

specifications as each lab instrument it replaces. For field testing or for testing with PEMS in a laboratory or similar environment, under the provisions of § 1065.905(b), the specifications in the following table apply instead of the specifications in Table 1 of § 1065.205.

(c) *Field-testing ambient effects on PEMS.* We recommend that you use PEMS that are only minimally affected by ambient conditions such as temperature, pressure, humidity, physical orientation, mechanical shock and vibration, electromagnetic radiation, and ambient hydrocarbons. Follow the PEMS manufacturer's instructions for proper installation to isolate PEMS from ambient conditions that affect their performance. If a PEMS is inherently affected by ambient conditions that you cannot control, you may monitor those conditions and adjust the PEMS signals to compensate for the ambient effect. The standard-setting part may also specify the use of one or more field-testing adjustments or measurement allowances that you apply to results or standards to account for ambient effects on PEMS.

(1) *Recording ECM signals.* If your ECM updates a broadcast signal more or less frequently than 1 Hz, process data as follows:

(i) If your ECM updates a broadcast signal more frequently than 1 Hz, use PEMS to sample and record the signal's value more frequently. Calculate and record the 1 Hz mean of the more frequently updated data.

(ii) If your ECM updates a broadcast signal less frequently than 1 Hz, use PEMS to sample and record the signal's value at the most frequent rate. Linearly interpolate between recorded values and record the interpolated values at 1 Hz.

(iii) Optionally, you may use PEMS to electronically filter the ECM signals to meet the rise time and fall time specifications in Table 1 of this section. Record the filtered signal at 1 Hz.

(5) * * *

(iii) * * *

(B) Use a single BSFC value that approximates the BSFC value over a test interval (as defined in subpart K of this part). This value may be a nominal BSFC value for all engine operation determined over one or more laboratory duty cycles, or it may be any other BSFC that you determine. If you use a nominal BSFC, we recommend that you select a value based on the BSFC measured over laboratory duty cycles that best represent the range of engine operation that defines a test interval for field-

testing. You may use the methods of this paragraph (d)(5)(iii)(B) only if it does not adversely affect your ability to demonstrate compliance with applicable standards.

* * * * *

■ 138. Section 1065.920 is amended by revising paragraphs (a), (b)(4)(iii), and (b)(7) introductory text to read as follows:

§ 1065.920 PEMS calibrations and verifications.

(a) *Subsystem calibrations and verifications.* Use all the applicable calibrations and verifications in subpart D of this part, including the linearity verifications in § 1065.307, to calibrate and verify PEMS. Note that a PEMS does not have to meet the system-response specifications of § 1065.308 if it meets the overall verification described in paragraph (b) of this section. This section does not apply to ECM signals.

(b) * * *

(4) * * *

(iii) If the standard-setting part specifies the use of a measurement allowance for field testing, also apply the measurement allowance during calibration using good engineering judgment. If the measurement allowance is normally added to the standard, this means you must subtract the measured PEMS brake-specific emission result.

* * * * *

(7) The PEMS passes this verification if any one of the following are true for each constituent:

* * * * *

■ 139. Section 1065.925 is amended by revising paragraph (h) to read as follows:

§ 1065.925 PEMS preparation for field testing.

* * * * *

(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 $\mu\text{mol/mol}$.

(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.

■ 140. Section 1065.935 is amended by revising paragraphs (e)(1) and (g)(5) to read as follows:

§ 1065.935 Emission test sequence for field testing.

* * * * *

(e) * * *

(1) Continue sampling as needed to get an appropriate amount of emission measurement, according to the standard setting part. If the standard-setting part does not describe when to stop sampling, develop a written protocol before you start testing to establish how you will stop sampling. You may not determine when to stop testing based on emission results.

* * * * *

(g) * * *

(5) Invalidate any test intervals that do not meet the drift criterion in § 1065.550. For NMHC, invalidate any test intervals if the difference between the uncorrected and the corrected brake-specific NMHC emission values are within $\pm 10\%$ of the uncorrected results or the applicable standard, whichever is greater. For test intervals that do meet the drift criterion, correct those test intervals for drift according to § 1065.672 and use the drift corrected results in emissions calculations.

* * * * *

Subpart K—[Amended]

■ 141. Section 1065.1001 is amended by revising the definitions for “Designated Compliance Officer”, “Regression statistics” and “Tolerance” and adding definitions in alphabetical order for “Dilution ratio”, “Measurement allowance”, “Mode”, “NIST-accepted”, “Recommend”, “Uncertainty”, and “Work” to read as follows:

§ 1065.1001 Definitions.

