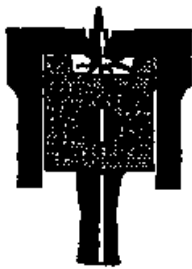


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December 16, 1994

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A-92-14 VI-B

Subject: Certification of NGV Conversion KH

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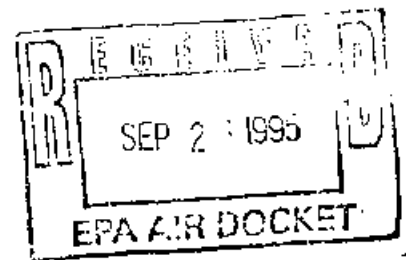
Pages to follow: 7

Messages

Attached, per your request, is the outline proposal we would like to discuss at the meeting between you and the NGV Coalition on the 22nd.

Best regards,

Christopher S. Weaver, P.E.
President



CERTIFICATION OF NGV CONVERSION KITS

**Presented to
The U.S. Environmental Protection Agency
Office of Mobile Sources
Ann Arbor, MI**

December 22, 1994

**by
The Natural Gas Vehicle Coalition**

CERTIFICATION OF AFTERMARKET NGV CONVERSION SYSTEMS (KITS)

ISSUES

- 1. Durability demonstration/mileage accumulation**
- 2. Small manufacturer limit**
- 3. Certification fee**

PREMISES

- With properly-engineered, modern conversion kits, converting gasoline vehicles to natural gas greatly reduces NMHC and CO emissions, and slightly reduces NOx. NGV conversions also help pave the way for OEM NGVs, which are even cleaner. EPA policy should seek to foster, rather than hamper, the spread of properly-engineered NGV conversions.
- Like OEM vehicles, vehicles equipped with certified NGV conversion systems ("kits") must meet applicable emissions standards in-use for the useful life of the vehicle when properly maintained. Kits failing to meet this requirement are subject to recall.
- The purpose of the emissions testing and mileage accumulation requirements is to provide EPA with reasonable confidence that the vehicle can meet emissions standards over its useful life.
- The fact that a vehicle exhibits low emissions during mileage accumulation does not guarantee that it will have low emissions in use. Conditions experienced during mileage accumulation are only a subset of those experienced in the real world.
- The ultimate confirmation of vehicle emissions performance is through in-use surveillance. The accompanying threat of recall forces manufacturers to ensure durability and reliability in-use, independent of the demonstrations required during certification.

CERTIFICATION FEES

- To prevent unfair economic impacts on limited-production vehicle lines, certification fees are limited to \$25,000 per engine family, or 2% of total engine family sales, whichever is less.
- EPA staff interpret this as meaning that NGV conversion kit certifiers must pay 2% of the cost of the vehicle plus conversion kit. For a \$20,000 vehicle with a \$4,000 NGV conversion, this amounts to \$400. This is 10% of the total conversion cost, and 40% of the kit builder's gross revenue.
- To avoid unfair economic impacts, certification fees for aftermarket conversions should be limited to 2% of the cost of the conversion hardware.

SMALL MANUFACTURER PROVISIONS

- **NGVC supported EPA's proposal to allow conversion kit suppliers, regardless of size, to use the small manufacturer provisions. These provisions appeared to allow a less-costly certification process, based on assigned DFs rather than mileage accumulation.**
- **Subsequent discussions with EPA staff indicate that they are reluctant to allow us to use assigned DFs, thus eliminating any benefit from the small manufacturer provisions.**
- **Simplified and less-costly certification requirements for aftermarket conversions are needed by all conversion kit suppliers, regardless of production volume. This would include Ford, GM, and Chrysler if they were to produce aftermarket conversions.**
- **Relating aftermarket certification to small manufacturer provisions has led to confusion, and is likely to create opposition by major auto manufacturers.**
- **The NGV Coalition now recommends that EPA adopt specific provisions for certification of aftermarket systems, separate from the small manufacturer provisions, and independent of manufacturer size.**
- **Aftermarket kit suppliers who also supply hardware for new vehicles, and who certify as manufacturer of record should still be able to use small manufacturer provisions for those vehicles.**

RECOMMENDED CRITERIA FOR CERTIFYING AFTERMARKET KITS

1. The system, when new, must enable the vehicle to comply with applicable emission standards.
2. The system must maintain emission performance over the useful life of the vehicle without adjustment.
3. The system must maintain adequate emissions performance in the face of foreseeable variations in altitude, fuel composition, temperature, and other environmental factors.
4. The system must not affect vehicle emissions when operating on gasoline, and must be compatible with the gasoline on-board diagnostic (OBD) system - i.e. it must not disable any diagnostic functions or cause false illumination of the MIL.

Compliance with these criteria can be demonstrated, with reasonable confidence, without requiring 100,000 miles mileage accumulation on each engine family. Requiring mileage accumulation on each family adds enormously to the cost, but does not result in a significant increase in certainty of in-use compliance.

RECOMMENDED CERTIFICATION PROCEDURE FOR AFTERMARKET NGV CONVERSION KITS

The NGV Coalition recommends the following alternative procedure for certification of aftermarket kits fitted to vehicles already certified on gasoline. This procedure would apply regardless of manufacturer size.

1. Demonstrate conversion kit durability. 100,000 mile mileage accumulation, or engineering analysis based on vehicle and/or bench tests to demonstrate that the kit hardware is durable, reliable, and capable of controlling emissions accurately over the vehicle's useful life. Additional testing and analysis would verify emissions control in the face of varying environmental conditions. To be performed once for each kit hardware configuration.
2. Engine family certification. Demonstrate that vehicles of the specified engine family, fitted with the kit, are likely to continue to meet emissions standards over their useful lives.
 - 2.1 Catalyst temperature monitoring. Measure catalyst temperature in critical operating modes a) on gasoline; b) on natural gas, using the final kit calibration.
 - 2.2 Low-mileage data vehicle. Install the kit according to instructions for the specific engine family. Operate 4000 miles, then FTP test (bi-fuel vehicles test on each fuel). Alternatively, carry-across data vehicle results from another, similar engine family.
 - 2.3 Deterioration factor.
 - a) If the OEM catalytic converter is used, and catalyst temperature is no higher on natural gas than gasoline, use the DFs from OEM certification on gasoline.
 - b) If a DF is available for the same kit in an application with similar catalyst and equal or higher catalyst temperature, carry the DF across.
 - c) Otherwise, install bench-aged catalytic converter and retest (bi-fuel vehicles retest on both fuels). DF calculated from emissions change between 4000 mile and bench-aged cat.