

Staff's Suggested Changes to Advanced Clean Cars II Proposal

California Environmental Protection Agency
AIR RESOURCES BOARD

Draft PROPOSED 15-Day Changes

CALIFORNIA 2026 AND SUBSEQUENT MODEL CRITERIA POLLUTANT EXHAUST
EMISSION STANDARDS AND TEST PROCEDURES FOR PASSENGER CARS, LIGHT-
DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES

Adopted: [INSERT DATE OF ADOPTION]

[Note: This version is a staff draft, not an authoritative version for this proposed rulemaking, not being proposed for adoption, and not being released for public comment. This is subject to change. Official proposed (15-day) changes and an explanatory notice will be released for public comment at a later date.

Subsections for which no changes are proposed are indicated with “* * * *.”]

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NOTE: This document is incorporated by reference in title 13, California Code of Regulations (CCR), section 1961.4(c). It contains the majority of the requirements necessary for certification of a passenger car, light-duty truck, or medium-duty vehicle for sale in California, in addition to containing the exhaust emission standards and test procedures for these motor vehicles. However, reference is made in these test procedures to other CARB documents that contain additional requirements necessary to complete an application for certification. These other documents are designed to be used in conjunction with this document. They include:

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CALIFORNIA 2026 AND SUBSEQUENT MODEL CRITERIA POLLUTANT EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES

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PART I: GENERAL PROVISIONS FOR CERTIFICATION AND IN-USE VERIFICATION OF EMISSIONS

§ 86.1 Incorporation by Reference. October 25, 2016.

A. General Applicability

1. § 86.1801 Applicability.

1.1. § 86.1801-12. October 25, 2016. Amend as follows:

1.1.1 Delete subparagraph (a). Replace with the following: Except as otherwise indicated, the provisions of this subpart apply to new passenger cars, light-duty trucks, and medium-duty vehicles, including multi-fueled, alternative fueled, hybrid electric, plug-in hybrid electric, and electric vehicles. In cases where a provision applies only to a certain vehicle group based on its model year, vehicle class, motor fuel, engine type, or other distinguishing characteristics, the limited applicability is cited in the appropriate section of this subpart.

1.1.1.1 Subparagraph (1): [No change.]

1.1.1.2 Delete subparagraph (2). Replace with the following: The provisions of this subpart apply for all medium-duty passenger vehicles and for all other medium-duty vehicles.

1.1.1.3 Delete subparagraph (3). Replace with the following:
Incomplete heavy-duty vehicles above 14,000 pounds GVWR and

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complete vehicles above 14,000 pounds GVWR are subject to the standards and incorporated test procedures in title 13, CCR, section 1956.8.

- 1.1.1.4 Subparagraph (4): [No change.]
- 1.1.2 Subparagraph (b): *Relationship to subpart A of this part.* [n/a]
- 1.1.3 Subparagraph (c): *Clean alternative fuel conversions.* [n/a]
- 1.1.4 Delete subparagraph (d). Replace with the following: *Small volume manufacturers.* Special certification procedures are available for any manufacturer whose projected or actual combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line are fewer than 4,500 units based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For manufacturers certifying for the first time in California, model-year production volume shall be based on projected California sales. The small-volume manufacturer's light- and medium-duty vehicle and truck certification procedures are described in 40 CFR § 86.1838, as modified in section Part I, section G.12 of these test procedures.
- 1.1.5 Subparagraph (e): *You.* [n/a]
- 1.1.6 Subparagraph (f): *Vehicle.* [No change.]
- 1.1.7 Subparagraph (g): *Complete and incomplete vehicles.* [No change.]
- 1.1.8 Subparagraph (h): [No change.]
- 1.1.9 Subparagraph (i): [No change.]
- 1.1.10 Subparagraph (j): [n/a]
- 1.1.11 Subparagraph (k): [n/a]

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3. § 86.1802 Section Numbering; Construction.

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- 3.2 In cases where the entire CFR section is incorporated by reference with no modifications, the notation "[No change.]" is used. In cases where there are no changes to the CFR language but there are additional California requirements, the notation "[No change.]" is used and the additional California requirements are then noted in a separate subsection with the

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numbering convention set forth in Part I, section A.3.2, above. For example, Part I, section B.1 incorporates all of the definitions in CFR section 86.1803-01 into these test procedures. Part I, section B.2 establishes additional California definitions for terms that are not included in CFR section 86.1803-01, but are applicable to these test procedures. In addition, Part I, section B.2 redefines terms that are included in CFR section 86.1803-01, if needed, to make the definitions more applicable to California’s regulatory requirements.

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3.5 The notation “Delete” means that the section (including all subsections) does not apply. The notation “Delete; Replace with the following” means to delete the text of that section (and delete all subsections) and replace with language provided.

3.6 The notation “Amend as follows” means that the text set forth in these test procedures has been modified from the text that appears in the incorporated section of the CFR, as noted.

