



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY
 2565 PLYMOUTH ROAD
 ANN ARBOR, MICHIGAN 48105-2498

FEB 25 1999

OFFICE OF
 AIR AND RADIATION

**GUIDANCE TO STATES ON SMOKE OPACITY CUTPOINTS
 TO BE USED WITH THE SAE J1667 IN-USE SMOKE TEST PROCEDURE¹**

On April 3, 1997, the Office of Mobile Sources of the Environmental Protection Agency (EPA) provided guidance to the States recommending the SAE J1667 smoke test procedure² for the in-use smoke testing of highway heavy-duty diesel vehicles (HDDVs). The purpose of that guidance was to promote consistency among state-operated in-use smoke testing programs. As a result of that guidance, several States are now using or considering the recommended SAE J1667 test procedure. EPA is pleased to know that the guidance provided in April 1997 served its purpose. However, EPA realized that in order to bring full uniformity among state-operated smoke testing programs, additional guidance was needed for States to adopt similar opacity cutpoints when using the SAE J1667 test procedure. As part of its efforts to continue promoting consistency by providing assistance to States regarding in-use testing programs, EPA is now recommending specific opacity cutpoints to be used with the previously recommended SAE J1667 test procedure. The opacity cutpoints recommended through this guidance are: 40% for vehicles 1991 and newer and 55% for vehicles 1990 and older.³ These cutpoints are recommended to be used in determining smoke test failures when using the previously recommended SAE J1667 test procedure during state-operated in-use testing programs.

This guidance is based on the results of a study⁴ conducted by SAE as part of a cooperative agreement with EPA to evaluate state-operated smoke testing programs. Under the cooperative agreement, SAE conducted a comprehensive survey of existing and planned programs. The survey was distributed to States and other stakeholders. Of the States that

¹ This guidance document is not a mandated regulation, but a recommendation that States can follow in their implementation of in-use smoke testing programs.

² The procedure SAE J1667, entitled Snap Acceleration Smoke Test Procedure for Heavy-Duty Diesel Vehicles, was developed between 1992 and 1996 by a committee of members representing the trucking industry, heavy-duty engine manufacturers, test equipment manufacturers, and state and federal regulators. The SAE procedure includes the test method to be used, instrument specifications, and correction factors for ambient conditions. SAE J1667, issued in February 1996, is a snap acceleration test under idle conditions, using engine inertia for loading, and is specifically designed for identifying excessive smoke emitters. Since it is a non-moving vehicle test, the SAE J1667 can be conducted along the roadside or in a test facility.

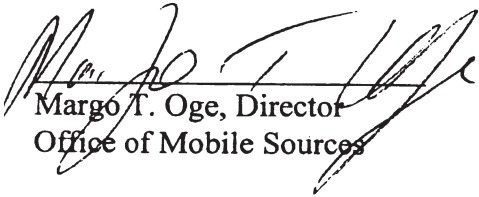
³ The recommended cutpoints are intended to be net values after correction for ambient test conditions, as specified in the SAE J1667 test procedure Appendix B "Corrections for Ambient Test Conditions" model.

⁴ SAE International Cooperative Research Program, Report to U.S. EPA Under Assistance Agreement CX825906-01-0, "Establishment of Smoke Opacity Cutpoints for SAE J1667 Test Procedure," November 1998.

responded approximately 86% are using or planning to use SAE J1667. Of those States using SAE J1667, 83% were found to utilize cutpoints of 40% for vehicles 1991 or newer and 55% for vehicles 1990 or older. Those States that were using higher cutpoints were found to be high altitude States. It was determined that when the higher cutpoints were corrected for altitude, they were in line with the 40/55% limits. During various discussions with stakeholders, it was clear that States support the 40/55% limits, once corrected for altitude. Also, there was agreement among the participating States and stakeholders that cutpoints at the 40/55% levels yielded good results at screening gross polluters.

The purpose of this guidance is to encourage States to use similar smoke opacity cutpoints in their in-use testing programs. Although the Clean Air Act Amendments of 1990 do not require States to implement in-use testing programs for highway HDDVs, many States today are doing so to address public concerns about in-use emissions from these vehicles. Excessive emission of black smoke from highway HDDVs is one of the most common complaints received from the public by state and local air quality agencies. Since the excessive emission of black smoke is often an indicator that an engine is in need of maintenance and/or repair, States are focusing on smoke opacity measurements as part of their in-use testing programs. EPA is aware of several States that have adopted or are considering adopting some form of in-use smoke emission test for highway HDDVs.

Because many highway HDDVs move across State boundaries, EPA believes that uniformity among state-operated smoke testing programs is desirable and appropriate. Thus, EPA is hereby recommending that the States adopt the opacity cutpoints described in this guidance (i.e., 40% for vehicles 1991 or newer and 55% for vehicles 1990 and older) when using the SAE J1667 test procedure. These cutpoints are being used by the majority of the States and are viewed favorably by stakeholders, as reported in the SAE study referenced in this guidance.


Margo T. Oge, Director
Office of Mobile Sources

Date 2-25-99