have OBD requirements for vehicles and engines above 14,000 pounds, which is the weight range for California's "heavy-duty" class. The U.S. EPA staff, however, has indicated its intent to propose and adopt an OBD regulation for heavy-duty vehicles and engines over 14,000 pounds in the near future, and indicated a strong interest in developing harmonized ARB and federal OBD programs.