

§ 1065.930

40 CFR Ch. I (7-1-08 Edition)

(g) If you use a gravimetric balance to determine whether an engine meets an applicable PM standard, follow the procedures for PM sample preconditioning and tare weighing as described in §1065.590. Operate the PM-sampling system at its expected flow rates using a bypass.

(h) Verify the amount of contamination in the PEMS HC sampling system as follows:

(1) Select the HC analyzers' ranges for measuring the maximum concentration expected at the HC standard.

(2) Zero the HC analyzers using a zero gas introduced at the analyzer port. When zeroing the FIDs, use the FIDs' burner air that would be used for in-use measurements (generally either ambient air or a portable source of burner air).

(3) Span the HC analyzers using span gas introduced at the analyzer port. When spanning the FIDs, use the FIDs' burner air that would be used in-use (for example, use ambient air or a portable source of burner air).

(4) Overflow zero air at the HC probe or into a fitting between the HC probe and the transfer line.

(5) Measure the HC concentration in the sampling system:

(i) For continuous sampling, record the mean HC concentration as overflow zero air flows.

(ii) For batch sampling, fill the sample medium and record its mean concentration.

(6) Record this value as the initial HC concentration, X_{HCinit} , and use it to correct measured values as described in §1065.660.

(7) If the initial HC concentration exceeds the greater of the following values, determine the source of the contamination and take corrective action, such as purging the system or replacing contaminated portions:

(i) 2% of the flow-weighted mean concentration expected at the standard or measured during testing.

(ii) 2 µmol/mol.

(8) If corrective action does not resolve the deficiency, you use a contaminated HC system if it does not prevent you from demonstrating compliance with the applicable emission standards.

EFFECTIVE DATE NOTE: At 73 FR 37345, June 30, 2008, §1065.925 was amended by revising paragraph (h), effective July 7, 2008. For the convenience of the user, the revised text is set forth as follows:

§ 1065.925 PEMS preparation for field testing.

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(h) Verify the amount of contamination in the PEMS HC sampling system as follows:

(1) Select the HC analyzers' ranges for measuring the maximum concentration expected at the HC standard.

(2) Zero the HC analyzers using a zero gas or ambient air introduced at the analyzer port. When zeroing the FIDs, use the FIDs' burner air that would be used for in-use measurements (generally either ambient air or a portable source of burner air).

(3) Span the HC analyzers using span gas introduced at the analyzer port. When spanning the FIDs, use the FIDs' burner air that would be used in-use (for example, use ambient air or a portable source of burner air).

(4) Overflow zero or ambient air at the HC probe or into a fitting between the HC probe and the transfer line.

(5) Measure the HC concentration in the sampling system:

(i) For continuous sampling, record the mean HC concentration as overflow zero air flows.

(ii) For batch sampling, fill the sample medium and record its mean concentration.

(6) Record this value as the initial HC concentration, X_{HCinit} , and use it to correct measured values as described in §1065.660.

(7) If the initial HC concentration exceeds the greater of the following values, determine the source of the contamination and take corrective action, such as purging the system or replacing contaminated portions:

(i) 2% of the flow-weighted mean concentration expected at the standard or measured during testing.

(ii) 2 µmol/mol.

(8) If corrective action does not resolve the deficiency, you may use a contaminated HC system if it does not prevent you from demonstrating compliance with the applicable emission standards.

§ 1065.930 Engine starting, restarting, and shutdown.

Unless the standard-setting part specifies otherwise, start, restart, and shut down the test engine for field testing as follows:

(a) Start or restart the engine as described in the owners manual.

(b) If the engine does not start after 15 seconds of cranking, stop cranking and determine the reason it failed to

start. However, you may crank the engine longer than 15 seconds, as long as the owners manual or the service-repair manual describes the longer cranking time as normal.

(c) Respond to engine stalling with the following steps:

(1) If the engine stalls during a required warm-up before emission sampling begins, restart the engine and continue warm-up.

(2) If the engine stalls at any other time after emission sampling begins, restart the engine and continue testing.

(d) Shut down and restart the engine according to the manufacturer's specifications, as needed during normal operation in-use, but continue emission sampling until the field test is complete.

§ 1065.935 Emission test sequence for field testing.

(a) Time the start of field testing as follows:

(1) If the standard-setting part requires only hot-stabilized emission measurements, operate the engine in-use until the engine coolant, block, or head absolute temperature is within $\pm 10\%$ of its mean value for the previous 2 min or until an engine thermostat controls engine temperature with coolant or air flow.

(2) If the standard-setting part requires hot-start emission measurements, shut down the engine after at least 2 min at the temperature tolerance specified in paragraph (a)(1) of this section. Start the field test within 20 min of engine shutdown.

(3) If the standard-setting part requires cold-start emission measurements, proceed to the steps specified in paragraph (b) of this section.

(b) Take the following steps before emission sampling begins:

(1) For batch sampling, connect clean storage media, such as evacuated bags or tare-weighed PM sample media.

(2) Operate the PEMS according to the instrument manufacturer's instructions and using good engineering judgment.

(3) Operate PEMS heaters, dilution systems, sample pumps, cooling fans, and the data-collection system.

(4) Pre-heat or pre-cool PEMS heat exchangers in the sampling system to within their tolerances for operating temperatures.

(5) Allow all other PEMS components such as sample lines, filters, and pumps to stabilize at operating temperature.

(6) Verify that no significant vacuum-side leak exists in the PEMS, as described in § 1065.345.

(7) Adjust PEMS flow rates to desired levels, using bypass flow if applicable.

(8) Zero and span all PEMS gas analyzers using NIST-traceable gases that meet the specifications of § 1065.750.

(c) Start testing as follows:

(1) Before the start of the first test interval, zero or re-zero any PEMS electronic integrating devices, as needed.

(2) If the engine is already running and warmed up and starting is not part of field testing, start the field test by simultaneously starting to sample exhaust, record engine and ambient data, and integrate measured values using a PEMS.

(3) If engine starting is part of field testing, start field testing by simultaneously starting to sample from the exhaust system, record engine and ambient data, and integrate measured values using a PEMS. Then start the engine.

(d) Continue the test as follows:

(1) Continue to sample exhaust, record data and integrate measured values throughout normal in-use operation of the engine.

(2) Between each test interval, zero or re-zero any electronic integrating devices, and reset batch storage media, as needed.

(3) The engine may be stopped and started, but continue to sample emissions throughout the entire field test.

(4) Conduct periodic verifications such as zero and span verifications on PEMS gas analyzers, as recommended by the PEMS manufacturer or as indicated by good engineering judgment. Results from these verifications will be used to calculate and correct for drift according to paragraph (g) of this section. Do not include data recorded during verifications in emission calculations.