

Environmental Protection Agency

§ 610.41

of a fuel economy device will be designed to differentiate maintenance effects from the effect of the device. Any maintenance associated with the device operation will be rigidly controlled. If the maintenance appears to be a significant factor in the effectiveness of a device, then it may be necessary to run a control test on vehicles without the device installed where the same maintenance is performed to quantify any incremental effect of that maintenance.

§ 610.34 Special test conditions.

If the Administrator determines that a device may have potentially detrimental effects on the operation of a vehicle when operated in ambient conditions outside the range specified in 40 CFR part 86, or if the device manufacturer claims a fuel economy improvement in such conditions, additional tests may be performed. These tests will determine whether the device will significantly limit the operational usefulness of the vehicle and will assess the claimed fuel economy benefit.

(a) *Extreme temperatures.* As required by the Administrator, tests will be conducted at extreme ambient temperature conditions to determine the effect due to devices (e.g. engine heaters) for which fuel economy improvements at extreme temperatures are made. For other devices it may be necessary to determine whether the cold starting and driving capability of device-equipped vehicles is affected sufficiently to make them dangerous, or whether fuel economy characteristics at extreme temperatures are significantly worse than before the device was installed.

(b) *High altitude.* Devices for which specific claims of improved fuel economy at high altitude are made may be tested using the procedures in subpart D, at altitudes above 4000 feet. For other devices, testing at high altitude may be necessary for determining whether a device will make the vehicle less useful or efficient when operated at various altitudes. The Administrator will determine when such testing is required.

§ 610.35 Driveability and performance tests.

If the Administrator determines that driveability and performance of a vehicle may be adversely affected by the use of a device, a number of automobiles to be determined by the Administrator will be subjected to the driveability and performance tests discussed in §§ 610.62 and 610.63, respectively.

Subpart D—General Vehicle Test Procedures

§ 610.40 General.

Two chassis dynamometer test procedures, the Federal Test Procedure and the Highway Fuel Economy Test will generally be used to evaluate the effectiveness of the devices supplemented by steady state or engine dynamometer tests where warranted. Under unusual circumstances, other test procedures, durability test procedures or special test procedures such as track versions of the City and Highway fuel economy tests may be used. These procedures are described in subparts E and F.

§ 610.41 Test configurations.

(a) In order to measure the effectiveness of a retrofit device at least two, and in some cases, three vehicle configurations defined in § 610.11 will be tested. Each vehicle will be tested at least twice in each configuration, as determined by the Administrator.

(b) The first test configuration is a baseline configuration. In this configuration the baseline or unretrofitted vehicle emissions will be measured.

(c) A second test configuration, an adjusted configuration, may be required at the discretion of the Administrator if a device requires both hardware and engine parameter modifications to achieve the fuel economy improvement. If, in the Administrator's judgment, based on a review of the available information, the combined effects of retrofit hardware installation and parametric adjustment could be substantially duplicated by parametric adjustment alone, then the Administrator may specify a second test, to evaluate such adjustment exclusive of the retrofit hardware.

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(d) The third series of tests, in the retrofitted configuration, will evaluate the full retrofit system installed on the vehicle.

§ 610.42 Fuel economy measurement.

(a) Fuel consumption will be measured by:

- (1) The carbon balance method, or
- (2) Gravimetric or volumetric methods. In the gravimetric and volumetric methods, fuel consumption is determined by weighing the fuel source before and after a test, or by measuring the volume of fuel consumed during a test. Since the distance traveled during the tests is known, the fuel economy, in miles per gallon, can be calculated. Gravimetric and volumetric methods require the use of special test equipment in addition to the emissions measuring equipment.

(b) The carbon balance procedure for measuring fuel consumption relates the carbon products in the exhaust to the amount of fuel burned during the test. This method will be the one used to measure fuel economy unless track or road tests are employed.

(c) Three values of fuel economy will be reported: for city driving ('75 FTP), for highway driving (HFET), and the combined city/highway value calculated according to this equation:

$$\text{MPG}_{\text{combined}} = 1 / \left[\frac{0.55}{\text{MPG}_{\text{city}}} + \frac{0.45}{\text{MPG}_{\text{hwy}}} \right]$$

§ 610.43 Chassis dynamometer procedures.

(a)(1) *1975 Federal Test Procedure.* Vehicle exhaust emissions and fuel economy under urban driving conditions will be measured according to the Federal emission test procedure described in 40 CFR part 86, subpart B, which is known as the 1975 Federal Test Procedure ('75 FTP). However, the following modifications will be employed:

(i) No evaporative emission loss, as specified by 40 CFR part 86 need be measured (with the exception of devices modifying or disconnecting existing evaporative control devices in such a manner as would be expected to adversely affect their evaporative emission control performance).

(ii) Vehicle preconditioning shall consist of operation of the vehicle through one (1) EPA Urban Dynamometer Driving Schedule. This preconditioning must be done at least 12 hours, but no earlier than 36 hours before the emission test.

(iii) While the test fuel must meet the specifications outlined in 40 CFR part 86, fuel conditioning as specified for evaporative emission test procedures is not required.

(b) *Highway Fuel Economy Test.* The test vehicle is fully warmed up at the start of the highway Fuel Economy Test which is ordinarily run immediately following the Federal Emission Test Procedure. The test procedure to be followed for generation of highway fuel economy data is that specified in § 600.111.

(c) *Steady state tests.* Constant speed, road load tests may be conducted to help give insight into operational differences and exhaust emission and fuel economy changes due to a retrofit device. Speeds between 0 (engine idling) and 60 mpg will be investigated, with a time period at each speed long enough to ensure that engine operation has stabilized.

Subpart E—Durability Test Procedures

§ 610.50 Test configurations.

(a) In addition to the tuneup to manufacturer's specifications per § 610.41, all vehicles in the durability fleet will have installed the following new parts: Air, oil, and fuel filters, spark plugs, points, condenser, rotor, distributor cap, PCV valve, and emission control devices such as vacuum control valves and EGR valves.

(b) Vehicles included in the durability fleet will be subjected at zero device-miles to the same test sequence for fuel economy and exhaust emissions as specified in subpart D. Subsequently, they will be tested at 3,000 device-mile intervals, up to and including the final mileage point of 15,000 device-miles. Testing at these mileage points will be performed with the vehicle equipped with the full retrofit system.

(c) After the 15,000-mile test the vehicle will be tuned as necessary and the device adjusted to the manufacturer's