



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY
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OFFICE OF
AIR AND RADIATION

September 1, 2005

CCD-05-16 (LD-AFC)

SUBJECT: EPA Approval of OBD II Systems on Aftermarket Alternative Fuel Conversions

Dear Manufacturer:

This letter provides guidance for aftermarket alternative fuel converters on how to obtain EPA approval of the on-board diagnostics (OBD) II system. This guidance applies to converters who certify 2005 and later model year (MY) light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles, and 2007 and later MY heavy-duty vehicles

Background

The EPA OBD II requirements are presented in 40 CFR §86.1806-05. Section 86.1806-05(b) describes which emission control related malfunctions must be detected and identified. The components and conditions which must be monitored include: catalysts (detection of an increase in NMHC of 1.5 times the standards), engine misfire, oxygen sensors, evaporative leaks (does not apply to closed fueling systems such as liquified petroleum gas (LPG) or compressed natural gas (CNG)), other emission control systems (includes EGR if so equipped, secondary air systems if so equipped, and the fuel control system, which singularly result in exhaust emissions exceeding 1.5 times the applicable standards for NMHC, CO, NO_x, or diesel PM), and other emission-related powertrain components which have a measurable impact on emissions.

EPA guidance letters CCD-02-12 dated August 29, 2002, and CCD-04-20 dated October 1, 2004, describe EPA policies pertaining to certifying aftermarket alternative fuels conversions.

Question No. 30 in the October 1, 2004 letter and its answer describe EPA policy regarding OBD requirements. The guidance letter states:

"For dual fueled vehicles, the original equipment manufacturer (OEM) OBD system must remain completely functional when operating on the fuel on which the vehicle was originally certified. Operation on alternative fuels must not falsely register diagnostic trouble codes or illuminate a malfunction indicator light (MIL). Dedicated alternative fueled vehicles and dual fuel conversions operating on the alternative fuel must have functional OBD II systems beginning with 2005 MY light duty vehicles and trucks."

It is important that aftermarket alternative fuels converters correctly interpret the last sentence in §86.1806-05(i), which states:

"At a minimum, alternate fuel vehicles shall be equipped with an OBD system meeting OBD requirements to the extent feasible as approved by the Administrator."

The wording "... to the extent feasible...", are referenced in the preamble language from 65 Federal Register 59918, dated October 6, 2000. In the preamble EPA the words "... to the extent feasible ..." apply only to the criteria for issuing wavers (emphasis added). The preamble states that wavers from full OBD II compliance are to be based upon "..... technological infeasibility, not resource reasons." Wavers from OBD II compliance for manufacturers of alternative fueled vehicles officially expired with the end of the 2004 model year for light-duty vehicles and trucks. Wavers from compliance with OBD II requirements for heavy-duty vehicles expire with the end of the 2006 model year.

EPA's requirements for receiving a federal approval of an OBD II system are similar to, but not identical to what the California Air Resources Board (CARB) is requiring when they approve the OBD II system for a 50 state certificate of conformity. One significant difference between California and EPA's approval process is that EPA does not impose fees for deficiencies while CARB does.

Discussion

Fully functional OBD II systems are part of the requirements for obtaining a certificate of conformity. The basic purpose of the OBD II system is to illuminate the malfunction indicator lamp (MIL) when required and assist service repair mechanics in diagnosing and repairing the vehicle. EPA has provided considerable time for manufacturers of alternative fuel systems to comply with the regulatory requirements for OBD II. EPA's requirements for vehicles operating on alternative fuels were most recently published in the Federal Register on October 6, 2000. The regulations published at 40 CFR §86.1806-05 allowed manufacturers of alternative fuel systems for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles until the 2005 model year to produce fully functional OBD II systems. Prior to model year 2005, EPA allowed aftermarket alternative fuel converters to certify vehicles with a desensitized OBD II system during vehicle operation on the alternative fuel. Additionally, in the last two years EPA staff have appeared at three technical forums and each time have stated the need to comply with OBD II requirements for aftermarket alternative fuels conversions.

By holding aftermarket alternative fuels converters to the same regulatory requirements that OEMs meet, EPA is maintaining compliance equity among manufacturers. In fact, converters already have regulatory relief in the form of an exemption from the OEM requirements to conduct durability and in-use verification testing. Having a fully functional OBD system provides EPA with some assurance that alternate fuel converted vehicles have durable emission components and are complying in use. In addition, it is important for alternate fuel converted vehicles to have fully functional OBD II systems in order to allow states with inspection/maintenance programs which rely solely on monitoring the OBD II system to be able to assess the performance of the emission control system on the aftermarket conversions at the

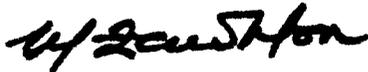
time of inspection.

EPA OBD II Policy for Aftermarket Alternative Fuels Conversions

- EPA will accept a CARB approval of the OBD II system for an aftermarket fuels conversion. However, a federal approval of the OBD II system does not imply that CARB would also approve the OBD II system should the fuels converter wish to sell vehicles in California, or in states which have adopted California emission standards.
- Waivers from complying with the OBD II requirements in §86.1806-05 are no longer applicable effective with the aftermarket fuels conversions of 2005 and later model year light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles. Waivers continue to apply to aftermarket fuels conversions through the 2006 MY for chassis certified heavy-duty vehicles.
- Federal OBD II approval will be based on EPA analysis of the fuels converter's OBD II system. The application for certification must include the documentation specified in paragraphs §86.1844-01(d)(9)(i), (ii), and (iii). Those paragraphs are re-stated below:
 - (i) A description of the functional operation characteristics of the diagnostic system;
 - (ii) The general method of detecting malfunctions for each emission-related powertrain component;
 - (iii) Any deficiencies, including resolution plans and schedules.
- EPA will permit deficiencies but there must be a schedule for resolution and a demonstration that progress has been made in resolving deficiencies.
- There must be no false MIL illumination when operating on the alternative fuel, or on the fuel used by the OEM to obtain the original certificate if the vehicle is converted to dual fuel operation.
- All recommended practices from the Society of Automotive Engineers (SAE) and the International Organization for Standardization (ISO) referenced in EPA's OBD regulations are required to be followed in order to gain OBD approval, including the requirements for a single 16 pin OBD diagnostic link connector and five character alpha-numeric diagnostic trouble codes.
- EPA may request some aftermarket fuels converters to submit a vehicle for EPA inspection, at which time EPA may check for the detection of any of the malfunctions listed in §86.1806-05, such as electrical continuity, misfire detection, oxygen sensor malfunction, and fuel control system problems resulting in emission increases of more than 1.5 times the applicable standards. Interrogation of the OBD II system will be done with a generic scan tool using current SAE data transfer protocols.

If you have questions concerning this letter please contact Martin Reineman at 734-214-4430, or by e-mail at reineman.martin@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Merrylin Zaw-Mon". The signature is written in a cursive, flowing style.

Merrylin Zaw-Mon, Director
Certification and Compliance Division
Office of Transportation and Air Quality