B. Definitions, Acronyms and Abbreviations

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2. California Definitions.

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“**Attestation**” means a statement signed and dated by an individual, who is employed by a manufacturer and authorized to affirm the attested statement on behalf of the manufacturer, certifying under penalty of perjury under the laws of the State of California that the attested statement is true, accurate, and complete.

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C. General Requirements for Certification

1. § 86.1805 Useful Life.

1.1. § 86.1805-17. October 25, 2016. Amend as follows:

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1.1.2 Subparagraph (b): [n/a]

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3. § 86.1807 Vehicle Labeling.

3.1 § 86.1807-01. April 28, 2014. Amend as follows:

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- 3.1.4 Subparagraphs (c)(1)(ii)(A) through (c)(1)(ii)(D): [n/a]
- 3.1.5 Subparagraphs (c)(1)(iii) through (c)(3): [No change.]
- 3.1.6 Subparagraph (d): Delete and replace with: Incomplete medium-duty vehicles shall have the following statement printed prominently on the label required by paragraph (a)(3)(v) of this section: "This vehicle conforms to California regulations applicable to new 20xx model-year (specify ULEV400, ULEV270, ULEV250, ULEV200, ULEV125, ULEV70, ULEV60, ULEV50, ULEV40, SULEV230, SULEV200, SULEV175, SULEV170, SULEV150, SULEV125, SULEV100, SULEV85, SULEV75, SULEV30, SULEV25, SULEV20, or SULEV15, as applicable) medium-duty vehicles when it does not exceed XXX pounds in curb weight, XXX pounds in gross vehicle weight rating, and XXX square feet in frontal area."
- 3.1.6.1 Subparagraphs (d)(1) and (d)(2): [n/a]
- 3.1.7 Subparagraph (e): [No change.]
- 3.1.8 Subparagraph (f): [No change.]
- 3.1.9 Subparagraph (g): Add the following: The manufacturer shall obtain approval from the Executive Officer for all emission control label formats and locations prior to use. If the Executive Officer finds that the information on the label is vague or subject to misinterpretation, or that the location does not comply with these specifications, the Executive Officer may require that the label or its location be modified accordingly. Samples of all actual production emission control labels used within a test group shall be submitted to the Executive Officer within thirty days after the start of production. The Executive Officer may approve alternate label locations or may, upon request, waive or modify the label content requirements provided that the intent of these requirements is met. If the Executive Officer finds any motor vehicle or motor vehicle engine manufacturer using emission control labels which are different from those approved or which do not substantially comply with the

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readability or durability requirements set forth in these labeling requirements, the Executive Officer may invoke title 13, CCR, section 2109.

- 3.1.10 Subparagraph (h): [n/a]
- 3.1.11 Subparagraph (i): [No change.]

3.2 California Labeling Requirements.

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3.2.2 For all model year vehicles (except zero-emission vehicles (ZEVs)), the tune-up label shall also contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

- (a) "CA OBD II" or "OBD Exempt".
- (b) Identification of the Exhaust Emission Control System, including:

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Any other information necessary to identify the Exhaust Emission Control System.

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D. § 86.1810 General standards; increase in emissions; unsafe conditions; waivers

1. § 86.1810-17. February 19, 2015. Amend § 86.1810-17 as follows:

This section applies to model year 2026 and later passenger cars, light-duty trucks, and medium-duty vehicles fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels. Multi-fueled vehicles (including bi-fueled, dual-fueled and flexible-fueled vehicles), including vehicles certifying with carryover data, shall comply with all requirements established when operating on either fuel (or blend of fuels in the case of flexible-fueled vehicles). This section also applies to hybrid electric vehicles. The standards of this subpart apply to both certification and in-use vehicles unless otherwise indicated.

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- 1.3 Subparagraph (f) *Altitude Requirements.* [No change.]

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1.7 **Supplemental FTP General Provisions for California.**

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1.7.4 **"Lean-on-cruise" calibration strategies.** Manufacturers may use "lean-on-cruise" strategies subject to the following specifications:

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b. A "lean-on-cruise" strategy must not be employed during vehicle operation in normal driving conditions, including A/C usage, unless at least one of the following conditions is met: (i) Such strategies are substantially employed during the FTP, US06, or SC03 duty cycle; (ii) Such strategies are demonstrated not to significantly reduce vehicle emission control effectiveness over the operating conditions in which they are employed; (iii) Such strategies are demonstrated to be necessary to protect the vehicle occupants, engine, or emission control hardware.

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2. Measurement of Hydrocarbon Emissions.

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2.3 For vehicles certifying to the SFTP standards set forth in title 13, CCR, section 1961.4(d)(3) or (e)(3), as applicable, hydrocarbon emissions shall be measured in accordance with Part B (Determination of NMHC Emissions by Flame Ionization Detection) of the "California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles". For alcohol-fueled vehicles certifying to the standards in title 13, CCR, section 1961.4(d)(3) or (e)(3), as applicable, "Non-Methane Hydrocarbons" shall mean "Organic Material Non-Methane Hydrocarbon Equivalent."

