

PROPOSED INDUSTRY PROGRAM FOR VOLUNTARY AFTERMARKET CONVERTER CERTIFICATION

This document outlines a proposal for a voluntary program to certify Aftermarket Catalytic Converters for use on out-of-warranty vehicles in states currently operating under the U.S. EPA aftermarket converter policy. The goal of this program is to provide vehicle owners in those states with aftermarket converters that meet emission performance and durability standards equivalent to those required by the state of California and is significantly better than the current EPA requirements.

Summary of Changes

Compared to the current EPA Policy on *Sale and Use of Aftermarket Catalytic Converters* [40CFR Part 85] the proposed program would:

- Sets emission performance standards to the same level as those required by California for new aftermarket catalytic converters.
- Require demonstration testing to follow the protocols similar to those prescribed by CARB in its aftermarket converter program
- Increase emission test life requirement to 50,000 miles (from 25,000 miles).
- Increase emission warranty to 5 years or 50,000 miles (from 25,000 miles).
- Require performance demonstration on a vehicle in the same OE emission tier (LEV, ULEV, etc.) as the intended converter application family.
- Restrict the application of aftermarket converters to those vehicles in emission categories for which technology has been demonstrated.
- Provide for periodic in-field compliance testing of approved aftermarket converters to ensure they matched the original part certification.

Program Steps

1. Manufacturers conduct product testing at independent emission labs
2. Manufacturers will submit certification application, with proposed application list and test program results to independent program administrator.
3. Administrator grants “certification” to parts meeting program requirements
4. Manufacturers market parts as “certified” to voluntary standard
5. Administrator conducts annual field surveillance of certified parts sold to public to ensure quality and compliance

Performance Requirements

Aftermarket Catalytic Converters will be required to meet or exceed the OE full useful life emission standard, in grams per mile, for the vehicle emission class to which they are intended to be used, when aged to the equivalent of 50,000 miles.

Vehicle Applications

Vehicle application will be qualified by OE emission class. Emission class is defined as the combination of vehicle type (passenger car or light truck), emission tier (LEV, ULEV, and Tier Bin levels, etc.) and exhaust configuration (single in-line converter or multiple in-line converters) for that vehicle type within the models years for which the aftermarket part is intended.

Testing Conditions

Sample aftermarket converters will be evaluated in an “aged” condition representing their warranted life limit (50k miles) on a representative test vehicle.

Test Procedures

Manufacturer will demonstrate the performance of the aftermarket converter by conducting two FTP emission tests of a representative sample converter that has been aged to the useful life limit on a representative test vehicle (RTV). Both tests must show emissions at or below the standard.

Manufacturer will select the RTV to perform the emission demonstration. The criteria for selecting the RTV will be based on the vehicle makes and models to be covered by the proposed converter design.

The criteria will include the following items:

- 1) The lowest gram per mile emission standard. (SULEV is lower than ULEV, etc.)
- 2) The highest engine displacement to converter volume ratio. (Engine size divided by total catalyst volume)
- 3) The highest vehicle test weight. (Inertia weight setting for the test dynamometer,)

Representative Test Vehicle:

The representative test vehicle is selected from the proposed vehicle application list that the catalyst manufacturer has compiled for the aftermarket part to be tested. The representative test vehicle selection is based on the following criteria:

- Lowest gram per mile HC Emission Limit
- Lowest gram per mile NOx Emission Limit
- Lowest Catalyst Swept Volume Ratio
- Greatest Test Weight

Each aftermarket converter configuration is evaluated separately. Converter configuration is based on the CARB aftermarket “single” or “dual” converter concept.

“Single” converter configurations are characterized by only one converter “can” in the entire exhaust system or one “can” per engine bank, in the case of a dual exhaust system. In a “single” converter system, exhaust gas passes through only one converter can before exiting out the tailpipe.

