

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.

(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:

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