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G. Procedures for Demonstration of Compliance with Emission Standards

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2. § 86.1828 Emission data vehicle selection

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2.2 **50°F Requirements.**

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2.2.2 The same test group shall not be selected in the succeeding two years unless the manufacturer produces fewer than nine test groups. If the manufacturer produces more than three ULEV400, ULEV270, ULEV250, ULEV200, ULEV125, ULEV70, ULEV60, ULEV50, ULEV40, SULEV230, SULEV200, SULEV175, SULEV170, SULEV150, SULEV125, SULEV100, SULEV85, SULEV75, SULEV30, SULEV25, SULEV20, or SULEV15 test groups per model year, the Executive Officer may request 50°F testing of specific test groups. If the manufacturer provides a list of the ULEV400, ULEV270, ULEV250, ULEV200, ULEV125, ULEV70, ULEV60, ULEV50, ULEV40, SULEV230, SULEV200, SULEV175, SULEV170, SULEV150, SULEV125, SULEV100, SULEV85, SULEV75, SULEV30, SULEV25, SULEV20, or SULEV15 test groups that it will certify for a model year and provides a description of the technologies used on each test group (including the information in Part I, section G.2.2.1), the Executive Officer shall select the test groups subject to 50°F testing within a 30 day period after receiving such a list and description. The Executive Officer may revise the test groups selected after the 30 day period if the information provided by the manufacturer does not accurately reflect the test groups actually certified by the manufacturer.

2.3 **LEV IV PM Requirements.**

2.3.1 **Vehicle Selection.** A manufacturer shall select emission data and/or engineering development vehicles each year from PC or LDT test groups and separate emission data and/or engineering development vehicles from MDV test groups according to the requirements in Part I, section G.3.4. Within each test group, the vehicle configuration shall be selected which is expected to be worst-case for FTP PM exhaust emission compliance on candidate in-use vehicles.

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3. **§ 86.1829 Durability data and emission data testing requirements; waivers.**

3.1 § 86.1829-15. February 19, 2015. Amend as follows:

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- 3.1.2 Subparagraph (c): [No change.]
- 3.1.3 Subparagraph (d): [Delete; see section Part I, section G.3.4 below, except as follows.]
- 3.1.4 Subparagraph (d)(4): [No change.]
- 3.1.5 Subparagraph (e): [Delete. (The provisions of this section that pertain to evaporative testing are contained the "California Evaporative Emission Standards and Test Procedures for 2026 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, and Heavy-Duty Vehicles." The provisions of this section that pertain to refueling testing are contained the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.")]
- 3.1.6 Subparagraph (f): [No change.]
- 3.1.7 Delete subparagraph (g). Replace with the following: For zero-emission vehicles, manufacturers may provide a statement in the application for certification that vehicles comply with all the requirements of this subpart instead of submitting test data. Tailpipe emissions of regulated pollutants from vehicles powered solely by electricity are deemed to be zero.

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3.3 Highway Fuel Economy Test.

The exhaust emissions, including non-methane organic gas emissions, shall be measured from all exhaust emission data vehicles tested in accordance with the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600 Subpart B or 40 CFR § 1066.840, as modified in Part II of these test procedures with the migration provisions of § 600.111-08 introduction). The oxides of nitrogen emissions measured during such tests shall be multiplied by the oxides of nitrogen deterioration factor computed in accordance with 40 CFR § 86.1823 and added to the non-methane organic gas emissions. This sum shall be rounded and compared with the NMOG+NO_x certification level, as required in title 13, CCR, sections 1961.4(d)(5) and (e)(5). All data obtained pursuant to this paragraph shall be reported in accordance with procedures applicable to other exhaust emission data required pursuant to these procedures. In the event that one or more of the manufacturer's emission data vehicles fail the HWFET standard listed title 13, CCR, sections 1961.4(d)(5) or (e)(5), as applicable, the manufacturer may submit to the Executive Officer engineering data or other

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evidence showing that the system is capable of complying with the standard. If the Executive Officer finds, on the basis of an engineering evaluation, that the system can comply with the HWFET standard, he or she may accept the information supplied by the manufacturer in lieu of vehicle test data.

3.4 LEV IV PM Testing Requirements.

For the 2026 and subsequent model years, a manufacturer must submit test data for test groups certifying to the LEV IV PM standards according to the following table. Once a test group has been used to meet the requirements of this Part I, section G.3.4 for a model year, that same test group shall not be selected in the succeeding two model years unless the manufacturer produces fewer than four test groups that are certified to LEV IV PM standards. For all test groups that are certified to LEV IV PM standards for which test data is not submitted, the manufacturer must, in accordance with good engineering practices, attest that such test groups will comply with the applicable LEV IV PM standards.

| Number of Test Groups Certified to LEV IV PM Standards | Number of Test Groups That Must Be Tested to Demonstrate Compliance with LEV IV PM Standards |
|--|--|
| 1 or 2 | All test groups certifying to LEV IV PM standards |
| 3 | 2 |
| 4 or more | 25% of test groups certifying to LEV IV PM standards |

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8. § 86.1834 Allowable maintenance.

