

for exhaust emission testing of gasoline fueled engines. As an option, manufacturers may use the fuel specified in § 86.1313-94(a) of this chapter for gasoline fueled engines.

(2) Alternative fuels, such as natural gas, propane, and methanol, used for exhaust emission testing and service accumulation of alternative fuel spark-ignition engines must be representative of commercially available alternative fuels.

(i) The manufacturer shall recommend the alternative fuel to be used for certification testing and engine service accumulation in accordance with paragraph (b)(3) of this section.

(ii) The Administrator shall determine the alternative fuel to be used for testing and engine service accumulation, taking into consideration the alternative fuel recommended by the manufacturer.

(3) Other fuels may be used for testing provided:

(i) They are commercially viable;

(ii) Information acceptable to the Administrator is provided to show that only the designated fuel would be used in customer service; and

(iii) Fuel specifications are approved in writing by the Administrator prior to the start of testing.

(c) *Test fuels—service accumulation and aging.* Unleaded gasoline representative of commercial gasoline generally available through retail outlets must be used in service accumulation and aging for gasoline-fueled spark-ignition engines. As an alternative, the certification test fuels specified under paragraph (b) of this section may be used for engine service accumulation and aging. Leaded fuel may not be used during service accumulation or aging.

[60 FR 34598, July 3, 1995, as amended at 64 FR 15243, Mar. 30, 1999]

§ 90.309 Engine intake air temperature measurement.

(a) The measurement location must be within 10 cm of the engine intake system (i.e., the air cleaner, for most engines.)

(b) The temperature measurements must be accurate to within ± 2 °C.

§ 90.310 Engine intake air humidity measurement.

This section refers to engines which are supplied with intake air other than the ambient air in the test cell (i.e., air which has been pumped directly to the engine air intake system). For engines which use ambient test cell air for the engine intake air, the ambient test cell humidity measurement may be used.

(a) *Humidity conditioned air supply.* Air that has had its absolute humidity altered is considered humidity-conditioned air. For this type of intake air supply, the humidity measurements must be made within the intake air supply system and after the humidity conditioning has taken place.

(b) *Unconditioned air supply.* Humidity measurements in unconditioned intake air supply systems must be made in the intake air stream entering the supply system. Alternatively, the humidity measurements can be measured within the intake air supply stream.

§ 90.311 Test conditions.

(a) *General requirements.* (1) Ambient temperature levels encountered by the test engine throughout the test sequence may not be less than 20 °C or more than 30 °C. All engines must be installed on the test bed at their design installation angle to prevent abnormal fuel distribution.

(2) Calculate all volumes and volumetric flow rates at standard conditions for temperature and pressure, and use these conditions consistently throughout all calculations. Standard conditions for temperature and pressure are 25 °C and 101.3 kPa.

(b) *Engine test conditions.* Measure the absolute temperature (designated as T and expressed in Kelvin) of the engine air at the inlet to the engine and the dry atmospheric pressure (designated as p_s and expressed in kPa), and determine the parameter f according to the following provisions for naturally aspirated engines:

$$f = \frac{99}{p_s} \times \left(\frac{T}{298} \right)^{0.7}$$

For a certification test to be recognized as valid, the parameter f shall be