* * * * *

Designated Compliance Officer means the Director, Compliance and Innovative Strategies Division (6405–J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

* * * * *

Dilution ratio (DR) means the amount of diluted exhaust per amount of undiluted exhaust.

* * * * *

Measurement allowance means a specified adjustment in the applicable emission standard or a measured emission value to reflect the relative quality of the measurement. See the

standard-setting part to determine whether any measurement allowances apply for your testing. Measurement allowances generally apply only for field testing and are intended to account for reduced accuracy or precision that result from using field-grade measurement systems.

Mode means one of the following:

- (1) A distinct combination of engine speed and load for steady-state testing.
- (2) A continuous combination of speeds and loads specifying a transition during a ramped-modal test.
- (3) A distinct operator demand setting, such as would occur when testing locomotives or constant-speed engines.

NIST-accepted means relating to a value that has been assigned or named by NIST.

* * * * *

Recommend has the meaning given in § 1065.201.

Regression statistics means any of the regression statistics specified in § 1065.602.

* * * * *

Tolerance means the interval in which at least 95% of a set of recorded

values of a certain quantity must lie. Use the specified recording frequencies and time intervals to determine if a quantity is within the applicable tolerance. The concept of tolerance is intended to address random variability. You may not take advantage of the tolerance specification to incorporate a bias into a measurement.

* * * * *

Uncertainty means uncertainty with respect to NIST-traceability. See the definition of NIST-traceable in this section.

* * * * *

Work has the meaning given in § 1065.110.

* * * * *

■ 142. Section 1065.1005 is amended by revising paragraphs (a) and (g) to read as follows:

§ 1065.1005 Symbols, abbreviations, acronyms, and units of measure.

* * * * *

(a) *Symbols for quantities.* This part uses the following symbols and units of measure for various quantities:

Symbol	Quantity	Unit	Unit symbol	Base SI units
%	percent	0.01	%	10 ⁻²
α	atomic hydrogen to carbon ratio	mole per mole	mol/mol	1
A	area	square meter	m ²	m ²
A ₀	intercept of least squares regression			
A ₁	slope of least squares regression			
β	ratio of diameters	meter per meter	m/m	1
β	atomic oxygen to carbon ratio	mole per mole	mol/mol	1
C [#]	number of carbon atoms in a molecule			
d	Diameter	meter	m	m
DR	dilution ratio	mole per mol	mol/mol	1
ε	error between a quantity and its reference			
e	brake-specific basis	gram per kilowatt hour	g/(kW · h)	g · 3.6 ⁻¹ · 10 ⁶ · m ⁻² · kg · s ²
F	F-test statistic			
f	frequency	hertz	Hz	s ⁻¹
f _n	rotational frequency (shaft)	revolutions per minute	rev/min	2 · pi · 60 ⁻¹ · s ⁻¹
γ	ratio of specific heats	(joule per kilogram kelvin) per (joule per kilogram kelvin).	(J/(kg · K))/(J/(kg · K)).	1
K	correction factor			1
l	length	meter	m	m
μ	viscosity, dynamic	pascal second	Pa·s	m ⁻¹ · kg · s ⁻¹
M	molar mass ¹	gram per mole	g/mol	10 ⁻³ · kg · mol ⁻¹
m	mass	kilogram	kg	kg
ṁ	mass rate	kilogram per second	kg/s	kg · s ⁻¹
ν	viscosity, kinematic	meter squared per second	m ² /s	m ² · s ⁻¹
N	total number in series			
n	amount of substance	mole	mol	mol
ṅ	amount of substance rate	mole per second	mol/s	mol · s ⁻¹
P	power	kilowatt	kW	10 ³ · m ² · kg · s ⁻³
PF	penetration fraction			
p	pressure	pascal	Pa	m ⁻¹ · kg · s ⁻²
ρ	mass density	kilogram per cubic meter	kg/m ³	kg · m ⁻³
r	ratio of pressures	pascal per pascal	Pa/Pa	1
R ²	coefficient of determination			
Ra	average surface roughness	micrometer	μm	m ⁻⁶
Re [#]	Reynolds number			
RF	response factor			
RH%	relative humidity	0.01	%	10 ⁻²
σ	non-biased standard deviation			
S	Sutherland constant	kelvin	K	K

