

Environmental Protection Agency

§ 86.1313-94

(i) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (b)(4) of this section.

(ii) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(5) Other fuels may be used for testing and service accumulation provided:

(i) They are commercially available, and

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

(iii) Use of a fuel listed under paragraphs (b)(2) and (b)(3) or (b)(4) of this section would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(6) The specification range of the fuels to be used under paragraphs (b)(2), (b)(3), (b)(4), and (b)(5) of this section shall be reported in accordance with § 86.090-21(b)(3).

(c) Fuels not meeting the specifications set forth in this section may be used only with the advance approval of the Administrator.

(d) *Mixtures of petroleum and methanol fuels for flexible fuel vehicles.* (1) Mixtures of petroleum and methanol fuels used for exhaust and evaporative emission testing and service accumulation for flexible fuel vehicles shall be within the range of fuel mixtures for which the vehicle was designed.

(2) Manufacturer testing and service accumulation may be performed using only those mixtures (mixtures may be different for exhaust testing, evaporative testing, and service accumulation) expected to result in the highest emissions, provided:

(i) The fuels which constitute the mixture will be used in customer service, and

(ii) Information, acceptable to the Administrator, is provided by the manufacturer to show that the designated fuel mixtures would result in the highest emissions, and

(iii) Written approval from the Administrator of the fuel specifications

must be provided prior to the start of testing.

(3) The specification range of the fuels to be used under paragraph (d)(2) of this section shall be reported in accordance with § 86.090-21(b)(3).

[55 FR 34147, Aug. 21, 1990, as amended at 58 FR 21401, Apr. 21, 1993; 62 FR 47125, Sept. 5, 1997]

§ 86.1313-94 Fuel specifications.

(a) *Gasoline fuel.* (1) Gasoline having the specifications listed in table N94-1 will be used by the Administrator in exhaust emission testing. Gasoline having these specifications or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust emission testing, except that the octane specification does not apply.

TABLE N94-1

Item	ASTM	Value
Octane, research, min	D2699	93
Sensitivity, min		7.5
Lead (organic), g/U.S. gal. (g/liter)	D3237	¹ (0.050) ¹ (0.013)
Distillation range:		
IBP, °F (°C)	D86	75-95 (23.9-35)
10 pct. point, °F (°C)	D86	120-135 (48.9- 57.2)
50 pct. point, °F (°C)	D86	200-230 (93.3-110)
90 pct. point, °F (°C)	D86	300-325 (148.9- 162.8)
EP, max. °F (°C)	D86	415 (212.8)
Sulphur, Max., wt. pct	D1266	0.10
Phosphorus, max., g/U.S. gal. (g/liter)	D3231	0.005 (0.0013)
RVP, psi (kPa)	D323	8.0-9.2 (60.0- 63.4)
Hydrocarbon composition:		
Olefins, max. pct	D1319	10
Aromatics, max. pct	D1319	35
Saturates	D1319	(²)

¹ Maximum.
² Remainder.

(2)(i) Unleaded gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation.

(ii) The octane rating of the gasoline used shall not be higher than one Research octane number above the minimum recommended by the manufacturer and have a minimum sensitivity

of 7.5 octane numbers, where sensitivity is defined as the Research octane number minus the Motor octane number.

(iii) The Reid Vapor Pressure of the gasoline used shall be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(3) The specification range of the gasoline to be used under paragraph (a) of this section shall be reported in accordance with § 86.094-21(b)(3).

(b) *Petroleum diesel test fuel.* (1) The petroleum fuels for testing diesel engines employed for testing shall be clean and bright, with pour and cloud points adequate for operability. The petroleum diesel fuel may contain non-metallic additives as follows: Cetane improver, metal deactivator, anti-oxidant, dehazer, antirust, pour depressant, dye, dispersant and biocide. Fuels specified for emissions testing are in-

tended to be representative of commercially available in-use fuels.

