§ 90.425 CVS calibration frequency.

Calibrate the CVS positive displacement pump or critical flow venturi following initial installation, major maintenance, or as necessary when indicated by the CVS system verification (described in §90.424(e)).

§ 90.426 Dilute emission sampling calculations—gasoline fueled engines.

(a) The final reported emission test results must be computed by use of the following formula:

\[
A_{WM} = \frac{\sum_{i} (W_i \cdot W_{Fi})}{\sum_{i} (P_i \cdot W_{Fi})} \cdot K_{Hi}
\]

Where:

- \(A_{WM}\) = Final weighted brake-specific mass emission rate for an emission (HC, CO, CO\(_2\), or NO\(_X\)) [g/kW-hr]
- \(W_i\) = Average mass flow rate of an emission (HC, CO, CO\(_2\), NO\(_X\)) from a test engine during mode \(i\) [g/hr]
- \(WF_i\) = Weighting factor for each mode \(i\) as defined in §90.410(a).
- \(P_i\) = Gross average power generated during mode \(i\) [kW], calculated from the following equation,
  \[
P_i = \frac{2\pi \cdot \text{speed} \cdot \text{torque}}{60,000}
\]
  Where:
  - speed = average engine speed measured during mode \(i\) [rev./minute]
  - torque = average engine torque measured during mode \(i\) [N-m]
  - \(K_{Hi}\) = NO\(_X\) humidity correction factor for mode \(i\). This correction factor only affects calculations for NO\(_X\) and is equal to one for all other emissions. \(K_{Hi}\) is also equal to 1 for all two-stroke engines.
- \(DF_i\) = Dilution factor of the dilute exhaust during mode \(i\).
- \(C_{Di}\) = Concentration of the emission (HC, CO, NO\(_X\)) in dilute exhaust extracted from the CVS during mode \(i\) [ppm].
- \(C_{Bi}\) = Concentration of the emission (HC, CO, NO\(_X\)) in the background sample during mode \(i\) [ppm].
  \(C_{Bi}\) and \(C_{Di}\) are corrected to a standard temperature of 20 °C and a standard pressure of 101.3 kPa.

(b) The mass flow rate, \(W_i\) in g/hr, of an emission for mode \(i\) is determined from the following equation:

\[
W_i = Q_i \cdot \text{Density} \left[ \frac{C_{Di}}{10^6} - \frac{C_{Bi}}{10^6} \left( 1 - \frac{1}{DF_i} \right) \right]
\]

Where:

- \(Q_i\) = Volumetric flow rate [m\(^3\)/HR at stp].
- \(\text{Density}\) = Density of a specific emission (Density\(\text{HC}\), Density\(\text{CO}\), Density\(\text{CO\(_2\)}\), Density\(\text{NO\(_X\)}\)) [g/m\(^3\)].
- \(DF_i\) = Dilution factor of the dilute exhaust during mode \(i\).
- \(C_{Di}\) = Concentration of the emission (HC, CO, NO\(_X\)) in dilute exhaust extracted from the CVS during mode \(i\) [ppm].
- \(C_{Bi}\) = Concentration of the emission (HC, CO, NO\(_X\)) in the background sample during mode \(i\) [ppm].
- \(\text{STP}\) = Standard temperature and pressure.

(c) Densities for emissions that are to be measured for this test procedure are:

- Density\(\text{HC}\) = 576.8 g/m\(^3\)
- Density\(\text{NO\(_X\)}\) = 1912 g/m\(^3\)
- Density\(\text{CO}\) = 1164 g/m\(^3\)
- Density\(\text{CO\(_2\)}\) = 1829 g/m\(^3\)

(1) The value of Density\(\text{HC}\) above is calculated based on the assumption that the fuel used has a hydrogen to carbon ratio of 1:1.85. For other fuels