Symbol	Quantity	Unit	Unit symbol	Base SI units
SEE	standard estimate of error			
T	absolute temperature	kelvin	K	K
T	Celsius temperature	degree Celsius	°C	K-273.15
T	torque (moment of force)	newton meter	N · m	m ² · kg · s ⁻²
t	time	second	s	s
Δt	time interval, period, 1/frequency	second	s	s
V	volume	cubic meter	m ³	m ³
V	volume rate	cubic meter per second	m ³ /s	m ³ · s ⁻¹
W	work	kilowatt hour	kW · h	3.6 · 10 ⁻⁶ · m ² · kg · s ⁻²
w _c	carbon mass concentration	gram per gram	g/g	1
x	amount of substance mole fraction ²	mole per mole	mol/mol	(¹)
\bar{x}	flow-weighted mean concentration	mole per mole	mol/mol	1
y	generic variable			

¹ See paragraph (f)(2) of this section for the values to use for molar masses. Note that in the cases of NO_x and HC, the regulations specify effective molar masses based on assumed speciation rather than actual speciation.

² Note that mole fractions for THC, THCE, NMHC, NMHCE, and NOTHC are expressed on a C1 equivalent basis.

* * * * *

(g) *Other acronyms and abbreviations.*

This part uses the following additional abbreviations and acronyms:

- ASTM American Society for Testing and Materials
- BMD bag mini-diluter
- BSFC brake-specific fuel consumption
- CARB California Air Resources Board
- CFR Code of Federal Regulations
- CFV critical-flow venturi
- CI compression-ignition
- CITT Curb Idle Transmission Torque
- CLD chemiluminescent detector
- CVS constant-volume sampler
- DF deterioration factor
- ECM electronic control module
- EFC electronic flow control
- EGR exhaust gas recirculation
- EPA Environmental Protection Agency
- FEL Family Emission Limit
- FID flame-ionization detector
- IBP initial boiling point
- ISO International Organization for Standardization
- LPG liquefied petroleum gas
- NDIR nondispersive infrared
- NDUV nondispersive ultraviolet

- NIST National Institute for Standards and Technology
- PDP positive-displacement pump
- PEMS portable emission measurement system
- PFD partial-flow dilution
- PMP Polymethylpentene
- pt. a single point at the mean value expected at the standard
- PTFE polytetrafluoroethylene (commonly known as Teflon™)
- RE rounding error
- RMC ramped-modal cycle
- RMS root-mean square
- RTD resistive temperature detector
- SSV subsonic venturi
- SI spark-ignition
- UCL upper confidence limit
- UFM ultrasonic flow meter
- U.S.C. United States Code

■ 143. Section 1065.1010 is revised to read as follows:

§ 1065.1010 Reference materials.

Documents listed in this section have been incorporated by reference into this part. The Director of the Federal Register approved the incorporation by

reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, Air and Radiation Docket and Information Center, 1301 Constitution Ave., NW., Room B102, EPA West Building, Washington, DC 20460 or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(a) *ASTM material.* Table 1 of this section lists material from the American Society for Testing and Materials that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the American Society for Testing and Materials, 100 Barr Harbor Dr., P.O. Box C700, West Conshohocken, PA 19428 or www.astm.com. Table 1 follows:

TABLE 1 OF § 1065.1010.—ASTM MATERIALS

Document No. and name	Part 1065 reference
ASTM D86-07a, Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure	1065.703, 1065.710
ASTM D93-07, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester	1065.703
ASTM D445-06, Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)	1065.703
ASTM D613-05, Standard Test Method for Cetane Number of Diesel Fuel Oil	1065.703
ASTM D910-07, Standard Specification for Aviation Gasolines	1065.701
ASTM D975-07b, Standard Specification for Diesel Fuel Oils	1065.701
ASTM D1267-02 (Reapproved 2007), Standard Test Method for Gage Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas Method)	1065.720
ASTM D1319-03, Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption	1065.710
ASTM D1655-07e01, Standard Specification for Aviation Turbine Fuels	1065.701
ASTM D1837-02a (Reapproved 2007), Standard Test Method for Volatility of Liquefied Petroleum (LP) Gases	1065.720
ASTM D1838-07, Standard Test Method for Copper Strip Corrosion by Liquefied Petroleum (LP) Gases	1065.720
ASTM D1945-03, Standard Test Method for Analysis of Natural Gas by Gas Chromatography	1065.715
ASTM D2158-05, Standard Test Method for Residues in Liquefied Petroleum (LP) Gases	1065.720

