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**Subpart B—Equipment and Analyzers**

**§ 1065.15 Engine testing.**

(a) This part describes the procedures for performing exhaust emission tests on engines that must meet emission standards.

(b) Generally, you must test an engine while operating it on a laboratory dynamometer over a prescribed sequence. (Subpart J of this part describes in-use testing of engines installed in vehicles or equipment.) You need to sample and analyze the exhaust gases generated during engine operation to determine the concentration of the regulated pollutants.

(c) Concentrations are converted into units of grams of pollutant per kilowatt-hour (g/kW-hr) or similar units for comparison to emission standards. If the applicable emission standards are expressed as g/bhp-hr, references in this part to kW should generally be interpreted to mean horsepower.

**§ 1065.20 Limits for test conditions.**

(a) Unless specified elsewhere in this chapter, you may conduct tests to determine compliance with duty-cycle emission standards at ambient temperatures of 20–30° C (68–86° F), ambient pressures of 600–775 mm Hg, and any ambient humidity level.

(b) Follow the standard-setting part for ambient conditions when testing to determine compliance with not-to-exceed or other off-cycle emission standards.

(c) For engine testing in a laboratory, you may heat, cool, and/or dehumidify the dilution air before it enters the CVS.

(d) For engine testing in a laboratory, if the barometric pressure observed while generating the maximum-torque curve changes by more than 25 mm Hg from the value measured when you started mapping, you must remap the engine. Also, to have a valid test, the average barometric pressure observed during the exhaust emission test must be within 25 mm Hg of the average observed during the maximum torque curve generation (see §1065.510).

**§ 1065.101 Overview.**

This subpart describes equipment and analyzers for measuring emissions. Subpart D of this part describes how to calibrate these devices and subpart C of this part defines the accuracy and purity specifications of analytical gases.

**§ 1065.105 Dynamometer and engine equipment specifications.**

(a) The engine dynamometer system must be able to control engine torque and speed simultaneously over the applicable test cycles within the accuracies specified in §1065.530. If your dynamometer cannot meet the accuracy requirements in §1065.530, you must get our approval before using it. For transient testing, issue command set points for engine torque and speed at 5 Hz or greater (10 Hz recommended). Record feedback engine torque and speed at least once every second during the test. In addition to these general requirements, make sure your engine or dynamometer's readout signals for speed and torque meet the following accuracies for all testing:

(1) Engine speed readout must be accurate to within ±2 percent of the absolute standard value. A 60-tooth (or greater) wheel in combination with a common mode rejection frequency counter is considered an absolute standard for engine or dynamometer speed.

(2) Engine flywheel torque readout must meet one of the two following standards for accuracy:

(i) Within ±3 percent of the NIST true value torque (as defined in §1065.315).

(ii) The following accuracies:

If the full-scale torque value is...	Engine flywheel torque readout must be within...
T ≤ 550 ft-lbs. ....	±2.5 ft-lbs. of NIST true value.
550 < T ≤ 1050 ft-lbs. ....	±5.0 ft-lbs. of NIST true value.
T > 1050 ft-lbs.	±10.0 ft-lbs. of NIST true value.

(3) Option: You may use internal dynamometer signals (such as armature current) to measure torque if you can show that the engine flywheel torque