Fuel property	Limit
RVP, psi	6.7–7.0
Olefins, vol%	4.0–6.0
Total aromatic hydrocarbons (vol%)	22–25
Benzene, vol%	0.8–1.0
Multi-substituted alkyl Aromatic hydrocarbons, vol%	12–14
MTBE, vol %	10.8–11.2
Additives:	See chapter 4 of the California Regulatory Requirements Applicable to the National Low Emission Vehicle Program (October, 1996). These procedures are incorporated by reference (see § 86.1).
Copper corrosion	No. 1.
Gum, washed, mg/100 ml (max)	3.0
Oxidation stability, minutes (min)	1000
Specific gravity	No limit; report to purchaser required.
Heat of combustion	No limit; report to purchaser required.
Carbon, wt%	No limit; report to purchaser required.
Hydrogen, wt%	No limit; report to purchaser required.

(3)(i) Unless otherwise approved by the Administrator, unleaded gasoline representative of commercial gasoline that will be generally available through retail outlets must be used in service accumulation. For model years 2004 and later, and unless otherwise approved by the Administrator, this gasoline must have a minimum sulfur content of 15 ppm. Unless otherwise approved by the Administrator, where the vehicle is to be used for evaporative emission durability demonstration, such fuel must contain ethanol as required by § 86.1824–01(a)(2)(iii). Leaded gasoline must not be used in service accumulation.

(ii) Unless otherwise approved by the Administrator, the octane rating of the gasoline used must be no higher than 1.0 Retail octane number above the lowest octane rating that meets the fuel grade the manufacturer will recommend to the ultimate purchaser for the relevant production vehicles. If the manufacturer recommends a Retail octane number rather than a fuel grade, then the octane rating of the service accumulation gasoline can be no higher than 1.0 Retail octane number above the recommended Retail octane number. The service accumulation gasoline must also 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 must be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(4) The specification range of the gasoline to be used under this paragraph (a) must be reported in accordance with §§ 86.094–21(b)(3) and 86.1844–01.

(b) through (g) [Reserved]. For guidance see § 86.113–94.

[65 FR 6848, Feb. 10, 2000]

§ 86.113–91 Fuel specifications.

(a) *Otto-cycle test fuel.* (1) Gasoline having the following specifications will be used by the Administrator in exhaust and evaporative emission testing of petroleum-fueled Otto-cycle vehicles. Gasoline having the following specification or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust and evaporative testing except that octane specifications do not apply.

Item		ASTM test method No.	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 [2]	°F	D86	75–95
	(°C)		(23.9–35)
10 pct. point	°F	D86	120–135
	(°C)		(48.9–57.2)
50 pct. point	°F	D86	200–230
	(°C)		(93.3–110)
90 pct. point	°F	D86	300–325
	(°C)		(148.9–162.8)
EP, (max.)	°F	D86	415
	(°C)		(212.8)
Sulfur, weight pct.	max.	D1266 ..	0.10
Phosphorus, max.	g/U.S. gal. (g/liter).	D3231 ..	0.005 (0.0013)

Item		ASTM test method No.	Value
RVP[3,4]	psi (kPa)	D323	8.7–9.2 (60.0–63.4)
Hydrocarbon composition:			
Olefins,	max. pct.	D1319	10
Aromatics	max. pct.	D1319	35
Saturates		D1319	([5])

[1] Maximum.
[2] For testing at altitudes above 1,219 m (4,000 ft) the specified range is 75°–105 °F (23.9°–40.6 °C).
[3] For testing which is unrelated to evaporative emission control, the specified range is 8.0–9.2 psi (55.2–63.4 kPa).
[4] For testing at altitudes above 1,219 m (4,000 ft) the specified range is 7.9–9.2 psi (54.5–63.4 kPa).
[5] Remainder.

(2) Unleaded gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation for petroleum-fueled Otto-cycle vehicles. Leaded gasoline will not be used in service accumulation.

(i) The octane rating of the gasoline used shall be no higher than 1.0 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.

(ii) 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) Methanol fuel used for exhaust and evaporative emission testing and in service accumulation of methanol-fueled Otto-cycle vehicles 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 in accordance with paragraph (a)(3) of this section.

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

(4) 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 (a)(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 paragraphs (a)(2), (a)(3), and (a)(4) of this section shall be reported in accordance with § 86.090–21(b)(3).

(b) *Diesel test fuel.* (1) The petroleum fuels employed for testing diesel vehicles shall be clean and bright, with pour and cloud points adequate for operability. The petroleum fuel may contain nonmetallic additives as follows: cetane improver, metal deactivator, antioxidant, dehazer, antirust, pour depressant, dye, dispersant and biocide. Except for the sulfur content of ''Type 2–D'' fuel, fuels specified for emissions testing are intended to be representative of commercially available in-use fuels.

(2) Petroleum fuel for diesel vehicles meeting the following specifications, or substantially equivalent specifications approved by the Administrator, shall be used in exhaust emissions testing. The grade of petroleum fuel recommended by the engine manufacturer, commercially designated as ''Type 2–D'' grade diesel, shall be used.

Item		ASTM test method No.	Type 2–D
Cetane Number		D613	42–50
Distillation range:			
IBP	°F	D86	340–400
	(°C)		(171.1–204.4)
10 pct. point	°F	D86	400–460
	(°C)		(204.4–237.8)
50 pct. point	°F	D86	470–540
	(°C)		(243.3–282.2)
90 pct. point	°F	D86	560–630
	(°C)		(293.3–332.2)
EP	°F	D86	610–690
	(°C)		(321.1–365.6)
Gravity	° API	D287	32–37
Total sulfur	pct.	D2622	0.08–0.12
Hydrocarbon composition:			
Aromatics, min	pct.	D1319	27
Paraffins, Naphthenes, Olefins.		D1319	([1])
Flashpoint, min	°F	D93	130
	(°C)		(54.4)

Item		ASTM test method No.	Type 2–D
Viscosity, centistokes.	.....	D445	2.0–3.2

[1] Remainder.

(3) Petroleum fuel for diesel vehicles meeting the following specifications, or substantially equivalent specifications approved by the Administrator, shall be used in service accumulation. The grade of petroleum diesel fuel recommended by the engine manufacturer, commercially designated as ''Type 2–D'' grade diesel fuel, shall be used.

Item		ASTM test method No.	Type 2–D
Cetane Number	.....	D613	38–58
Distillation range:			
90 pct. point	°F	D86	540–650
	(°C)	.....	(282.2–343.3)
Gravity	°API	D287	30–39
Total sulfur	pct	D2622 ..	0.08–0.12
Flashpoint, min	°F	D93	130
	(°C)	.....	(54.4)
Viscosity	centistokes	D455	1.5–4.5

(4) Methanol fuel used for exhaust and evaporative emission testing and in service accumulation of methanol-fueled diesel vehicles 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 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)(1) of this section shall be reported in accordance with § 86.090–21(b)(3).

[55 FR 34144, Aug. 21, 1990, as amended at 57 FR 19538, May 7, 1992]

§ 86.113–94 Fuel specifications.

(a) *Gasoline fuel.* (1) Gasoline having the following specifications will be used by the Administrator in exhaust and evaporative emission testing of petroleum-fueled Otto-cycle vehicles. Gasoline having the following specification or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust and evaporative testing except that octane specifications do not apply;