



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 25 2006

OFFICE OF
AIR AND RADIATION

CISD-06-15 (MC)

Dear Manufacturer:

SUBJECT: Certification Procedure for Highway Motorcycle Engines

I. Background

EPA adopted revised emission standards and test procedures for highway motorcycles on December 23, 2003 (published at 69 FR 2398-2445, on January 15, 2004). These emission standards apply to highway motorcycles and are based on the use of a chassis test procedure. The standards apply to motorcycles and not motorcycle engines. There has been interest among independent engine manufacturers, small custom motorcycle manufacturers, and individuals wanting to build kit motorcycles for EPA to allow the certification and sales of highway motorcycle engines. The California Air Resources Board (CARB) has a policy under which engines built by an independent engine manufacturer can be certified for installation in a motorcycle chassis manufactured or assembled by another person. The CARB policy is based on using a chassis-based certification test procedure for engines. Under the CARB approach, the engine manufacturer provides a comprehensive list of all the highway motorcycle models into which its engines are to be installed, and then installs and tests its engine in the model likely to have the highest emissions (i.e. the "worst case" emissions model).

An important objective of our 2003 revisions was to harmonize as much as possible with the CARB highway motorcycle program. While we declined at that time to adopt separate engine test procedures to address the needs of replacement and custom-bike engine manufacturers, we did note the CARB replacement engine certification procedure, and stated that "We do not see any reason why engine manufacturers wouldn't continue this same practice nationally once our new regulations take effect."¹ In the preamble to the final rule, we also said that "we intend to pursue development of a program that would apply emission standards to motorcycle engine manufacturers."² Until that time, we believe that it is possible to certify motorcycle engines, using the chassis-based FTP test cycle, to highway motorcycle standards.

¹ "Summary and Analysis of Comments: Control of Emissions from Highway Motorcycles," U.S. EPA, Office of Transportation and Air Quality, December 2003, at p. 21. See <http://www.epa.gov/otaq/regs/roadbike/420r03016.pdf>.

² Federal Register, Vol. 69, No. 10, pg. 2404, January 15, 2004.
Internet Address (URL) • <http://www.epa.gov>

The purpose of this letter is to implement the approach described above by adopting a “worst-case” engine certification process as part of the national program for highway motorcycles.³

II. Certification Procedure

A. Applicability. EPA will certify new engines as in compliance with its regulations at 40 CFR part 86, subparts E and F, if the following requirements are met and if the engines are produced for installation in (1) a new highway motorcycle chassis produced by a small volume manufacturer or assembled from component parts by an individual, or (2) a highway motorcycle provided in kit form. New highway motorcycles certified in this manner may be operated or re-sold without restriction, as long as all requirements of this procedure are met and the anti-tampering requirements of the federal Clean Air Act (42 U.S. C. sec. 203(a)) are met. This procedure shall apply beginning with the 2006 model year.

B. Emissions Standards. The standards applicable under this provision shall be based on the volume of new engines for highway motorcycles produced by the engine manufacturer applying for certification. Engine manufacturers producing fewer than 3,000 such engines per year for sale in the United States shall be subject to the standards applicable to Small Volume Manufacturers of motorcycles. Engine manufacturers producing 3,000 or more such engines per year for sale in the United States shall be subject to the standards applicable to Large Volume Manufacturers. (Small Volume Manufacturers of motorcycles who independently apply for certification shall be subject to the standards applicable to Small Volume Manufacturers if the engine certification option is not used.)

C. Identification of Worst Case Vehicle. EPA will consider the “worst case” vehicle for emissions purposes to be a motorcycle that has the highest test weight (loaded vehicle mass) and highest engine speed-to-vehicle speed (N/V) ratio of all motorcycles in which the engine is intended to be installed. The actual weight of the motorcycle tested should simulate the highest weight vehicle for which the engine is intended. The N/V ratio is the engine rpm in top gear divided by the vehicle speed in miles per hour. The N/V ratio may be determined based on dynamometer testing or calculated based on rolling radius and gear ratios for vehicles with manual transmissions and clutches that are locked up in top gear. The type of transmission used in the worst case vehicle shall be representative of the most common transmission the engine manufacturers expects to be used by small volume manufacturers or used in highway motorcycles assembled from kits.