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H. Certification, Information and Reporting Requirements.

1. § 86.1841 Compliance with emission standards for the purpose of certification

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1.3 **SFTP.** For vehicles certified to the SFTP standards in title 13, CCR, section 1961.4(d)(3) or (e)(3), as applicable, full useful life shall mean 15 years or 150,000 miles, whichever occurs first.

1.4 **Demonstration of Vehicle Model Equivalency.**

1.4.1 For the purpose of demonstrating compliance with the requirements in title 13, CCR, section 1961.4(c)(5), a California vehicle model is to be treated as equivalent to a federal vehicle model if all of the following characteristics are identical.

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1.4.3 The requirements in Part I, section H.1.4 do not apply in the case of a federally-certified vehicle model that meets the requirements of title 13, CCR, section 1961.4(c)(5)(B).

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3. § 86.1843 General information requirements

3.1 § 86.1843-01. April 28, 2014. [No change.]

3.2 Credit Reporting.

In order to verify the status of a manufacturer's compliance with the fleet average and phase-in requirements in title 13, CCR, sections 1961.4(d) and (e) for a given model year, and in order to confirm the accrual of credits or debits, each manufacturer shall submit an annual report to the Executive Officer which sets forth the production data used to establish compliance, by no later than March 1 of the calendar year following the close of the model year.

4. § 86.1844 Information Requirements: Application for Certification and Submittal of Information Upon Request.

4.1 § 86.1844-01. October 25, 2016. Amend as follows:

4.1.1 All NMOG test results and certification levels and all NOx test results and certification levels must be reported as separate values and as NMOG plus NOx values for the purpose of complying with this Part I, section H.4.

4.1.2 § 86.1844-01 (a) through (c): [No change.]

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4.1.3 Modify § 86.1844-01(d) as follows:

4.1.3.1 Modify subparagraph (d)(7)(i) as follows: For vehicles certified to any LEV IV emission standards, include a comparison of drive-cycle metrics as specified in 40 CFR 1066.425(j) for each drive cycle or test phase, as appropriate.

4.1.3.2 Delete subparagraph (d)(9).

4.1.3.3 Delete subparagraph (d)(11)(iii); Replace with: For vehicles with spark-ignition engines, describe how AECs are designed to comply with the requirements of Part I, section D.1.7. Identify which components need protection through enrichment strategies; describe the temperature limitations for those components; and describe how the enrichment strategy corresponds to those temperature limitations.

4.1.3.4 Delete subparagraph (d)(15)(ii) and replace it with the following: For vehicles with fuel fired heaters, a manufacturer must include the information specified in Part I, section H.4.4.

4.1.4 Modify § 86.1844-01(e) as follows:

4.1.4.1 Add the following requirements to § 86.1844-01(e):

4.1.4.1.1 The information required in sections 2037, 2038 and 2039, title 13, CCR.

4.1.4.1.2 The NMOG/NMHC and/or formaldehyde to NMHC ratios established according to Part I, section I.1.2 of these test procedures.

4.1.4.2 Delete subparagraph (e)(4) and replace it with the following: Final California vehicle sales volumes for each test group, including each ZEV test group, and evaporative/refueling family combination organized in such a way to verify compliance with any applicable implementation schedules. Final sales are not required until the final update to the Part 2 Application at the end of the model year.

4.1.4.2.1 Subparagraphs (e)(4)(i) and (e)(4)(ii): [No change.]

4.1.4.3 Delete § 86.1844-01(e)(7).

4.1.5 Subparagraphs (f) through (i): [No change.]

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I. In-Use Compliance Requirements and Procedures

1. § 86.1845 Manufacturer in-use verification testing requirements.

1.1. § 86.1845-04. October 25, 2016. Amend as follows:

1.1.1 Table S04-06 - California Small Volume Manufacturers and Small Volume Test Groups

| California only test group annual sales ¹ | 1-1,500 | 1,501-4,500 |
|--|-----------|----------------|
| Low Mileage | Voluntary | 0 |
| High Mileage | Voluntary | 2 ² |

¹ Total annual production of groups eligible for testing under small volume sampling plan is capped at a maximum of 4,500 California-only production volume per model year, per large volume manufacturer. All other remaining large volume manufacturers' small volume test groups shall meet the requirements in Table S04-07 below.

² Particulate emissions must be measured for one vehicle per test group that certifies to the LEV IV particulate standards to demonstrate compliance with the applicable FTP standard. The same vehicle must also be tested to demonstrate compliance with the LEV IV SFTP particulate standard in title 13, CCR, section 1961.4(d)(3)(A)1. or (e)(3)(A)1., as applicable.

