**Section 276.602 Steady-State Idle Test Equipment Calibration**

All operators of steady-state idle exhaust test gas analyzers shall comply with the following calibration and operating procedures unless alternative procedures have been approved by the Agency:

a) Exhaust gas analyzers shall be warmed up prior to each vehicle inspection, zero check, span check, or calibration. Analyzers shall be considered to be in a warmed-up condition once stabilized zero readings (readings stabilize for one minute within ±2 percent of full scale, low range on all 3 channels) are obtained.

b) The analyzer shall conduct a zero and span check prior to each test. The span check shall include the HC, CO and CO2 channels, and the NO and O2 channels, if present. If zero and/or span drift cause the signal levels to move beyond the adjustment range of the analyzer, it shall lock out from testing.

c) The system shall lock out from testing if sample flow falls below 3 percent of full scale, or causes system response time to exceed 13 seconds to 90 percent of a step change in input, whichever is less.

d) A system leak check shall be performed within 24 hours before the test, and may be performed in conjunction with the gas calibration described in subsection (e)(1) of this Section. If a leak check is not performed within 24 hours or if the analyzer fails the leak check, the analyzer shall lock out from testing. The leak check shall be a procedure demonstrated to effectively check the sample hose and probe for leaks and shall be performed in accordance with good engineering practices. An error of more than +2 percent of the reading using low range span gas shall cause the analyzer to lock out from testing and shall require repair of leaks.

e) Gas Calibration

1) Analyzers must undergo a two-point calibration within 72 hours before each test unless changes in barometric pressure are compensated for automatically and statistical process control demonstrates equal or better quality control using different frequencies. Gas calibration shall be accomplished by introducing span gas that meets the requirements of subsection (e)(3) of this Section into the analyzer through the calibration port. If the analyzer reads the span gas within the allowable tolerance range (i.e., the square root sum of the squares of the span gas tolerance described in subsection (e)(3) of this Section and the calibration tolerance, which shall be equal to 2 percent), no adjustment of the analyzer is necessary. The gas calibration procedure shall correct readings that exceed the allowable tolerance range to the center of the allowable tolerance range. The pressure in the sample cell shall be the same with the calibration gas flowing during calibration as with the sample gas flowing during sampling. If the system is not calibrated, or the system fails the calibration check, the analyzer shall lock out from testing.

2) A two point gas calibration procedure shall be followed. The span shall be accomplished at one of the following pairs of span points:

A) Low

300 – ppm propane (HC)

1.0 – percent CO

6.0 – percent CO2

1000 – ppm nitric oxide (if equipped with NO)

High

1200 – ppm propane (HC)

4.0 – percent CO

12.0 – percent CO2

3000 – ppm nitric oxide (if equipped with NO)

B) Low

0 – ppm propane (HC)

0.0 – percent CO

0.0 – percent CO2

0 – ppm nitric oxide (if equipped with NO)

High

600 – ppm propane (HC)

1.6 – percent CO

11.0 – percent CO2

1200 – ppm nitric oxide (if equipped with NO)

3) The span gases used for the gas calibration shall be traceable to NIST standards within two percent and shall be within two percent of the span points specified in subsection (e)(2) of this Section.

f) Other Checks

In addition to the other periodic checks described in this Section, those described in subsections (f)(1) and (f)(2) of this Section shall also be used to verify system performance under the special circumstances described therein.

1) Gas Calibration

A) Each time the analyzer electronic or optical systems are repaired or replaced, a gas calibration shall be performed prior to returning the unit to service.

B) Multi-point calibrations shall be performed every 6 months. The calibration curve is checked at 20 percent, 40 percent, 60 percent, and 80 percent of full scale, and must be adjusted or repaired if the specifications in Section 276.503 are not met.

2) Leak Checks

Each time the sample line integrity is broken, a leak check shall be performed prior to testing.

(Source: Amended at 35 Ill. Reg. 11268, effective June 28, 2011)