better than the data required by paragraphs (b)(4) and (5) of this section.

(c)(1) *Assembling equipment for locomotive testing.* The optical unit of the smokemeter shall be mounted radially to the exhaust duct so that the measurement will be made at right angles to the axis of the exhaust plume. The distance from the optical centerline to the exhaust outlet shall be minimized; in all cases it shall be less than 10 feet. The maximum allowable distance of unducted space upstream of the optical centerline is 18 inches. The full flow of the exhaust stream shall be centered between the source and detector apertures (or windows and lenses) and on the axis of the light beam.

(2) *Assembling equipment for engine testing.* The optical unit of the smokemeter shall be mounted radially to the exhaust duct so that the measurement will be made at right angles to the axis of the exhaust plume. The distance from the optical centerline to the exhaust outlet shall be less than 25 feet. The maximum allowable distance of unducted space upstream of the optical centerline is 18 inches. In-line smokemeters are allowed. The full flow of the exhaust stream shall be centered between the source and detector apertures (or windows and lenses) and on the axis of the light beam.

(d) *Power supply.* Power shall be supplied to the control unit of the smokemeter in time to allow at least 15 minutes for stabilization prior to testing.

§ 92.112 Analytical gases.

(a) Gases for the CO and CO_2 analyzers shall be single blends of CO and CO_2, respectively, using zero grade nitrogen as the diluent.

(b) Gases for the hydrocarbon analyzer shall be single blends of propane using zero grade air as the diluent.

(c) Gases for the methane analyzer shall be single blends of methane using air as the diluent.

(d) Gases for the NO_X analyzer shall be single blends of NO named as NO_X with a maximum NO_2 concentration of 5 percent of the nominal value using zero grade nitrogen as the diluent.

(e) Fuel for the HFID (or FID, as applicable) and the methane analyzer shall be a blend of 40±2 percent hydrogen with the balance being helium. The mixture shall contain less than 1 ppm equivalent carbon response; 98 to 100 percent hydrogen fuel may be used with advance approval of the Administrator.

(f) *Hydrocarbon analyzer burner air.* The concentration of oxygen must be within 1 mole percent of the oxygen concentration of the burner air used in the latest oxygen interference check ($\%O_2I$). If the difference in oxygen concentration is greater than 1 mole percent, then the oxygen interference must be checked and the analyzer adjusted if necessary, to meet the $\%O_2I$ requirements. The burner air must contain less than 2 ppmC hydrocarbon.

(g) The allowable zero gas (air or nitrogen) impurity concentrations shall not exceed 1 ppm equivalent carbon response, 1 ppm carbon monoxide, 0.04 percent (400 ppm) carbon dioxide and 0.1 ppm nitric oxide.

(h)(1) ''Zero-grade air'' includes artificial ''air'' consisting of a blend of nitrogen and oxygen with oxygen concentrations between 18 and 21 mole percent.

(2) Calibration gases shall be accurate to within ±1 percent of NIST gas standards, or other gas standards which have been approved by the Administrator.

(3) Span gases shall be accurate to within ±2 percent of NIST gas standards, or other gas standards which have been approved by the Administrator.

(i) Oxygen interference check gases shall contain propane at a concentration greater than 50 percent of range. The concentration value shall be determined to calibration gas tolerances by chromatographic analysis of total hydrocarbons plus impurities or by dynamic blending. Nitrogen shall be the predominant diluent with the balance being oxygen. Oxygen concentration in the diluent shall be between 20 and 22 percent.

(j) The use of precision blending devices (gas dividers) to obtain the required calibration gas concentrations is acceptable, provided that the blended gases are accurate to within ±1.5 percent of NIST gas standards, or other gas standards which have been approved by the Administrator. This accuracy implies that primary gases used

for blending must be ''named'' to an accuracy of at least ±1 percent, traceable to NIST or other approved gas standards.

§ 92.113 Fuel specifications.

(a) *Diesel test fuel.* (1) The diesel fuels for testing locomotives or locomotive engines designed to operate on diesel fuel shall be clean and bright, with pour and cloud points adequate for operability. The diesel fuel may contain nonmetallic additives as follows: cetane improver, metal deactivator, antioxidant, dehazer, antirust, pour depressant, dye, dispersant, and biocide. The diesel fuel shall also meet the specifications (as determined using methods incorporated by reference at § 92.5) in Table B113–1 of this section, or substantially equivalent specifications approved by the Administrator, as follows:

TABLE B113–1

Item	ASTM	Type 2–D
Cetane Number	D613	40–48
Cetane Index	D976	40–48
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	0.2–0.4
Hydrocarbon composition, pct:		
Aromatics,	D5186	[1] 27
Paraffins, Naphthenes, Olefins.	D1319	([2])
Flashpoint, min.,		
°F	D93–09	130
°C		(54.4)
Viscosity, centistokes	D445–09.	2.0–3.2

[1] Minimum. [2] Remainder.

(2) Other diesel fuels may be used for testing 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 service; and

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

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

(3) The specification of the fuel to be used under paragraphs (a)(1), and (a)(2) of this section shall be reported in accordance with § 92.133.

(b) *Natural gas test fuel (compressed natural gas, liquefied natural gas).* (1) Natural gas-fuel meeting the specifications (as determined using methods incorporated by reference at § 92.5) in Table B113–2 of this section, or substantially similar specifications approved by the Administrator, shall be used in exhaust emissions testing of locomotives or locomotive engines designed to operate on natural gas-fuel, as follows:

TABLE B113–2

Item	Mole pct.	ASTM test method No.	Value
Methane	Min.	D1945	89.0
Ethane	Max.	D1945	4.5
C_3 and higher	Max.	D1945	2.3
C_6 and higher	Max.	D1945	0.2
Oxygen	Max.	D1945	0.6
Inert gases: Sum of CO_2 and N_2—Odorant [1].	Max.	D1945	4.0

[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) Other natural gas-fuels may be used for testing 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) Written approval from the Administrator of the fuel specifications is provided prior to the start of testing.

(3) The specification of the fuel to be used under paragraph (b)(1) or (b)(2) of this section shall be reported in accordance with § 92.133.

(c) *Other fuel types.* (1) For locomotives or locomotive engines which are designed to be capable of using a type of fuel (or mixed fuel) other than diesel fuel, or natural gas fuel (e.g., methanol), and which are expected to use that type of fuel (or mixed fuel) in