1.1.2 Table S04-07 - California Large Volume Manufacturers

| California only test groups - annual sales | 4,500-15,000 | 15,001-25,000 | >25,000 |
|--|----------------|----------------|----------------|
| Low Mileage | 2 ¹ | 3 ² | 4 ² |
| High Mileage | 4 ² | 5 ³ | 6 ³ |

¹ Particulate emissions must be measured for one vehicle per test group that certifies to the LEV IV particulate standards to demonstrate compliance with the applicable FTP standard. Each vehicle must also be tested to demonstrate compliance with the LEV IV SFTP particulate standard in title 13, CCR, section 1961.4(d)(3)(A)1. or (e)(3)(A)1., as applicable.

² Particulate emissions must be measured for two vehicles per test group that certifies to the LEV IV particulate standards to demonstrate compliance with the applicable FTP standard. Each vehicle must also be tested to demonstrate compliance with the LEV IV SFTP particulate standard in title 13, CCR, section 1961.4(d)(3)(A)1. or (e)(3)(A)1., as applicable.

³ Particulate emissions must be measured for three vehicles per test group that certifies to the LEV IV particulate standards to demonstrate compliance with the applicable FTP standard. Each vehicle must also be tested to demonstrate compliance

with the LEV IV SFTP particulate standard in section title 13, CCR, section 1961.4(d)(3)(A)1. or (e)(3)(A)1., as applicable.

1.1.3 **High Mileage Testing.** Amend subparagraph (c)(2) of 40 CFR § 86.1845-04 to read as follows: At least one vehicle of each test group certified to the emission standards in title 13, CCR, section 1961.4 (d)(2)(A)1. or (e)(2)(A) must have a minimum odometer mileage of 105,000 miles or 75 percent of full useful life mileage. See 40 CFR § 86.1838-01(c)(2) for small volume manufacturer mileage requirements.

1.1.4 **High Altitude Testing.** Subparagraph (c)(5)(i) of 40 CFR § 86.1845-04: [No change.]

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3. § 86.1847 Manufacturer in-use verification and in-use confirmatory testing; submittal of information and maintenance of records.

3.1. § 86.1847-01. Amend as follows:

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3.1.2 Amend subparagraph (b)(1) of 40 CFR § 86.1847-01 to read: A complete printout of each and every emission test performed, which must include all test results, the date of each test, the full useful life emission standards to which the test group is certified, and the phase mass values for fuel economy, carbon dioxide and each pollutant measured by the Federal Test Procedure and Supplemental Test Procedure as prescribed by subpart B of this part.

3.1.3 Amend subparagraph (f)(1) of 40 CFR § 86.1847-01 to read: A complete printout of each and every emission test performed, which must include all test results, the date of each test, the full useful life emission standards to which the test group is certified, and the phase mass values for fuel economy, carbon dioxide and each pollutant measured by the Federal Test Procedure and Supplemental Test Procedure as prescribed by subpart B of this part.

4. California Provisions: Certification and In-Use testing requirements for chassis certified Medium-Duty Vehicles (MDV) with a Gross Combined Weight Rating (GCWR) greater than 14,000 pounds, using the Moving Average Window (MAW).

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4.1. Test Procedures for Three Binned Moving Average Window (3B-MAW) and Moving Average Window (MAW). Applies to 2027 and subsequent model year diesel and Otto-cycle vehicles.

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4.1.6 At least 50% of non-idle operation during the manufacturer's test shall include towing with a combined vehicle weight with a minimum of 70% GCWR. If a trailer is used to achieve this GCWR, then the trailer must comply with requirements of SAE J2807, Section 4.4.1, Table 1, however the frontal area of the trailer shall not exceed the manufacturer-specified maximum frontal area for towing. For trailers which exceed 24,000 lbs. (10,886 kg), the minimum trailer frontal area is 75 ft² (6.97 m²) but must not exceed the manufacturer-specified maximum frontal area for towing.

4.1.6.1 If based on good engineering judgement the manufacturer chooses to use a trailer not meeting the SAE J2807 specifications, the manufacturer must provide an explanation for why it is using the trailer it selected in addition to the specifications of the alternate trailer as part of the test plan approval process in Part I, section I.4.3. As part of their review and approval of the test plan per Part I, section I.4.3.3, the Executive Officer shall review and approve the trailer for testing upon confirming the manufacturer's explanation and submitted documentation demonstrate the selected trailer is representative of common usage for the vehicle being tested and that a trailer meeting SAE J2807 specifications is not representative of common usage or is otherwise infeasible to use for testing.

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4.1.9 **Valid tests.** If all the valid test conditions in I.4.1.9 are not met, the test is invalid, and retesting must be conducted.

