

**§ 86.524-78**

**40 CFR Ch. I (7-1-10 Edition)**

the analyzer is 20 percent of that measured in step 5. There must be at least 10 percent unreacted NO at this point. Record the concentration of residual NO.

(8) Switch the oxides of nitrogen analyzer to the NO<sub>x</sub> mode and measure total NO<sub>x</sub>. Record this value.

(9) Switch off the NO<sub>x</sub> generation but maintain gas flow through the system. The oxides of nitrogen analyzer will indicate the NO<sub>x</sub> in the NO+O<sub>2</sub> mixture. Record this value.

(10) Turn off the NO<sub>x</sub> generator O<sub>2</sub> (or air) supply. The analyzer will now indicate the NO<sub>x</sub> in the original NO in N<sub>2</sub> mixture. This value should be no more than 5 percent above the value indicated in step 4.

(11) Calculate the efficiency of the NO<sub>x</sub> converter by substituting the concentrations obtained into the following equation:

$$\text{Percent Efficiency} = [1 + (a - b)/(c - d)] \times 100$$

where:

- a = concentration obtained in step (8).
- b = concentration obtained in step (9).
- c = concentration obtained in step (6).
- d = concentration obtained in step (7).

If converter efficiency is not greater than 90 percent corrective action will be required.

(b) *Initial and periodic calibration.* Prior to its introduction into service and monthly thereafter, if oxides of nitrogen are measured, the chemiluminescent oxides of nitrogen analyzer shall be calibrated on all normally used instrument ranges. Use the same flow rate as when analyzing samples. Proceed as follows:

(1) Adjust analyzer to optimize performance.

(2) Zero the oxides of nitrogen analyzer with zero grade air or zero grade nitrogen.

(3) Calibrate on each normally used operating range with NO in N<sub>2</sub> calibration gases with nominal concentrations of 50 and 100 percent of that range. Additional calibration points may be generated.

(c) When testing methanol-fueled motorcycles, it may be necessary to clean the analyzer frequently to prevent in-

terference with NO<sub>x</sub> measurements (see EPA/600/S3-88/040).

[42 FR 1137, Jan. 5, 1977, as amended at 52 FR 47870, Dec. 16, 1987; 58 FR 58423, Nov. 1, 1993; 60 FR 34357, June 30, 1995]

**§ 86.524-78 Carbon dioxide analyzer calibration.**

(a) Prior to its introduction into service and monthly thereafter the NDIR carbon dioxide analyzer shall be calibrated:

(1) Follow the manufacturer's instructions for instrument startup and operation. Adjust the analyzer to optimize performance.

(2) Zero the carbon dioxide analyzer with either zero grade air or zero grade nitrogen.

(3) Calibrate on each normally used operating range with carbon dioxide in N<sub>2</sub> calibration gases with nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. Additional calibration points may be generated. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

(b) [Reserved]

**§ 86.526-90 Calibration of other equipment.**

Other test equipment used for testing shall be calibrated as often as required by the manufacturer or as necessary according to good practice. Specific equipment requiring calibration is the gas chromatograph and flame ionization detector used in measuring methanol and the high pressure liquid chromatograph (HPLC) and ultraviolet detector for measuring formaldehyde.

[54 FR 14551, Apr. 11, 1989]

**§ 86.527-90 Test procedures, overview.**

(a) The procedures described in this and subsequent sections are used to determine the conformity of motorcycles with the standards set forth in subpart E of this part.