TABLE 1 OF § 1065.1010.—ASTM MATERIALS—Continued

Document No. and name	Part 1065 reference
ASTM D2163–05, Standard Test Method for Analysis of Liquefied Petroleum (LP) Gases and Propene Concentrates by Gas Chromatography	1065.720
ASTM D2598–02 (Reapproved 2007), Standard Practice for Calculation of Certain Physical Properties of Liquefied Petroleum (LP) Gases from Compositional Analysis	1065.720
ASTM D2622–07, Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry	1065.703, 1065.710
ASTM D2713–91 (Reapproved 2001), Standard Test Method for Dryness of Propane (Valve Freeze Method)	1065.720
ASTM D2784–06, Standard Test Method for Sulfur in Liquefied Petroleum Gases (Oxy-Hydrogen Burner or Lamp)	1065.720
ASTM D2880–03, Standard Specification for Gas Turbine Fuel Oils	1065.701
ASTM D2986–95a (Reapproved 1999), Standard Practice for Evaluation of Air Assay Media by the Monodisperse DOP (Diocetyl Phthalate) Smoke Test	1065.170
ASTM D3231–07, Standard Test Method for Phosphorus in Gasoline	1065.710
ASTM D3237–06e01, Standard Test Method for Lead in Gasoline By Atomic Absorption Spectroscopy	1065.710
ASTM D4052–96e01 (Reapproved 2002), Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter	1065.703
ASTM D4814–07a, Standard Specification for Automotive Spark-Ignition Engine Fuel	1065.701
ASTM D5186–03, Standard Test Method for Determination of the Aromatic Content and Polynuclear Aromatic Content of Diesel Fuels and Aviation Turbine Fuels By Supercritical Fluid Chromatography	1065.703
ASTM D5191–07, Standard Test Method for Vapor Pressure of Petroleum Products (Mini Method)	1065.710
ASTM D5797–07, Standard Specification for Fuel Methanol (M70–M85) for Automotive Spark-Ignition Engines	1065.701
ASTM D5798–07, Standard Specification for Fuel Ethanol (Ed75–Ed85) for Automotive Spark-Ignition Engines	1065.701
ASTM D6615–06, Standard Specification for Jet B Wide-Cut Aviation Turbine Fuel	1065.701
ASTM D6751–07b, Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels	1065.701
ASTM D6985–04a, Standard Specification for Middle Distillate Fuel Oil—Military Marine Applications	1065.701
ASTM F1471–93 (Reapproved 2001), Standard Test Method for Air Cleaning Performance of a High-Efficiency Particulate Air Filter System	1065.1001

(b) *ISO material*. Table 2 of this section lists material from the International Organization for Standardization that we have incorporated by reference. The first

column lists the number and name of the material. The second column lists the section of this part where we reference it. Anyone may purchase copies of these materials from the

International Organization for Standardization, Case Postale 56, CH–1211 Geneva 20, Switzerland or www.iso.org. Table 2 follows:

TABLE 2 OF § 1065.1010.—ISO MATERIALS

Document No. and name	Part 1065 reference
ISO 2719:2002, Determination of flash point—Pensky-Martens closed cup method	1065.705
ISO 3016:1994, Petroleum products—Determination of pour point	1065.705
ISO 3104:1994/Cor 1:1997, Petroleum products—Transparent and opaque liquids—Determination of kinematic viscosity and calculation of dynamic viscosity	1065.705
ISO 3675:1998, Crude petroleum and liquid petroleum products—Laboratory determination of density—Hydrometer method	1065.705
ISO 3733:1999, Petroleum products and bituminous materials—Determination of water—Distillation method	1065.705
ISO 6245:2001, Petroleum products—Determination of ash	1065.705
ISO 8217:2005, Petroleum products—Fuels (class F)—Specifications of marine fuels	1065.705
ISO 8754:2003, Petroleum products—Determination of sulfur content—Energy-dispersive X-ray fluorescence spectrometry	1065.705
ISO 10307–2:1993, Petroleum products—Total sediment in residual fuel oils—Part 2: Determination using standard procedures for ageing	1065.705
ISO 10370:1993/Cor 1:1996, Petroleum products—Determination of carbon residue—Micro method	1065.705
ISO 10478:1994, Petroleum products—Determination of aluminium and silicon in fuel oils—Inductively coupled plasma emission and atomic absorption spectroscopy methods	1065.705
ISO 12185:1996/Cor 1:2001, Crude petroleum and petroleum products—Determination of density—Oscillating U-tube method	1065.705
ISO 14596:2007, Petroleum products—Determination of sulfur content—Wavelength-dispersive X-ray fluorescence spectrometry ..	1065.705
ISO 14597:1997, Petroleum products—Determination of vanadium and nickel content—Wavelength-dispersive X-ray fluorescence spectrometry	1065.705
ISO 14644–1:1999, Cleanrooms and associated controlled environments	1065.190