D. Vehicle Testing. The engine manufacturer shall arrange for the worst case vehicle identified under C. above to be tested for exhaust emissions using a worst case engine in accordance with sections 86.425-78 through 86.430-78. During testing, the dynamometer shall be set to simulate loaded vehicle mass of the heaviest motorcycle

³ This procedure applies to engines displacing 50 cc and over. For engines under 50 cc, see 40 CFR 86.447-226 and 86.448-2006.

in which the engine manufacturer intends for a certified engine to be installed. The manufacturer shall develop deterioration factors in accordance with 40 CFR sections 86.432-78 through 86.436-78. If the test results show, after application of the deterioration factors, that the worst case vehicle complies with the applicable standard for each pollutant, as set forth in 40 CFR 86.410-2006, and if all other requirements of this procedure are met, the engine shall be certified for use in all highway motorcycles having a N/V ratio and loaded vehicle mass equal to or less than those values for the worst case vehicle. If the engine is from a group defined under paragraph E below, the engine with the highest horsepower rating will generally be selected as the representative worst case test engine; however, the engine manufacturer may propose a different model for testing if the manufacturer believes that it is likely to have higher emissions with the deterioration factor applied. The selection of the worst case engine shall be based on the engine calibration, cam timing, and other factors that are likely to maximize exhaust emissions levels. The basis for the manufacturer's recommendation shall be explained in the application for certification.

E. Grouping of Engines. This procedure shall apply to each engine type separately, except that a manufacturer may group engines in the same engine family for the purpose of selecting one representative emissions test engine and establishing deterioration factors. If grouping of engines is approved, EPA will issue one certificate covering all engine models in the group. The engine family criteria in 40 CFR 86.420-78 should be used to determine whether one engine may represent other engines for testing and establishing deterioration factors.

F. Delivery of Engines. Engine manufacturers shall provide installation instructions to the vehicle manufacturer or kit manufacturer which meet the requirements outlined for nonroad engines in 40 CFR 1051.130. When an engine manufacturer delivers an engine that has been certified under this procedure to a small volume manufacturer or to a kit manufacturer or assembler, the following information/items must also accompany the engine:

- 1) A statement that the engine may be installed only in a highway motorcycle or kit with an N/V ratio less than or equal to a specified value (which shall be the N/V ratio of the worst case test vehicle).
- 2) A statement that the engine may be installed only in a highway motorcycle or kit below a specified weight (which shall be 80 kg less than the loaded vehicle mass used during testing).
- 3) A statement that no changes may be made to the engine that could reasonably be expected to increase its exhaust emissions for any pollutant, including changes to the fuel metering system; changes to the ignition system; changes to the camshaft; and modifying, recalibrating, removing, or failing to properly install any other specified component.

4) For engines to be installed in a completed chassis, a description of the fuel tank, fuel lines, vapor lines, fuel cap, gaskets, fittings, o-rings and other permeable components that must be installed on the vehicle, which may be the components previously certified for that vehicle by a highway motorcycle manufacturer, or a fuel tank and fuel line that meet EPA evaporative requirements through exemption (e.g. steel tanks) or through EPA design-based certification. For engines to be installed as part of a kit, the kit must include a fuel tank and fuel line that meet EPA evaporative requirements through exemption (e.g. steel tanks) or through EPA design-based certification.

5) For engines certified with an exhaust system containing one or more catalytic converters, a complete exhaust system designed to properly fit the motorcycle into which the engine is to be installed and a statement that the engine is not legal for use in a motorcycle unless the supplied exhaust system is installed. For engines certified without catalytic converters, the minimum and maximum exhaust backpressure limits must be specified along with the point where backpressure is measured.

6) A statement that failure to meet the requirements of paragraphs 1), 2), 3), 4) and 5) above will make the vehicle manufacturer, or the kit manufacturer or assembler, as applicable, liable for violation of certification, introduction into commerce, and anti-tampering requirements, as provided under the federal Clean Air Act and U.S. EPA regulations, and subject to monetary fines and other penalties.

7) A label that meets the requirements of paragraph G. below, and an explanation of where and how the label is to be permanently installed on the vehicle.

8) An engine owner's manual that is to be provided to the ultimate purchaser that complies with the warranty, maintenance instructions, and anti-tampering requirements in H., I, and J. below.

