

of 15 ppm sulfur fuel in most of these engines for most of their operating lives, gives us confidence that this provision to encourage early use of lower sulfur fuel would be beneficial to the environment overall. As with the proposed change to 300–500 ppm cert fuel for model years 2008–2010, engine manufacturers would design their engines to comply based on the test fuel specifications for certification and compliance testing. The change from a fuel specification for compliance testing that ranges up to 2000 ppm sulfur for Tier 2 and 3 engines to a specification of 500 ppm sulfur maximum could have some limited effect on the emissions control designs used on these Tier 2 and 3 engines, in that it would be slightly easier to meet the Tier 2 and 3 standards using the lower sulfur test fuel. In general, it is reasonable to set specifications of test fuel reflecting representative in-use fuels, and here the engines are expected to be using fuel with sulfur levels of 500 ppm or lower until 2010, and 15 ppm or lower after that. In this case, any impact on expected engine emissions from this change in test fuel for Tier 2 and 3 is expected to be slight.

We note that under current regulations manufacturers are already allowed to conduct testing with certification fuel sulfur levels as low as 300 ppm. The additional proposed provision for early use of 300–500 ppm sulfur test fuel would, however, result in any compliance testing conducted by the Agency being done with fuel meeting the 300–500 ppm specification. Likewise choice of the option for early use of 15 ppm sulfur test fuel would result in any Agency testing being done using that fuel. However, under both of these early certification fuel options involving a recommended fuel use provision, the Agency would not reject engines from in-use testing for which there was evidence or suspicion that the engine had been fueled at some time with higher sulfur fuel.

Finally, we are proposing to extend a provision adopted in the 1998 final rule. In that rule we set a 2000 ppm upper limit on the test fuel sulfur concentration for any testing to be performed by the Agency on Tier 1 engines under 50 hp and Tier 2 engines at or above 50 hp. We did not extend this provision to later model year engines at that time because we felt that more time was needed to assess trends in fuel sulfur levels for fuels used in nonroad diesels. At this time we are not aware of any additional information that would indicate that a change in this test specification is warranted. More importantly, because the fuel regulation

we are proposing would make 500 ppm maximum sulfur nonroad diesel fuel available by mid-2007, Tier 3 engines at or above 50 hp (which phase in beginning in 2006) will be in the field for only 1½ years prior to the in-use introduction of 500 ppm fuel, and Tier 2 engines under 50 hp (which phase in beginning in 2004) will be in the field for at most 3½ years prior to this time. We believe it is appropriate to avoid adding the unnecessary complication of frequent multiple changes to the test fuel specification. We are therefore proposing to extend the 2000 ppm limit to testing conducted on engines until the 2008 model year when the 500 ppm maximum test fuel sulfur level takes effect as discussed above.

#### *I. Labeling and Notification Requirements*

As explained in Section III, the emissions standards contained in the proposed regulations would make it necessary for manufacturers to employ exhaust emission control devices that require very low-sulfur fuel (less than 15 ppm) to ensure proper operation. This action therefore proposes to restrict the sulfur content of diesel fuel used in these engines. However, the 2008 emissions standards would be achievable with less sensitive technologies and thus it could be appropriate for those engines to use diesel fuel with up to 500 ppm sulfur. There could be situations in which vehicles requiring either 15 ppm fuel or 500 ppm may be accidentally or purposely misfueled with higher-sulfur fuel. Any of these misfueling events could seriously degrade the emission performance of sulfur-sensitive exhaust emission control devices, or perhaps destroy their functionality altogether.

In the highway rule we adopted a requirement that heavy-duty vehicle manufacturers notify each purchaser that the vehicle must be fueled only with the applicable low-sulfur diesel fuel. We also required that diesel vehicles be equipped by the manufacturer with labels near the refueling inlet to indicate that low sulfur fuel is required.<sup>315</sup> We are proposing similar requirements here. Specifically, we are proposing that manufacturers notify each purchaser that the nonroad engine must be fueled only with the applicable low-sulfur diesel fuel, and ensure that the equipment is labeled near the refueling inlet to indicate that low sulfur fuel is

required. We believe that these measures would help owners find and use the correct fuel and would be sufficient to address misfueling concerns. Thus, more costly provisions, such as fuel inlet restrictors, should not be necessary.

Beginning in model year 2011, the required fuel would be 15 ppm. For these engines, the label should state: “ULTRA LOW-SULFUR NONROAD DIESEL FUEL OR ON-HIGHWAY DIESEL FUEL ONLY (15 parts per million)”. For model years 2008 to 2010, when the proposed test fuel would contain 300 to 500 ppm sulfur, the label should state: “LOW-SULFUR NONROAD DIESEL FUEL, ULTRA LOW-SULFUR NONROAD DIESEL FUEL, OR ON-HIGHWAY DIESEL FUEL ONLY (500 ppm maximum)”. Engine manufacturers may choose during earlier model years to certify engines using test fuel with sulfur levels between 500 and 2,000 ppm. We would not require that these engines be labeled.

This approach would ensure that the proper functioning of the emission controls is not compromised by misfueling, while allowing owners flexibility with respect to in-use fuels in those cases in which their engines do not use sulfur-sensitive technologies.

For non-integrated manufacturers, the engine manufacturer will be required to provide such a label to the equipment manufacturer, which the equipment manufacturer will be required to install. Optionally, if an equipment manufacturer chooses to install its own label, the engine manufacturer will not be required to provide the label.

#### *J. Temporary In-Use Compliance Margins*

The Tier 4 standards will be challenging for diesel engine manufacturers to achieve, and will require manufacturers to develop and adapt new technologies for a large number and wide variety of engine platforms. Not only will manufacturers be responsible for ensuring that these technologies will allow engines to meet the standards at the time of certification, they will also have to ensure that these technologies continue to be highly effective in a wide range of in-use environments so that their engines would comply in use when tested by EPA. Furthermore, for the first time, these nonroad diesel engines will be subject to a new transient test cycle and NTE standards. However, in the early years of a program that introduces new technology, there are risks of in-use compliance problems that may not appear in the certification process or

<sup>315</sup> We also required that highway vehicles be labeled on the dashboard. Given the type of equipment using nonroad CI engines, we are proposing equivalent dashboard requirement here.