United States Environmental Protection Agency

Office of Transportation and Air Quality

EPA420-F-06-027
March 2006

Regulatory Announcement

Light-Duty Diesel Tier 2 Amendments

The U.S. Environmental Protection Agency (EPA) is making minor amendments applicable to light-duty diesel vehicles under the Tier 2 program. The alternative compliance options will last for only three model years (MY) — 2007 through 2009 — during which time advancements in diesel emissions control technologies will be further developed. The two voluntary compliance options would affect a very limited set of standards for nitrogen oxides (NOx), including only high altitude and high speed/high acceleration conditions. These temporary options are designed to be environmentally beneficial. Any vehicle certified to these options, while allowed to meet a less stringent NOx standard when new, would have to meet a 30 percent more stringent NOx standard and a 50 percent more stringent particulate matter (PM) standard for their entire regulatory life. Further, that regulatory life would be extended from 120,000 miles to 150,000 miles.

Background

In 2000, EPA's Tier 2/Gasoline Sulfur final rule established a program to significantly reduce the emissions from new passenger cars and light trucks, including pickup trucks, vans, minivans, and sport-utility vehicles. The program reduces emissions by phasing in a single set of exhaust emission standards that applies to all light-duty vehicles (LDVs), light-duty trucks (LDTs) and larger passenger vehicles. To enable Tier 2 vehicle emission control technologies to be introduced and to maintain the program's effectiveness, EPA also requires reduced gasoline sulfur levels nationwide.

Under the Tier 2 program, manufacturers have the flexibility to certify Tier 2 vehicles to different sets of exhaust emission standards that EPA refers to as "bins." The Tier 2 program implements a structure that has eight emission standard "bins." Each bin represents a set of standards to which manufacturers can certify their vehicles. Manufacturers have to choose the bins so that their corporate sales-weighted average NOx level is no more than 0.07 grams per mile (g/mi).

The program treats vehicles and fuels as a system, combining requirements for much lower emitting vehicles with requirements for much lower levels of sulfur in gasoline. While the Tier 2 program did not require similar changes for sulfur levels in diesel fuel, EPA has mandated the reduction of highway diesel fuel sulfur levels beginning in June 2006. A key component of the Tier 2 program is an emphasis on consistent emission standards regardless of fuel type. However, the Tier 2 program also gives some consideration to the fact that diesel vehicles must accomplish a much greater emission reduction from Tier 1 levels in which emissions from diesel-powered vehicles could be more than twice as high as gasoline vehicles for NOx and, in practice, were almost ten times higher for PM.

As EPA projected, the automotive industry has made rapid advancements in diesel emissions control technologies for NOx and PM, enabling manufacturers to produce diesel vehicles that comply with the primary regulatory requirements of the Tier 2 program. Because diesel vehicles still face some very limited technological challenges in meeting the full suite of Tier 2 requirements, EPA is providing very limited flexibility.

These two narrow areas of emissions control are the most challenging for diesel vehicles due to the relatively high engine loads of the high speed/high acceleration test cycle (known as the US06 test cycle) and the relative lack of oxygen at high altitudes. The new technologies that have been applied to bring these vehicles into Tier 2 compliance will require further fine-tuning to fully address emissions under these conditions. EPA is projecting that, with only a few more interim years of refinement, manufacturers will meet the remaining narrow challenges facing diesel technology.

Overview of Voluntary Compliance Options

This direct final rule (and concurrent proposal) contains two voluntary alternative compliance options for 2007 thru 2009 model year diesel vehicles: the "US06 Option" and the "High Altitude Option."

US06 Option

- An LDV would be allowed to meet a slightly higher 4,000 mile US06 standard for NOx + non-methane hydrocarbons (NMHC) (i.e., 0.25 g/mi vs. 0.14 g/mi).
- In return, any such vehicle must:
  - Meet a Supplemental Federal Test Procedure (SFTP) composite NOx + NMHC standard that is about 30% cleaner than otherwise required (e.g., for a bin 8 vehicle, 0.51 g/mi versus 0.71 g/mi).
  - Extend the regulatory useful life of this standard from 120,000 miles to 150,000 miles.

High Altitude Option

- A bin 7 or bin 8 vehicle, at high altitude *only*, would be allowed to meet a slightly higher *in-use* NOx standard of 1.2x the Federal Test Procedure (FTP) standard to which it is certified. The vehicle's certification standards would remain unchanged.
- In return, any such vehicle must:
  - Meet a PM standard that is 50% cleaner than otherwise required. Such vehicles must meet the bin 5 PM standard of 0.01 g/mi vs. the bin 7/8 PM standard of 0.02 g/mi.
  - Extend the regulatory useful life of all FTP standards from 120,000 miles to 150,000 miles.

Health and Environmental Effects

No adverse health or environmental effects are expected from this rulemaking. The compliance options are designed to be environmentally beneficial. Diesel vehicles making use of these options will be cleaner than otherwise required. Auto manufacturers would have the option to certify diesel cars with slightly higher NOx emissions during their first 4,000 miles of operation (e.g., typically 3 to 4 months of driving), but those cars must have overall NOx emissions 30 percent cleaner over their useful life compared to the permissible levels without these optional provisions. The optional provisions also require diesel vehicles to reduce particulate matter emissions by more than 50 percent. Both options extend the regulatory life of the vehicles to 150,000 miles. Diesel vehicles certifying under these provisions will have diesel particulate filters that reduce diesel PM emissions to levels that previously could only have been accomplished with a gasoline engine. At the same time, these diesel vehicles will maintain their historic fuel economy advantage of 30 percent or more relative to a gasoline vehicle.

For More Information

You can access this rule and supporting documents on EPA's Office of Transportation and Air Quality Web site at:

www.epa.gov/tier2/amendments.htm

For additional information, please contact Robin Moran at:

U.S. Environmental Protection Agency
Office of Transportation and Air Quality
2000 Traverwood Drive
Ann Arbor, MI 48105
734-214-4781
E-mail: moran.robin@epa.gov