

nonroad diesel equipment include power generating sets which are very tightly governed for operating speed changes. Other "constant speed" equipment may be less closely regulated for changes in speed such as those that utilize a 3% droop-type of engine speed governor. One might expect that this latter group would more easily pass cycle performance statistics over a constant speed transient test than the more speed change-sensitive former group, represented by electrical generating sets, for example. However, both types of constant speed engines experience some fluctuations in speed and load during operation in-use and the CSVL duty cycle would capture emissions from these infrequent modes of operation, as well.

Transient testing requires consideration of statistical parameters for verifying that test engines adequately follow the prescribed schedule of speed and load values. The proposed regulations in § 1065.530 detail these statistical parameters (or "cycle statistics") for nonroad diesel engines. These values are somewhat different than the comparable values for highway diesel engines to take into account the characteristics of the nonroad composite cycle and the CSVL cycle. Note also that we are proposing to modify certain cycle statistics previously established for nonroad spark-ignition engines. These changes generally allow testing spark-ignition engines in a way that follows the speed and load traces somewhat less precisely than previously established. All of the proposed changes for spark-ignition engines are consistent with the comparable cycle statistics we are proposing for nonroad diesel engines.

While designed to control for a broad range of constant-speed nonroad engines, the Agency's CSVL cycle has an average speed which may be lower than the speed which a manufacturer considers optimal for their engines in-use. Further, EPA recognizes that some constant speed equipment may operate near or at its rated engine rpm during much of that equipment's useful life. As such, EPA is proposing that constant-speed engines tested in the laboratory with installed speed governors be required to meet cycle statistics for engine load, but not for engine speed. This addresses the concern that different engines may have different degrees of engine speed variation and that some engines may be set to operate at speeds slightly different than the defined point of maximum test speed. At the same time, the installed governor forces the test engine to operate in a way that is representative of in-use

operation. This is described further in Chapter 4 of the Draft RIA for this rulemaking.

Engine manufacturers have raised additional concerns about designing constant-speed engines to meet emission standards over the CSVL cycle. These concerns generally focus on the fact that the cycle has relatively light engine loads and is derived from an arc welder powered by a naturally aspirated engine. Manufacturers questioned the representativeness of this cycle for generators, which is a more common application for constant-speed engines. We continue to believe that transient testing of these engines will add assurance that they control emissions under real in-use operation. While the CSVL cycle does not capture the full operating experience of every engine application, we believe that engines designed to this cycle will control emissions effectively under other types of transient operation not specifically included in the certification procedure. Especially given the anticipated emission-control technologies, we believe engines that are capable of meeting emission standards on the CSVL cycle will have the transient-response characteristics that are appropriate for controlling emissions at higher engine loads and for less dynamic transient operation. At the same time, we share engine manufacturers' interest in creating duty cycles that achieve in-use emission reductions without requiring approaches that lead to laboratory improvements unrelated to an engine's in-use operation. We are therefore expecting to continue discussions with engine manufacturers to pursue the possibility of developing a constant-speed transient cycle that addresses these concerns. We request comment on the extent to which the CSVL cycle will pose design burdens or constraints unrelated to improving in-use emission control.

EPA recently adopted a similar transient duty cycle for spark-ignition constant-speed engines (67 FR 68242, 68298–99, November 8, 2002). This duty cycle, which is based on the same underlying engine operation of an arc welder powered by a diesel engine, includes a combination of equal parts typical and high-transient operation. There was no effort to modify the schedule of engine operation to make it more representative of spark-ignition engines, so the expectation was that the same cycle would eventually apply to nonroad diesel engines. Aside from the different selection of engine operation from the available operating welder described above, the proposed constant-

speed transient cycle includes several adjustments that would need to be factored into the "spark-ignition" cycle before it could be applied to nonroad diesel engines. These adjustments include renormalization with a more robust engine map (based on updated specifications of the original engine) and "I-alpha" corrections to synchronize measurements made with and without a flywheel (see Section 4.2.8.1 of the Draft RIA). EPA requests comment on whether the previously adopted constant-speed transient cycle (in modified form) should apply equally to nonroad diesel engines. Conversely, if EPA adopts the proposed constant-speed transient cycle for nonroad diesel engines, we would expect to change the regulations for spark-ignition engines to align with the conclusions in this rulemaking. EPA accordingly requests comment on these same issues as they relate to spark-ignition engines.

EPA is proposing an optional test cycle specifically for engines used in transport refrigeration units (TRUs). These engines would be certified to a four-mode steady-state duty cycle, developed by the California-EPA Air Resources Board.³¹⁰ Two modes would be run at the engine's maximum test speed, one mode at 50% of observed engine torque and the other mode at 75% of observed engine torque. The third and fourth modes would be run at the engine's intermediate test speed and, again, one mode would be run at 50% of observed engine torque and the other mode at 75% of observed engine torque. All four modes would be weighted equally in determining an operating mode's contribution to the engine's emissions.

Manufacturers certifying engines to the TRU cycle would need to state on the emission control label that the engines may only be used in TRUs, provide installation instructions to ensure they will operate only in the modes covered by the test cycle, and keep records on delivery destinations for these engines. Although these engines would not be subject to a transient duty cycle, they would be subject to not-to-exceed standards based on any normal operation that they might experience in the field. Manufacturers of these engines may petition EPA at certification for a waiver of the requirement to provide smoke emission data for their constant-torque engines. We request comment on whether different modes, or different weighting

³¹⁰ Information on the proposed TRU cycle may be found on the California ARB Web site at <http://www.arb.ca.gov/diesel/dieselrrp.htm>.