United States Environmental Protection Agency
Air and Radiation
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Office of Mobile Sources

Regulatory Announcement

New Emission Standards For Heavy-Duty Diesel Engines Used In Trucks And Buses

The Environmental Protection Agency (EPA) is adopting a new combined emission standard for oxides of nitrogen (NOx) and hydrocarbons (HC) for model year 2004 and later heavy-duty diesel engines used in trucks and buses. The new standard represents a 50 percent reduction in NOx from the 1998 and later model year NOx standard, and will significantly assist states in meeting and maintaining the ozone National Ambient Air Quality Standards.

What Are the Health and Environmental Benefits?

The new rule requires engines manufactured in 2004 and later model years to have about a 50 percent lower NOx level compared to engines meeting the 1998-2003 model year NOx standard. In 2020, EPA projects a reduction of 1.1 million tons per year in ozone precursors due to the new standard. In addition, the reduction in NOx emissions will also result in a reduction of secondary nitrate particulate matter (PM) (which forms in the atmosphere when NOx combines with ammonia) of about 43,000 tons per year.

NOx is a major contributor to the formation of ground-level ozone. The new standard will benefit public health because ozone exposure causes a range of human pulmonary and respiratory health effects, including chest pain, coughing, and shortness of breath. In addition to ground-level ozone, the secondary impacts of NOx include the formation of nitrate PM, acid rain, and eutrophication of coastal waters. Therefore, reductions in NOx emissions will have considerable benefits to both public health and the environment.

How Much Will the Final Rule Cost?

EPA estimates a near term retail price increase of $260-$470 per vehicle, with costs decreasing to half that amount in five years. The near term increase represents a 2 to 4 percent increase in engine price and less than one percent of the price of most new heavy-duty vehicles. EPA does not expect any increase in fuel consumption due to the new rule. The long term cost effectiveness of the final rule is estimated to be $100-$200 per ton of NOx plus HC.

How Will the Rule Assist States?

The significant reduction in NOx emissions expected from the new standard will assist the states in meeting the National Ambient Air Quality Standards for ozone and PM. NOx emission inventories are projected to rise by the early 2000s due to continued industrial growth and expansion of motor vehicle usage. This is expected to result in a significant increase in ground-level ozone and PM. Without further controls, within the next 20 years mobile sources will contribute to about half of all NOx emissions, with highway heavy-duty engines (HDEs) representing about a quarter of these mobile source NOx emissions. Therefore, further NOx control from HDEs on a national scale is seen as a cost-effective strategy to control ozone levels especially where ozone is high over a large region (as in the Midwest and Northeast).

How Does the Rule Provide Flexibility to Industry?

The final rule provides flexibility to the industry in three main areas:

- Manufacturers can certify their engines to either of two options;

- The time frame for this standard allows for the difficult technological hurdles to be addressed without large increases in engine costs, resulting in what EPA believes will be an extremely cost-effective way of making necessary air quality gains; and

- The flexibility provided by averaging, banking, and trading (ABT) lowers the costs to manufacturers and makes it easier to meet the technical challenges of lower standards.

In addition, engine manufacturers benefit from national emission standards because a single set of emission requirements applying to engines in trucks and buses used anywhere in the country allows manufacturers to achieve economies of scale and to concentrate research and development resources most effectively.

How Did This Initiative Evolve?

In response to the need for additional pollution reduction measures at the national level, EPA held a series of discussions with the California Air Resources Board (CARB) and representatives of the HDE manufacturing industry to exchange views on the appropriateness and feasibility of new emission standards for HDEs. Based on these discussions, a historic Statement of Principles (SOP) regarding highway HDEs was signed by these parties in July 1995. EPA issued an Advance Notice of Proposed Rulemaking (ANPRM) on August 31, 1995, which requested comment on the SOP and the Agency's plans to formally propose new HDE emission standards consistent with the SOP. EPA formally proposed the standard on June 27, 1996. During the comment period for the rulemaking, stakeholders continued their strong support for the new standards.

What are the Main Components of the Final Rule?

Emission Standard

The standard is in the form of combined non-methane hydrocarbons (NMHC) plus NOx and is presented in units of grams emitted per brake horsepower-hour (g/bhp-hr). It applies to diesel engines manufactured for model years 2004 and later. Manufacturers have the choice of certifying their engines to either:

2.4 g/bhp-hr NMHC + NOx or

2.5 g/bhp-hr NMHC + NOx with a limit of 0.5 g/bhp-hr on NMHC

EPA also proposed the above standard for gasoline-fueled engines, but is not finalizing the standard at this time. The Agency is continuing to evaluate new standards for gasoline-fueled engines and is planning a supplemental rulemaking to address gasoline-fueled engines specifically.

In-Use Emission Controls

EPA is adopting provisions to further encourage engine manufacturers to use emission controls that will have a high degree of durability, and will perform well in use without an unreasonable degree of owner involve-

ment. EPA is finalizing other basic provisions to help encourage the maintenance and repair of emission controls after the end of regulatory life is reached, and ensure emission controls are addressed properly during engine rebuilding.

ABT Provisions

EPA is finalizing changes to the ABT provisions to enhance the feasibility and cost-effectiveness of the standards and encourage the early introduction of cleaner engines, thus securing emission benefits earlier than would otherwise be the case.

Technology Review

A technology review will be undertaken in 1999 to assess industry progress and propose changes in the standards if necessary. The potential role of fuels in achieving low HDE emissions is being evaluated now as part of a technical working group comprised of representatives from EPA, the engine manufacturers, the oil industry and other stakeholders. The results of these technical evaluations will be considered as a part of the 1999 technology review.

Does the New Standard Affect Trucks and Buses Already on the Road?

No. The new standard and related provisions only apply to 2004 and later model year engines.

How Can I Obtain a Copy of the Final Rule?

Additional information can be obtained electronically via the EPA Internet server on the World Wide Web at:

http://www.epa.gov/OMSWWW

Information is also available by calling the NOx/ PM Heavy-Duty Engine voice mailbox at: 313-741-7887

or by writing to:

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