4.1.9.1 **Test start:** emissions sampling (NMHC, CO, NO_x, PM and CO₂), exhaust flowrate parameters, and sampling of relevant OBD parameters, and ambient temperature and humidity shall commence prior to starting the engine. The coolant temperature shall not exceed 86° F (30° C) at the beginning of the test. If the ambient temperature and the coolant temperature exceeds 86° F (30° C) at the start of the test, the test is void and testing shall be

rescheduled. If a manufacturer believes that conditions may be infeasible to meet the cold start requirements (for example, due to ambient temperatures that are too high), the manufacturer may request approval from the Executive Officer to begin the test sampling period without a cold start as part of the test plan approval process described in Part I, section I.4.3.

- 4.1.9.2 This step applies to diesel vehicles: Each bin will be required to have a minimum of 2,400 valid windows. If the 2,400 valid windows in any bin is not achieved, continue with additional testing and if needed testing on additional days to achieve the minimum window requirements for each bin. If testing fulfills the valid window requirements for the low load and the medium/high load bins but does not fulfill the valid window requirements of the idle bin, then the manufacturer may idle the vehicle at the end of the test sampling period for a minimum of forty minutes and a maximum of sixty minutes to satisfy the valid window requirement of the idle bin.
- 4.1.9.3 This step applies to Otto-cycle vehicles: The test will be required to have a minimum of 2,400 valid windows. If 2,400 valid windows are not achieved during the first test sampling period, continue with additional testing and, if needed, testing on additional days to achieve a minimum of 2,400 valid windows.
- 4.1.9.4 For 2027 through 2029 model year vehicles only, the average engine power over the test must be equal to or greater than 10% of the engine's peak power for a valid test. In the event of an invalid test, the manufacturer shall retest the vehicle additional days until a valid test is achieved.

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4.3. Test Plan Approval.

The manufacturer must send test plans for pre-approval by CARB's Executive Officer a minimum of 30 calendar days prior to testing for each vehicle tested. Test plans, notifications, and communications related to this subsection must be sent to: iuvp@arb.ca.gov

- 4.3.1 Test plans must include the following vehicle, engine, OBD/MIL, maintenance, and PEMS system information:

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4.3.2 The manufacturer must identify weather or logistical circumstances making the cold start requirements infeasible for the particular test. If a manufacturer believes that conditions may be infeasible to meet the cold start requirements (for example, due to ambient temperatures that are too high or fleet procedures), the manufacturer may request approval from the Executive Officer to begin the test sampling period without a cold start. The Executive Officer will approve said request if he or she determines that the identified circumstances will not allow the manufacturer to meet the cold start test requirements. In assessing the request, the Executive Officer will reply based on information provided by the manufacturer and his or her engineering judgment.

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4.5. CARB Authority to Test for In-use Compliance.

4.5.1 The Executive Officer is authorized to conduct in-use compliance testing to identify vehicles that fail to conform to the applicable emission standards in this Part I, section I.4 of the MAW in-use test procedures, and to take corrective action against the manufacturers of such vehicles based on the results of this testing. The Executive Officer may conduct testing under any operating conditions where the emission standards apply as reasonably necessary to confirm compliance with any regulatory provision. Such testing imposes no additional responsibilities on the manufacturer and is undertaken solely by CARB for assessing compliance. Testing by the Executive Officer is not subject to the restrictions imposed on manufacturer self-testing under sections I.4.1.4, I.4.1.6, and I.4.1.9.1.

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4.6. Test group selection and MAW in-use program requirements

4.6.1 **§ 86.1905 How does this program work?** November 2, 2010. Amend as follows:

4.6.1.1 References to "engines" shall mean "vehicles". References to "engine families" shall mean "test groups". "Phase 1" and "Phase 2" testing shall mean testing required by Part I, section I.4 of these test procedures.

4.6.1.1 Subparagraph (a)

4.6.1.2.1 Delete subparagraph (a)(1). Replace with: The manufacturer must test in-use vehicles from the test groups CARB

selects. CARB will select up to 25 percent of the manufacturer's test groups in any calendar year, calculated by dividing the number of test groups the manufacturer certified in the model year corresponding to the calendar year by four and rounding to the nearest whole number. If the manufacturer has only three or fewer test groups, CARB will select one test group per calendar year for testing.

4.6.1.2.2 Subparagraph (a)(2): [No change.]

4.6.1.2 Subparagraph (b): [No change.]

4.6.1.3 Subparagraph (c): [n/a]

4.6.1.4 Subparagraphs (d) through (f): [No change.]

4.6.1.2 Delete subparagraph (g). Replace with: For any communication related to this Part I, section I.4.6, contact iuvp@arb.ca.gov.

4.7. MAW Vehicle Selection and Screening

4.7.1 § 86.1908 How must I select and screen my in-use engines? June 14, 2005. Amend as follows:

4.7.1.1 References to "engines" shall mean "vehicles". References to "engine families" shall mean "test groups".

4.7.1.2 Amend subparagraph (a) as follows: Once CARB directs the manufacturer to do testing under these sections, the manufacturer must select test vehicles that meet the following criteria:

4.7.1.2.1 Delete subparagraph (a)(1). Replace with: The vehicles must be representative of the test group. Select vehicles based on relatively high sales, median and higher frontal area/vehicle body size, median to higher tow capable vehicles in the test group.

