

(3) *Option.* A master load-cell or transfer standard may be used to verify the in-use torque measurement system.

(i) The master load-cell and read out system must be calibrated with weights at each test weight specified in paragraph (b)(1)(i)(A) of this section. The calibration weights must be traceable to within 0.1 percent of NIST weights.

(ii) Warm up the dynamometer following the equipment manufacturer's specifications.

(iii) Attach the master load-cell and loading system.

(iv) Load the dynamometer to a minimum of 6 equally spaced torque values as indicated by the master load-cell for each in-use range used.

(v) The in-use torque measurement must be within 2 percent of the torque measured by the master system for each load used.

(vi) If the in-use torque is not within 2 percent of the master torque, adjust or repair the system. Repeat steps in paragraphs (b)(3)(ii) through (b)(3)(vi) of this section with the adjusted or repaired system.

(4) The dynamometer calibration must be completed within 2 hours from the completion of the dynamometer warm-up.

(d) *Electrical load banks.* Equipment used to measure the electrical power output dissipated by electrical load banks shall be calibrated as frequently as required by § 92.115, using a calibration procedure that is consistent with good engineering practice and approved by the Administrator.

§ 92.117 Gas meter or flow instrumentation calibration, particulate measurement.

(a) Sampling for particulate emissions requires the use of gas meters or flow instrumentation to determine flow through the particulate filters. These instruments shall receive initial and monthly calibrations as follows:

(1)(i) Install a calibration device in series with the instrument. A critical flow orifice, a bellmouth nozzle, or a laminar flow element or an NIST traceable flow calibration device is required as the standard device.

(ii) The flow system should be checked for leaks between the calibra-

tion and sampling meters, including any pumps that may be part of the system, using good engineering practice.

(2) Flow air through the calibration system at the sample flow rate used for particulate testing and at the backpressure which occurs during the sample test.

(3) When the temperature and pressure in the system have stabilized, measure the indicated gas volume over a time period of at least five minutes or until a gas volume of at least ± 1 percent accuracy can be determined by the standard device. Record the stabilized air temperature and pressure upstream of the instrument and as required for the standard device.

(4) Calculate air flow at standard conditions as measured by both the standard device and the instrument(s).

(5) Repeat the procedures of paragraphs (a)(2) through (4) of this section using at least two flow rates which bracket the typical operating range.

(6) If the air flow at standard conditions measured by the instrument differs by ± 1.0 percent of the maximum operating range or ± 2.0 percent of the point (whichever is smaller), then a correction shall be made by either of the following two methods:

(i) Mechanically adjust the instrument so that it agrees with the calibration measurement at the specified flow rates using the criteria of paragraph (a)(6) of this section; or

(ii) Develop a continuous best fit calibration curve for the instrument (as a function of the calibration device flow measurement) from the calibration points to determine corrected flow. The points on the calibration curve relative to the calibration device measurements must be within ± 1.0 percent of the maximum operating range of ± 2.0 percent of the point through the filter.

(b) *Other systems.* A bell prover may be used to calibrate the instrument if the procedure outlined in ANSI B109.1-1992 (incorporated by reference at § 92.5) is used. Prior approval by the Administrator is not required to use the bell prover.