G. Label Requirements. The label shall be a permanent, legible label that contains all the information specified in 40 CFR 86.413-2006(a) (4) (as revised by 70 FR 40420, July 13, 2005), plus the engine serial number and the following statement: "See engine owner's manual for information regarding emissions warranty, maintenance instructions, and tampering prohibitions." The label may include other information required by CARB. The label shall be installed on the frame of the motorcycle or on a plate permanently attached to the frame of the motorcycle in a location that is visible when the seat of the motorcycle has been removed. Alternative locations for the label on motorcycles produced by small volume manufacturers may be approved by EPA at the request of the engine manufacturer.

H. Replacement Parts, Service and Warranty. Any certification issued under this procedure shall be conditioned on full compliance with the design and defects emissions

warranty requirements in the federal Clean Air Act (42 U.S.C. 207(a)) for the applicable useful life of the motorcycle (as specified in 40 CFR 86.402-98) in which the engine is installed. The owner's manual provided by the engine manufacturer under F. 8. above shall contain a statement of the applicable warranty, and a clear procedure for the vehicle owner to obtain parts, service and warranty repairs on the motorcycle.

I. Maintenance Instructions. The owner's manual provided by the engine manufacturer under F. 7. above shall contain maintenance instructions for the ultimate purchaser that comply with 40 CFR sections 86.411-78 and 86.412-78.

J. Tampering Prohibition. The owner's manual provided by the engine manufacturer under F.7. above shall contain an explanation of the tampering and defeat device prohibitions applicable under the federal Clean Air Act (42 U.S.C 203(a) (3)).

K. Highway Motorcycle and Kit Manufacturers. A small volume manufacturer of highway motorcycles; a producer, seller, or assembler of highway motorcycle kits; or an individual is not required to apply for or receive EPA certification to install an engine certified under this procedure, provided such person:

- 1) Installs a certified engine and emission related components following the installation instructions provided by the engine manufacturer;
- 2) Does not install the engine in a vehicle that exceeds the weight and N/V limits used to certify the engine and also does not modify the engine and emission related components in a way which could reasonably be expected to affect emissions;
- 3) For engines certified to permeation standards, uses or installs the evaporative emission system parts supplied or specified by the engine manufacturer;
- 4) Permanently affixes the required engine manufacturer's label in a readily accessible location on the vehicle; and
- 5) Assures that the owners manual and warranty booklet are provided to the ultimate purchaser.

L. Annual Report. Any manufacturer of an engine certified under this procedure shall submit to EPA, no later than 60 days after the completion of a model year, a report that provides the total number and serial numbers of certified engines produced for the model year, as specified in section 86.415-78(b).

M. Application. An engine manufacturer that desires to have an engine certified under this procedure must submit a written application that contains all information needed to demonstrate compliance with this procedure. In general, the application should contain the same information needed for certification of a motorcycle chassis, as specified in 40 CFR 86.416-80, except where the information requirements

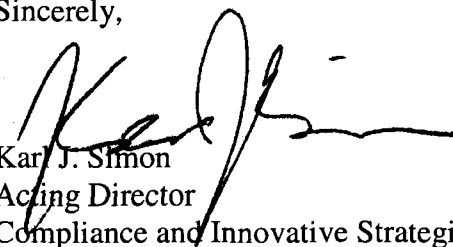
under this procedure are different. There are several handouts from our March 9, 2005 workshop on highway motorcycle certification that provide guidance to the most recent EPA application format for highway motorcycles and how it may be modified to meet the requirements of this procedure. These handouts can be found on our website at <http://www.epa.gov/otaq/roadbike.htm>. EPA will notify the manufacturer within 30 days of receipt of an application if additional information is needed, and will specify the required information. Applications should be addressed to:

Motorcycle/ATV Certification Team
Compliance and Innovative Strategies Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
2000 Traverwood Drive
Ann Arbor, Michigan 48105

N. Issuance of Certificate of Conformity. EPA will issue a certificate of conformity to the engine manufacturer for an engine that meets the requirements of these procedures. EPA may impose conditions as reasonably necessary to assure compliance with these procedures.

For further information or assistance, please contact Linc Wehrly at 734-214-4286 or wehrly.linc@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'Karl J. Simon', written over the typed name and title.

Karl J. Simon
Acting Director
Compliance and Innovative Strategies Division