4.7.1.2.2 Subparagraphs (a)(2) through (a)(5): [No change.]

4.7.1.2.3 Delete subparagraph (a)(6). Replace with the following: The vehicles have not been misfueled. The use of commercially available diesel and biofuel blends that meet California's fuel specifications in title 4, CCR, section 4148, will not be considered misfueled.

4.7.1.2.4 Subparagraphs (a)(7) through (a)(10): [No change.]

4.7.1.3 Delete subparagraph (b). Replace with: The manufacturer must keep any records of a vehicle's maintenance and use history obtained

from the owner or operator, as required by Part I, section I.4.10 of these test procedures. The manufacturer must report the engine's maintenance and use history and information related to the OBD system, as described in Part I, section I.4.9 of these test procedures.

4.7.1.4 Subparagraphs (c) and (d): [No change, except references to § 86.1920 shall mean section Part I, I.4.9 of these test procedures.]

4.8. Vehicle Preparation for MAW In-use Testing

4.8.1 **§ 86.1910 How must I prepare and test my in-use engines?** October 25, 2016. Amend as follows:

4.8.1.1 References to "engines" shall mean "vehicles". References to "engine families" shall mean "test groups".

4.8.1.2 Delete subparagraph (a): [No change, except the reference to §§ 86.094-21(b)(1)(ii) and 86.094-22(e) shall mean 40 CFR § 86.1833-01, the reference to § 86.1925 shall mean Part I, section I.4.10 of these test procedures, and the reference to § 86.1920 (b)(3)(x) shall mean Part I, section I.4.9 of these test procedures.]

4.8.1.3 Subparagraph (b). Amend as follows:

4.8.1.3.1 Subparagraphs (b)(1) and (b)(2): [No change, except references to § 86.1920 shall mean Part I, section I.4.9 of these test procedures.]

4.8.1.3.2 Subparagraph (b)(3). Amend as follows:

4.8.1.3.2.1 Subparagraphs (b)(3)(i) and (b)(3)(ii). [No change, except references to § 86.1912 shall mean Part I, section I.4.4 of these test procedures and references to § 86.1920 shall mean Part I, section I.4.9 of these test procedures.]

4.8.1.3.2.2 Delete subparagraph (b)(3)(iii). Replace with: If three hours of operation have been accumulated prior to the time a MIL is illuminated or trouble code set, stop the test and use the accumulated test results in the vehicle-pass determination as described in Part I, section I.4.4.

4.8.1.3.2.3 Subparagraph (b)(3)(iv): [No change, except references to § 86.1920 shall mean Part I, section I.4.9 of these test procedures.]

4.8.1.4 Subparagraph (c): Use appropriate fuels for testing, as follows:

4.8.1.4.1 Delete subparagraph (c)(1). Replace with: For diesel vehicles, the manufacturer shall use any commercially available diesel fuel that meets the specifications for No. 2-D S15 in ASTM D 975

(incorporated by reference in 40 CFR § 86.1), as required in the calendar year that in-use testing occurs.

4.8.1.4.2 Subparagraph (c)(2): [No change.]

4.8.1.4.3 Subparagraph (c)(3): [n/a]

4.8.1.4.4 Add the following new requirement for gasoline vehicles: For gasoline vehicles, the manufacturer shall use commercially available fuel that meets the following California fuel specifications:

4.8.1.4.4.1 For conventional gasoline vehicles: California Reformulated Gasoline Phase 3 as indicated in title 13, CCR, § 2262.

4.8.1.4.4.2 For flex-fueled gasoline vehicles: E-85 Fuel Ethanol as indicated in title 13, CCR, § 2292.4

4.8.1.4.5 Subparagraph (c)(4) and (c)(5): [No change.]

4.8.1.4.6 Delete subparagraph (c)(6). Replace with: The manufacturer may take fuel samples from test vehicles to ensure that appropriate fuels were used during in-use testing. If a vehicle fails the vehicle-pass criteria and the manufacturer can show through fuel sample testing that an inappropriate fuel was used during the failed test, that particular test may be voided, and then drain the vehicle's fuel tank(s) and refill the tank(s) with the appropriate fuel described in Part I, section I.4.8.1.4 . The manufacturer must report any fuel tests that are the basis of voiding a test in the report under Part I, section I.4.9 of these test procedures.

4.8.1.5 Subparagraph (d): [Delete; See Part I, sections I.4.1 and I.4.2.]

4.8.1.6 Delete subparagraph (e). Replace with: The manufacturer must test the vehicle under conditions reasonably expected to be encountered during normal vehicle operation and use . For the purposes of Part I, section I.4 of these test procedures, normal operation and use would generally include consideration of the vehicle's normal routes and loads (including auxiliary loads such as air conditioning in the cab), normal ambient conditions.

