shows that the simulated loading is representative of in-use operation. Power for accessories necessary to operate the engine (such as fuel pumps) shall be treated as parasitic losses and would not be included in the engine power output for purposes of calculating brake specific emissions.

(v) The engine may be equipped with a production type starter.

(vi) Means of engine cooling shall be used which will maintain the engine operating temperatures (e.g., temperatures of intake air downstream of charge air coolers, oil, water, etc.) at approximately the same temperature as would occur in a locomotive at each test point under the equivalent ambient conditions. In the case of engine intake air after compression and cooling in the charge air cooler(s), the temperature of the air entering the engine shall be within ±5 °F, at each test point, of the typical temperatures occurring in locomotive operations under ambient conditions represented by the test. Auxiliary fan(s) may be used to maintain engine cooling during operation on the dynamometer. Rust inhibitors and lubrication additives may be used, up to the levels recommended by the additive manufacturer. If antifreeze is to be used in the locomotive application, antifreeze mixtures and other coolants typical of those approved for use in the locomotive may be used.

(vii) The provisions of paragraph (b)(1)(i) of this section apply to engine testing using a locomotive alternator/generator instead of a dynamometer.

[63 FR 18998, Apr. 16, 1998, as amended at 70 FR 40454, July 13, 2005]

§ 92.124 Test sequence; general requirements.

(a) *Air temperature.* (1) The temperature of dilution air for the particulate sample dilution tunnel shall comply with the requirements of § 92.114 throughout the test sequence.

(2) For the testing of locomotives and engines, the ambient (test cell or out-of-door) air temperature, the temperature of the engine intake air, and the temperature of the air which provides cooling for the engine charge air cooling system shall be between 45 °F (7 °C) and 105 °F (41 °C) throughout the test sequence. Manufacturers and remanufacturers may test at higher temperatures without approval from the Administrator, but no corrections are allowed for the deviations from test conditions.

(b) For the testing of locomotives and engines, the atmospheric pressure shall be between 31.0 inches Hg and 26.0 inches Hg throughout the test sequence. Manufacturers and remanufacturers may test at lower pressures without approval from the Administrator, but no corrections are allowed for the deviations from test conditions.

(c) No control of humidity is required for ambient air, engine intake air or dilution air.

(d) *Flow restrictions*—(1) *Locomotive testing.* Restrictions to the flow of air into the engine and of exhaust out of the engine shall be those inherent to the locomotive. No adjustments or changes shall be made to these parameters. The temperature of the inlet fuel to the engine shall not exceed 125 °F.

(2) *Engine testing.* (i) Air inlet and exhaust restrictions shall be set to represent the average restrictions which would be seen in use in a representative application.

(ii) Inlet depression and exhaust backpressure shall be set with the engine operating at rated speed and maximum power, i.e., throttle notch 8.

(iii) The locations at which the inlet depression and exhaust backpressure are measured shall be specified by the manufacturer or remanufacturer.

(iv) The settings shall be made during the preconditioning.

(e) Pre-test engine measurements (e.g., idle and throttle notch speeds, fuel flows, etc.), pre-test engine performance checks (e.g., verification of engine power, etc.) and pre-test system calibrations (e.g., inlet and exhaust restrictions, etc.) can be done during engine preconditioning, or at the manufacturer's convenience subject to the requirements of good engineering practice.

(f) The required test sequence is described in Table B124–1 of this section, as follows:

TABLE B124–1

Test sequence for locomotives and locomotive engines

Mode No.	Notch setting	Time in notch	Emissions measured[2]	Power, and fuel consumption measured
Warmup	Notch 8	5 ±1 min	None	None
Warmup	Lowest Idle	15 min maximum (after engine speed reaches lowest idle speed).	None	None
1a	Low Idle[1]	6 min minimum	All	Both
1	Normal Idle	6 min minimum	All	Both
2	Dynamic Brake[1]	6 min minimum	All	Both
3	Notch 1	6 min minimum	All	Both
4	Notch 2	6 min minimum	All	Both
5	Notch 3	6 min minimum	All	Both
6	Notch 4	6 min minimum	All	Both
7	Notch 5	6 min minimum	All	Both
8	Notch 6	6 min minimum	All	Both
9	Notch 7	6 min minimum	All	Both
10	Notch 8	15 min minimum	All	Both

[1] Omit if not so equipped.
[2] The EPA test sequence for locomotives and locomotive engines may be performed once, with gaseous, particulate and smoke measurements performed simultaneously, or it may be performed twice with gaseous, and particulate measurements performed during one test sequence and smoke measurements performed during the other test sequence. The minimum time in notch is three minutes for test sequences in which only smoke is measured.

[63 FR 18998, Apr. 16, 1998, as amended at 70 FR 40454, July 13, 2005]

§ 92.125 Pre-test procedures and preconditioning.

(a) *Locomotive testing.* (1) Determine engine lubricating oil and coolant levels and fill as necessary to manufacturers recommended full levels.

(2) Connect fuel supply system and purge as necessary; determine that the fuel to be used during emission testing is in compliance with the specifications of § 92.113.

(3) Install instrumentation, engine loading equipment and sampling equipment as required.

(4) Operate the engine until it has reached the specified operating temperature.

(b) *Engine testing.* (1) Determine engine lubricating oil level and fill as necessary to manufacturers recommended full level.

(2)(i) Connect fuel supply system and purge as necessary; determine that the fuel to be used during emission testing is in compliance with the specifications of § 92.113.

(ii) Connect engine cooling system.

(3) Install instrumentation, and sampling equipment as required. Couple the engine to the dynamometer or locomotive alternator/generator.

(4) Start cooling system.

(5) Operate the engine until it has reached the specified operating temperature.

(6) Establish that the temperature of intake air entering the engine after compression and cooling in the charge air cooler(s), at each test point, is within ±5 °F of the temperatures which occur in locomotive operations at the ambient temperature represented by the test.

(c) *Both locomotive and engine testing.* (1) Allow a minimum of 30 minutes warm-up in the stand-by or operating mode prior to spanning the analyzers.

(2) Replace or clean filter elements (sampling and analytical systems) as necessary, and then vacuum leak check the system, § 92.118. A pressure leak check is also permitted per § 92.118. Allow the heated sample line, filters, and pumps to reach operating temperature.

(3) Perform the following system checks:

(i) If a stainless steel NO_2 to NO converter is used, purge the converter with air (zero-grade air, room air, or O_2) for a minimum of 30 minutes. The converter must be at operational temperature while purging.

(ii) Check the sample system temperatures (see § 92.114).

(iii) Check the system response time (see § 92.118). System response time