“Dual” converter configurations are those where the exhaust gases pass through two or more converter cans in series before exiting the tailpipe. For “dual” configurations, the front can, rear can, and any middle can may not swap positions unless the re-arranged configuration is tested separately.

The selection criteria will be applied to the vehicle application list in the priority order listed above to determine which vehicle model is a suitable representative test vehicle. The method is as follows:

1. Identify the vehicle makes and models having the lowest gram per mile HC emission standard.
2. Reduce the list to those vehicles with the lowest gram per mile NOx emission standard.
3. Narrow the remainder of the list to vehicles with the lowest aftermarket catalyst swept volume ratio (aftermarket catalyst volume divided by engine displacement).
4. Finally, trim the list down to the models with the greatest test weight.

The representative test vehicle will be selected from the resulting list.

If the list contains multiple emission test groups, any of the remaining vehicle test group numbers are suitable for the selection of a representative test vehicle. The manufacturer is required to select the representative test vehicle from the list of suitable vehicle test groups.

OE manufacturers often certify a single test group number for multiple makes, models, and engine displacements. The aftermarket manufacturer may choose from any of the vehicle models configured with an applicable test group number, as long as the selected representative test vehicle has the same catalyst swept volume ratio determined by the selection criteria.

Similarly, an aftermarket manufacturer may revise the vehicle application list for a previously tested catalyst configuration to include additional vehicle models at any time after successful completion of a test program, provided that the vehicles to be added fall under the selection criteria of the original representative test vehicle.

This procedure applies to 1996 or newer gasoline engine chassis certified on-road vehicles with a GVWR 14,500 lbs or less. Engine certified vehicles are excluded. All diesel vehicles, all heavy duty vehicles and all non-road vehicles/engines are excluded.

Vehicle Application List

The manufacturer compiles a vehicle application list for the converter configuration that is being tested. The vehicle application list is the complete list of all vehicle models for which the tested catalyst configuration is cataloged. The vehicle application list includes the following information for each vehicle:

- Vehicle Make
- Vehicle Model
- Vehicle Model Year
- Vehicle Engine Displacement (in liters)
- Vehicle Test Group Number (a.k.a. Engine Family Number or Emission Family Number)
- Vehicle Test Weight (the FTP dynamometer inertia weight setting, a.k.a. ETW, LVW or ALVW)
- Emission Tier (actual tier of the OEM test standard for EPA Certificate of Conformity or CARB EO --TIER1, LEV1 LEV, T2B8, etc.)
- HC Emission Limit (g/mile THC, NMHC, or NMOG ultimate life limit of the vehicle emission tier)
- NOx Emission Limit (g/mile NOx ultimate life standard of the vehicle emission tier)
- Catalyst Volume of the Proposed Aftermarket Part. (liters of catalyst substrate volume specific to the listed vehicle)
- Aftermarket Catalyst Swept Volume Ratio (aftermarket catalyst volume divided by engine displacement)

Catalyst Aging

Catalyst aging is conducted using the CARB-modified RAT A method as detailed in the appendix of the “California Evaluation Procedures for New Aftermarket Catalytic Converters” in the California Code of Regulations.

All passenger cars and any trucks that have a test weight of 3750 pounds or less are evaluated using a test catalyst aged for a minimum of 75 hours.

Trucks with a test weight greater than 3750 pounds must be evaluated separately using test catalyst aged for a minimum of 100 hours

Manufacturers are free to age their catalysts using the CARB-modified RAT-A method for a longer duration if they choose.

Certification Submission Requirements

The manufacturer must submit the following documents and data to the program administrator.

- List of Vehicle Applications to be covered
- Representative Test Vehicle selection strategy methodology and resulting spreadsheet
- Baseline (OE converter equipped) FTP emission tests and MODE6 download for each RTV
- Catalyst description, dimensions and PGM loading
- Catalyst aging report, including aging cycle, time and temperature hysteresis plot
- Aftermarket converter FTP emission tests and MODE6 download for each RTV
- Demonstration of compatibility with OBD system