

§92.113

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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,	D1319	(²)
Olefins,		
Flashpoint, min.,		
°F	D93	130
°C .....	.....	(54.4)
Viscosity, centistokes	D445 ...	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 ₄ 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

service, a commercially available fuel of that type shall be used for exhaust emission testing. The Administrator shall determine the specifications of the fuel to be used for testing, based on the engine design, the specifications of commercially available fuels, and the recommendation of the manufacturer.

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

§ 92.114 Exhaust gas and particulate sampling and analytical system.

(a) *General.* (1) During emission testing, the engine exhaust is routed through an exhaust duct connected to, or otherwise adjacent to the outlet of the locomotive exhaust system. Emission samples are collected as specified in paragraphs (b) and (c) of this section. Exhaust duct requirements are specified in paragraph (d) of this section.

(2) The systems described in this section are appropriate for use with locomotives or engines employing a single exhaust.

(i) For testing where the locomotive or engine has multiple exhausts all exhaust streams shall be combined into a single stream prior to sampling, except as allowed by paragraph (a)(2)(ii) of this section.

(ii) For locomotive testing where the locomotive has multiple exhaust stacks, proportional samples may be collected from each exhaust outlet instead of ducting the exhaust stacks together, provided that the CO₂ concentrations in each exhaust stream are shown (either prior to testing or during testing) to be within 5 percent of each other at notch 8.

(3) All vents, including analyzer vents, bypass flow, and pressure relief vents of regulators, should be vented in such a manner to avoid endangering personnel in the immediate area.

(4) Additional components, not specified here, such as instruments, valves, solenoids, pumps, switches, and so forth, may be employed to provide additional information and coordinate the functions of the component systems, provided that their use is consistent with good engineering practice. Any variation from the specifications

in this subpart including performance specifications and emission detection methods may be used only with prior approval by the Administrator.

(b) *Raw exhaust sampling for gaseous emissions.* (1)(i) An example of the type of sampling and analytical system which is to be used for gaseous emissions testing under this subpart is shown in Figure B114-1 of this section. All components or parts of components that are wetted by the sample or corrosive calibration gases shall be either chemically cleaned stainless steel or other inert material, for example, polytetrafluoroethylene resin. The use of "gauge savers" or "protectors" with nonreactive diaphragms to reduce dead volumes is permitted. Additional components such as instruments, valves, solenoids, pumps, switches, etc. may be employed to provide additional information and coordinate the functions of the component systems.

(ii) *System components list.* The following is a list of components shown in Figure B114-1 of this section by numeric identifier.

(A) *Filters.* Glass fiber filter paper is permitted for the fine particulate filters (F1, F2, and F3). Optional filter F4 is a coarse filter for large particulates. Filters F3 and F4 are heated filters.

(B) *Flowmeters.* Flowmeters FL1 and FL2 indicate sample flow rates through the CO and CO₂ analyzers. Flowmeters FL3, FL4, FL5, and FL6 indicate bypass flow rates.

(C) *Gauges.* Downstream gauges are required for any system used for testing under this subpart. Upstream gauges may be required under this subpart. Upstream gauges G1 and G2 measure the input to the CO and CO₂ analyzers. Downstream gauges G3 and G4 measure the exit pressure of the CO and CO₂ analyzers. If the normal operating range of the downstream gauges is less than 3 inches of water, then the downstream gauges must be capable of reading both pressure and vacuum. Gauges G3 and G4 are not necessary if the analyzers are vented directly to atmospheric pressure.

(D) *Pressure gauges.* P1 is a bypass pressure gauge; P2, P3, P4, and P5 are for sample or span pressure at inlet to flow control valves.