(c) *NIST material*. Table 3 of this section lists material from the National Institute of Standards and Technology that we have incorporated by reference. The first column lists the number and

name of the material. The second column lists the section of this part where we reference it. Anyone may purchase copies of these materials from the Government Printing Office,

Washington, DC 20402 or download them free from the Internet at www.nist.gov. Table 3 follows:

TABLE 3 OF § 1065.1010.—NIST MATERIALS

Document No. and name	Part 1065 reference
ISONIST Special Publication 811, 1995 Edition, Guide for the Use of the International System of Units (SI), Barry N. Taylor, Physics Laboratory.	1065.20, 1065.1001, 1065.1005
NIST Technical Note 1297, 1994 Edition, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results, Barry N. Taylor and Chris E. Kuyatt.	1065.1001

(d) *SAE material.* Table 4 of this section lists material from the Society of Automotive Engineering that we have incorporated by reference. The first

column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase

copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096 or www.sae.org. Table 4 follows:

TABLE 4 OF § 1065.1010.—SAE MATERIALS

Document No. and name	Part 1065 reference
"Optimization of Flame Ionization Detector for Determination of Hydrocarbon in Diluted Automotive Exhausts," Reschke Glen D., SAE 770141	1065.360
"Relationships Between Instantaneous and Measured Emissions in Heavy Duty Applications," Ganesan B. and Clark N. N., West Virginia University, SAE 2001-01-3536	1065.309

(e) *California Air Resources Board material.* Table 5 of this section lists material from the California Air Resources Board that we have incorporated by reference. The first

column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may get copies of these materials from the California Air

Resources Board, 9528 Telstar Ave., El Monte, California 91731. Table 5 follows:

TABLE 5 OF § 1065.1010.—CALIFORNIA AIR RESOURCES BOARD MATERIALS

Document No. and name	Part 1065 reference
"California Non-Methane Organic Gas Test Procedures," Amended July 30, 2002, Mobile Source Division, California Air Resources Board	1065.805

(f) *Institute of Petroleum material.* Table 6 of this section lists the Institute of Petroleum standard test methods material from the Energy Institute that we have incorporated by reference. The

first column lists the number and name of the material. The second column lists the section of this part where we reference it. Anyone may purchase copies of these materials from the

Energy Institute, 61 New Cavendish Street, London, W1G 7AR, UK, +44 (0)20 7467 7100 or www.energyinst.org.uk. Table 6 follows:

TABLE 6 OF § 1065.1010.—INSTITUTE OF PETROLEUM MATERIALS

Document No. and name	Part 1065 reference
IP-470, Determination of aluminum, silicon, vanadium, nickel, iron, calcium, zinc, and sodium in residual fuels by atomic absorption spectrometry	1065.705
IP-500, Determination of the phosphorus content of residual fuels by ultra-violet spectrometry	1065.705
IP-501, Determination of aluminum, silicon, vanadium, nickel, iron, sodium, calcium, zinc and phosphorus in residual fuel oil by ashing, fusion and inductively coupled plasma emission spectrometry	1065.705

PART 1068—GENERAL COMPLIANCE PROVISIONS FOR NONROAD PROGRAMS

■ 144. The authority citation for part 1068 continues to read as follows:

Authority: 42 U.S.C. 7401-7671q.

Subpart A—[Amended]

■ 145. Section 1068.1 is revised by adding paragraphs (a)(6) and (a)(7) and revising paragraphs (b)(4) and (b)(6) to read as follows:

§ 1068.1 Does this part apply to me?

(a) * * *

(6) Locomotives and locomotive engines we regulate under 40 CFR part 1033.

(7) Marine compression-ignition engines we regulate under 40 CFR part 1042.

(b) * * *

(4) Locomotives and locomotive engines we regulate under 40 CFR part 92.

* * * * *

(6) Marine diesel engines we regulate under 40 CFR part 89 or 94.

* * * * *

[FR Doc. E8-7999 Filed 5-5-08; 8:45 am]

Editorial Note: FR Doc. E8-7999 was originally published at pages 25098 to 25352 in the issue of Tuesday, May 6, 2008. This document included numerous typographical and other errors that were inadvertently introduced in the printing process. Because

of the number of errors, this document is being republished in its entirety. This republication does not change the effective date of the original document.

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