(2) Petroleum fuel for diesel engines meeting the specifications in Table N94-2, or substantially equivalent specifications approved by the Administrator, shall be used in exhaust emissions testing. The grade of petroleum fuel used shall be commercially designated as "Type 2-D" grade diesel fuel except that fuel commercially designated as "Type 1-D" grade diesel fuel may be substituted provided that the manufacturer has submitted evidence to the Administrator demonstrating to the Administrator's satisfaction that this fuel will be the predominant in-use fuel. Such evidence could include such things as copies of signed contracts from customers indicating the intent to purchase and use "Type 1-D" grade diesel fuel as the primary fuel for use in the engines or other evidence acceptable to the Administrator.

TABLE N94-2

Item	ASTM	Type 1-D	Type 2-D
Cetane Number	D613	40-54	40-48
Cetane Index	D976	40-54	40-48
Distillation range:			
IBP, °F	D86	330-390	340-400
(°C)		(165.6-198.9)	(171.1-204.4)
10 percent point, °F	D86	370-430	400-460
(°C)	(187.8-221.1)	(204.4-237.8)	
50 percent point, °F	D86	410-480	470-540
(°C)		(210-248.9)	(243.3-282.2)
90 percent point, °F	D86	460-520	560-630
(°C)		(237.8-271.1)	(293.3-332.2)
EP, °F	D86	500-560	610-690
(°C)		(260.0-293.3)	(321.1-365.6)
Gravity, °API	D287	40-44	32-37
Total Sulfur, percent	D2622	0.03-0.05	0.03-0.05
Hydrocarbon composition:			
Aromatics, pct	D1319 or D5186	¹ 8	¹ 7
Paraffins, Naphthenes, Olefins	D1319	(²)	(²)
Flashpoint, °F	D93	120	130
(°C)		(48.9)	(54.4)
(minimum)			
Viscosity, Centistokes	D445	1.6-2.0	2.0-3.2

¹ Minimum.
² Remainder.

(3) Petroleum diesel fuel for diesel engines meeting the specifications in table N94-3, or substantially equivalent specifications approved by the Administrator, shall be used in service accumulation. The grade of petroleum diesel fuel used shall be commercially designated as "Type 2-D" grade diesel fuel except that fuel commercially designated as "Type 1-D" grade diesel fuel

may be substituted provided that the manufacturer has submitted evidence to the Administrator demonstrating to the Administrator's satisfaction that this fuel will be the predominant in-use fuel. Such evidence could include such things as copies of signed contracts from customers indicating the intent to purchase and use "Type 1-D" grade diesel fuel as the primary fuel for use

in the engines or other evidence acceptable to the Administrator.

TABLE N94-3

Item	ASTM	Type 1-D	Type 2-D
Cetane Number	D613	40-56	30-58
Cetane Index	D976	Min. 40	Min. 40
Distillation range:			
90 pct. point °F (°C)	D86	440-530 (226.7-276.7)	540-630 (282.2-332.2)
Gravity °API	D287	39-45	30-42
Total sulfur, min. pct	D2622	0.03-0.05	0.03-0.05
Flashpoint, min. °F (°C)	D93	120 (48.9)	130 54.4
Viscosity, centistokes	D445	1.2-2.2	1.5-4.5

(4) Other petroleum distillate fuels may be used for testing and service accumulation provided:

(i) They are commercially available; and

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

(iii) Use of a fuel listed under paragraphs (b)(2) and (b)(3) of this section would have a detrimental effect on emissions or durability; and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(5) The specification range of the fuels to be used under paragraph (b) of this section shall be reported in accordance with §86.094-21(b)(3).

(c) *Methanol-fuel.* (1) Methanol fuel used for exhaust and evaporative emission testing and in service accumulation of methanol-fueled engines shall be representative of commercially available methanol fuel and shall consist of at least 50 percent methanol by volume.

(i) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation.

(ii) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(2) Other methanol fuels may be used for testing and service accumulation provided:

(i) They are commercially available; and

(ii) Information, acceptable to the Administrator, is provided to show

that only the designated fuel would be used in customer service; and

(iii) Use of a fuel listed under paragraph (b)(4)(c)(1) of this section would have a detrimental effect on emissions or durability; and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(3) The specification range of the fuels to be used under paragraphs (c)(1) and (c)(2) of this section shall be reported in accordance with §86.094-21(b)(3).

