
Regulatory Announcement

Changed Test Procedures for Nonroad Engines and Heavy-Duty Highway Engines

The U.S. Environmental Protection Agency (EPA) is revising the procedures for testing various categories of nonroad engines. We are also applying these same procedures to heavy-duty highway engines. This common set of test requirements is intended to streamline laboratory efforts for EPA and industry and to form the basis for internationally harmonized test procedures for nearly all categories of engines.

Background

As part of our initiative to update the content, organization and writing style of our regulations, we are revising our test procedures. We have grouped all our engine-dynamometer and field-testing procedures into one part entitled, “Part 1065: Engine-Testing Procedures.”

In the past, each engine or vehicle sector had its own set of testing procedures. There are many similarities in test procedures across the various sectors. However, as we introduced new regulations for individual sectors, the more recent regulations featured test procedure updates and improvements that the other sectors did not have. As this process continued, we recognized that a single set of test procedures would allow for improvements to occur simultaneously across engine and vehicle sectors. In addition, the single set of test procedures is easier to understand, and will provide the basis for harmonizing international test procedures.

This rulemaking will create unified testing requirements for all engines, which will streamline laboratory efforts for EPA and industry.

Overview of the Revised Regulations

Part 1065 is also advantageous for in-use testing because it specifies the same procedures for all common parts of laboratory and field testing. It contains new provisions to help ensure that an engine's operation in the laboratory is much like in-use operation in the field. These new provisions will ensure that laboratory testing and field testing are conducted consistently.

In addition to reorganizing and rewriting the test procedures for improved clarity, we are making a variety of changes to improve the content of the testing specifications, including the following:

- Writing specifications and calculations in international units.
- Adding procedures by which manufacturers can demonstrate that alternate test procedures are equivalent to specified procedures.
- Including specifications for new measurement technology that has been shown to be equivalent or more accurate than existing technology.
- Adopting procedures that improve test repeatability and calculations that simplify determination of emission mass.
- Specifying new procedures for testing engines in the field.
- Defining calibration and accuracy specifications that are scaled to the applicable standard, which allows us to adopt a single specification that applies to a wide range of engine sizes and applications.
- Using a more comprehensive set of definitions, references, and symbols.

Some emission-control programs already rely on the test procedures in part 1065, including those for land-based nonroad diesel engines, recreational vehicles, and nonroad spark-ignition engines over 19 kW. We are also adopting the lab-testing and field-testing specifications in part 1065 for all heavy-duty highway engines. In the future, we plan to apply the test procedures specified in part 1065 to other types of engines, so we encourage companies involved in producing or testing other engines to stay informed of developments related to these test procedures.

For heavy-duty highway engines, the procedures in part 1065 replace those currently published in 40 CFR part 86, subpart N. We are scheduling a gradual transition from the part 86 procedures. We will allow the use of part 1065 procedures as an option through the 2009 model year. Starting in the 2010 model year, part 1065 procedures will be required for any new testing. For all testing completed for 2009 and earlier model years, manufacturers may

continue to rely on carryover test data based on part 86 procedures to certify engine families in later years. In addition, other subparts in part 86, as well as regulations for many different nonroad engines refer to the test procedures in part 86. We are including updated references for all these other programs to refer instead to the appropriate cite in part 1065.

The previous version of part 1065 included regulations for portable emission measurements systems (PEMS). In this rule, we have revised those regulations to reflect current state of the art PEMS technology. PEMS measurements generally rely on the same types of analyzers as those used in laboratory testing, but they need to be smaller and more durable. The main differences between PEMS and laboratory systems are that, with PEMS, emissions are sampled from the raw undiluted exhaust, and engine power is calculated using signals from the engine computer rather than being measured using a laboratory dynamometer. For more information about PEMS testing, see the Technical Support Document for the Heavy-Duty In-Use Testing Final Rule (EPA420-R-05-006, June 2005) at www.epa.gov/otaq/testingregs.htm#tech.

We are also adopting a requirement that manufacturers of heavy-duty highway engines use ramped-modal testing to show that they meet steady-state emission standards using the Supplemental Emissions Test (SET). Much like the part 1065 procedures, the ramped-modal testing is optional through 2009 and becomes mandatory in the 2010 model year. The conventional approach for steady-state testing is to measure emissions separately for each mode. Ramped-modal testing involves a single, continuous emission measurement as the engine operates over the test modes in a defined sequence, including short transition segments between modes. Ramped-modal testing offers several advantages, including increased accuracy for measuring very low levels of particulate matter emissions and substantially reduced testing time.

Interface with Global Technical Regulations

As part of the United States delegation to the United Nations' Working Party on Pollution and Energy (GRPE), we remain committed to moving forward with the process of developing a global technical regulation for testing engines. We believe that the test procedures adopted in part 1065 in this final rule will be the best means to accomplish this goal. The part 1065 test procedures are the result of more than two years of intensive effort in coordination with engine manufacturers (representing a large portion of the global market), instrument manufacturers, and national government agencies. We are adopting this final rule with the understanding that the provisions of part 1065 address every significant issue raised by all these participants. The result of this process is an exceptionally robust set of procedures. Part 1065 is written to address testing

for very large and very small engines, for all types of applications and fuels (including oxygenated fuels), and for both laboratory and in-field measurements. Specifications are provided for all types of analyzers that are currently considered state-of-the-art, with a clear process for establishing alternative procedures for analyzers or measurement methods that will be developed in the future, such as partial-flow sampling for transient measurements of particulate matter.

For More Information

You can access documents on this final rule on the Office of Transportation and Air Quality Web site at:

www.epa.gov/otaq/testingregs.htm

You can also contact us at:

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