Updated Informative Digest
ADOPTION OF THE HEAVY-DUTY DIESEL ENGINE SOFTWARE UPGRADE REGULATION (CHIP REFLASH)

Sections Affected

This action adopts section 2011 in new article 3.5 within chapter 1, division 3, title 13, California Code of Regulations (CCR) and amends sections 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194 of article 1, chapter 3.5, division 3, title 13, CCR.

Background

In the 1990's, engine manufacturers utilized computer-based strategies on engines in trucks, school buses, urban buses, and motor homes that allowed the engines to comply with emission limits under certification conditions but also allowed increased oxides of nitrogen (NOx) emissions during highway driving. The United States Environmental Protection Agency (U.S. EPA) and ARB consider these strategies to be defeat devices that result in off-cycle emissions.

In 1998, the following manufacturers signed Consent Decrees with the U.S. EPA, the Department of Justice (DOJ), and the ARB: Caterpillar, Cummins, Detroit Diesel, Navistar, Mack/Renault, and Volvo. Similar California-specific documents are called Settlement Agreements. The Consent Decrees stipulate penalties, additional certification requirements, the Low NOx Rebuild Program, an October 2002 deadline for meeting 2004 model year standards, in-use testing, and offset and incentive programs.

The Low NOx Rebuild Program contained in the Consent Decrees concerns engine software upgrades designed to reduce the increased NOx emissions. The Consent Decrees require low NOx rebuild kits to be installed at the time of normal engine rebuild (typically around 200,000 to 300,000 miles of service.) However, heavy-duty diesel engines are performing well for longer periods of time and engine rebuilds occur closer to when the engine has accumulated 750,000 to 1,000,000 miles. Therefore, excess NOx emissions continue to be emitted.

In California, we need to reduce NOx emissions in order to meet federal and state ozone standards. We cannot wait until engines accumulate up to 1,000,000 miles before low NOx software is installed and NOx emissions are reduced. The purpose of the Software Upgrade program is to eliminate that excess NOx emissions from heavy-duty diesel engines eligible for low NOx software now.

Description of Regulatory Action

The ARB staff is reducing air pollution by requiring most owners and operators of trucks, school buses, and motor homes with 1993-1998 model year heavy-duty diesel engines to upgrade the software in the electronic control module (ECM) of these engines. Software upgrades were developed by the engine manufacturers and are available now for most 1993-1998 model year engines. Most owners and operators of eligible vehicles that operate in California must ensure that their vehicles' engines have the appropriate low NOx software installed. Since many 1999 model year vehicles have engines produced in 1998, owners and operators of 1999 model year vehicles will need to check to determine if they are affected. Distributors and dealers must provide the appropriate low NOx software to the vehicle owner or operator upon request.

Only certain engines have low NOx software available. Only those engines that have low NOx software available need to be upgraded. The ARB staff prepared a list that can be checked to determine if low NOx software is available for a particular engine. This list is available from our web site at: http://www.arb.ca.gov/msprog/hdsoftware/hdsoftware.htm

Heavy-duty diesel software upgrade (also referred to as low NOx software upgrade or chip reflash) is simply software installed in the engine that reprograms the vehicle's computer and reduces off-cycle NOx emissions. The installation process typically takes between one-half to one hour.

Owners and operators of 1993-1999 model year heavy-duty diesel vehicles (trucks, school buses, and motor homes) registered out-of-state, but that travel within California, are also required to ensure that the engines in their vehicles have the appropriate low NOx software installed.

The ARB staff believes the applicable Consent Decrees and Settlement Agreements require manufacturers to supply the Low NOx software at no cost whenever it is requested. Out-of-service costs to the vehicle owner can be reduced or eliminated if the low NOx software is installed at the same time as another service or repair.

This regulation requires the low NOx software upgrade to be installed on a schedule that depends on the model year of the engine in the affected vehicle. The schedule is as follows:

1993-1994 model years	By April 30, 2005
1995-1996 model years	By August 31, 2005
1997-1998 model years	By December 31, 2005 (except for medium heavy-duty diesel engines (MHDDEs))
1997-1998 model year MHDDEs	By December 31, 2006

The ARB enforcement staff will verify the installations of the low NOx software through a modified Heavy-Duty Vehicle Inspection Program and modified Heavy-Duty Vehicle Fleet Inspection Program.

Modifications have been incorporated into the regulation to clarify that the engine manufacturers shall provide the low NOx software at no charge and shall reimburse the dealers for the installation of low NOx software. The dealers shall not charge the vehicle owner for the low NOx software or its installation, and penalties are stipulated for dealers authorized to install low NOx software that refuse to install low NOx software. The Low NOx Rebuild Engine list has been revised to more accurately identify engines for which Low NOx Rebuild Kits are available.

Finally, owners of engines manufactured by Detroit Diesel Corporation (DDC) have been exempted from the regulation and can have the low NOx software installed at no charge on a voluntary basis. The Board determined that DDC had met the first target under a voluntary program of installing low NOx software on 35 percent of the California-registered reflashable engines and reducing 35 percent of the off-cycle emissions from those vehicles. Staff will continue to monitor DDC's progress under the voluntary program. Their next target is to install low NOx software on 60 percent of the reflashable engines and reduce 60 percent of the off-cycle emissions from those vehicles by May 2005. Failure to meet this target will result in initiation of a regulatory action to require owners of DDC engines to install low NOx software.