(d) *Mixtures of petroleum and methanol fuels for flexible fuel vehicles.* (1) Mixtures of petroleum and methanol fuels used for exhaust emission testing and service accumulation for flexible fuel vehicles shall consist of the methanol and petroleum fuels listed in paragraph (a) or (b) of this section, and shall be within the range of fuel mixtures for which the vehicle was designed, as reported in accordance with §86.94-21. The Administrator may use any fuel mixture within this range for testing.

(2) The fuel mixtures used by the manufacturers shall be sufficient to demonstrate compliance over the full design range, and shall include:

(i) For emission testing:

(A) A petroleum fuel specified in paragraph (a) or paragraph (b) of this section;

(B) A methanol fuel representative of the methanol fuel expected to the found in use.

(ii) For service accumulation, an alternating combination of the fuels specified in paragraphs (a) or (b), and (c) of this section that, based on good

engineering judgement, demonstrates the durability of the emissions control system. The combination shall be selected such that the cumulative volumes of both the methanol fuel and the petroleum fuel used shall be at least 25 percent of the total fuel volume. The fuels shall be or alternated at intervals not to exceed 500 hours.

(iii) Or, other combinations for testing and/or service accumulation which demonstrate compliance with the standards over the entire design range of the vehicle, provided that written approval is obtained from the Administrator prior to the start of testing.

(3) The specification range of the fuels to be used under this paragraph (d) shall be reported in accordance with § 86.094-21.

(e) *Natural gas-fuel.* (1) Natural gas-fuel having the following specifications will be used by the Administrator for exhaust and evaporative emission testing of natural gas-fueled engines:

NATURAL GAS CERTIFICATION FUEL SPECIFICATIONS

Item		ASTM test method No.	Value
Methane	min. mole pct.	D1945	89.0
Ethane	max. mole pct.	D1945	4.5
C ₃ and higher	max. mole pct.	D1945	2.3
C ₆ and higher	max. mole pct.	D1945	0.2
Oxygen	max. mole pct.	D1945	0.6
Inert gases: Sum of CO ₂ and N ₂	max. mole pct.	D1945	4.0
Odorant ¹			

¹ The natural gas at ambient conditions must have a distinctive odor potent enough for its presence to be detected down to a concentration in air of not over 1/5 (one-fifth) of the lower limit of flammability.

(2) Natural gas-fuel representative of commercial natural gas-fuel and which will be generally available through retail outlets shall be used in service accumulation.

(3) Other natural gas-fuels may be used for testing and service accumulation provided:

- (i) They are commercially available;
- (ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service; and
- (iii) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(4) The specification range of the fuels to be used under paragraphs (e)(1) and (e)(2) of this section shall be reported in accordance with § 86.094-21(b)(3).

(f) *Liquefied petroleum gas-fuel.* (1) Liquefied petroleum gas-fuel used for exhaust and evaporative emission testing and in service accumulation shall be commercially available liquefied petroleum gas-fuel.

(i) Manufacturers shall recommend the liquefied petroleum gas-fuel to be used for testing and service accumulation.

(ii) The Administrator shall determine the liquefied petroleum gas-fuel to be used for testing and service accumulation.

(2) Other liquefied petroleum gas-fuels may be used for testing and service accumulation provided:

- (i) They are commercially available;
- (ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service; and
- (iii) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(3) The specification range of the fuels to be used under paragraphs (f)(1) and (f)(2) of this section shall be measured in accordance with ASTM D2163-91 and reported in accordance with § 86.094-21(b)(3).

(g) Fuels not meeting the specifications set forth in this section may be used only with the advance approval of the Administrator.

[59 FR 48528, Sept. 21, 1994, as amended at 60 FR 34371, June 30, 1995; 62 FR 47125, Sept. 5, 1997]

§ 86.1313-98 Fuel specifications.

Section 86.1313-98 includes text that specifies requirements that differ from § 86.1313-94. Where a paragraph in § 86.1313-94 is identical and applicable to § 86.1313-98, this may be indicated by specifying the corresponding paragraph and the statement “[Reserved]. For guidance see § 86.1313-94”.

- (a) through (b)(1) [Reserved]. For guidance see § 86.1313-94.
- (b)(2) Petroleum fuel for diesel engines meeting the specifications in