4.8.1.7 Subparagraphs (f) through (i): [n/a]

4.8.1.8 Subparagraph (j): [No change.]

4.9. MAW In-use Reporting

4.9.1 § 86.1920 What in-use testing information must I report to EPA?

October 25, 2016. Amend as follows:

- 4.9.1.1 References to “engines” shall mean “vehicles”. References to “engine families” shall mean “test groups”. References to “EPA” shall mean “CARB”.
- 4.9.1.2 Subparagraph (a): [No change, except replace the address where reports must be sent to with iuvp@arb.ca.gov.]
- 4.9.1.3 Subparagraph (b). Amend as follows:
 - 4.9.1.3.1 Subparagraph (b)(1): [No change.]
 - 4.9.1.3.2 Subparagraph (b)(2): [No change, except the reference to § 86.1908(a) shall mean Part I, section I.4.7 of these test procedures.]
 - 4.9.1.3.3 Subparagraph (b)(3). Amend as follows:
 - 4.9.1.3.3.1 Subparagraph (b)(3)(i): [No change.]
 - 4.9.1.3.3.2 Subparagraph (b)(3)(ii): [n/a]
 - 4.9.1.3.3.3 Subparagraphs (b)(3)(iii) through (b)(3)(v): [No change.]
 - 4.9.1.3.3.4 Delete subparagraph (b)(3)(vi). Replace with: The vehicle's type or application. Also, identify the type of trailer and weight loading.
 - 4.9.1.3.3.5 Subparagraphs (b)(3)(vii) through (b)(3)(x): [No change.]
 - 4.9.1.3.4 Subparagraph (b)(4). Amend as follows:
 - 4.9.1.3.4.1 Subparagraph (b)(4)(i): [No change.]
 - 4.9.1.3.4.2 Delete subparagraph (b)(4)(ii). Replace with: Days of testing, duration of testing, and the total hours of operation.
 - 4.9.1.3.4.3 Subparagraphs (b)(4)(iii): [No change.]
 - 4.9.1.3.4.4 Subparagraph (b)(4)(iv): [No change, except the reference to § 86.1910 (e) shall mean Part I, section I.4.8.1.5 of these test procedures.]
 - 4.9.1.3.4.5 Subparagraph (b)(4)(v): [No change, except the reference to § 86.1908 or § 86.1910 shall mean Part I, section I.4.8.1.3 of these test procedures.]
 - 4.9.1.3.4.6 Subparagraphs (b)(4)(vi) and (b)(4)(vii): [No change.]
 - 4.9.1.3.4.7 Delete subparagraph (b)(4)(viii). Replace with: Total number of windows and the number of windows per bin.

- 4.9.1.3.4.8 Delete subparagraph (b)(4)(ix). Replace with: Describe the method used to determine NMHC as specified in 40 CFR § 1065, subpart J. Report analysis as described in Part I, section I.4.1 of these test procedures.
- 4.9.1.3.4.9 Subparagraph (b)(4)(x): [No change.]
- 4.9.1.3.4.10 Subparagraph (b)(4)(xi): [n/a]
- 4.9.1.3.4.11 Delete subparagraph (b)(4)(xii). Replace with: The manufacturer shall collect at a minimum the following data stream values (if the vehicle is so-equipped) at 1 second intervals (i.e., 1 Hertz) and submit the data in a comma separated value file for each test.
- 4.9.1.3.4.11.1 Subparagraphs (b)(4)(xii)(A) through (b)(4)(xii)(G): [No change.]
- 4.9.1.3.4.11.2 Delete subparagraph (b)(4)(xii)(H). Replace with: Exhaust aftertreatment temperatures
- 4.9.1.3.4.11.3 Subparagraph (b)(4)(xii)(I) and (b)(4)(xii)(N): [No change.]
- 4.9.1.3.4.11.4 Delete subparagraph (b)(4)(xii)(O). Replace with: Any parameter sensed or controlled in order to modulate the emission-control system
- 4.9.1.3.4.11.5 Add the following to the list of required data:
- actual engine torque
 - reference engine maximum torque
 - engine oil temperature
 - fuel rate
 - modeled exhaust flow
 - intake air/manifold temperature
 - air flow rate (from mass air flow sensor)
 - fuel injection timing
 - EGR mass flow rate
 - commanded EGR valve duty cycle/position
 - actual EGR valve duty cycle/position
 - EGR error between actual and commanded
 - boost pressure
 - commanded/target boost pressure
 - PM filter inlet temperature
 - PM filter outlet temperature
 - exhaust gas temperature sensor output
 - variable geometry turbo position

- corrected NOx sensor output.
- DEF dosing mode
- stability of NOx sensor reading
- engine friction – percent torque
- commanded DEF dosing
- DEF usage for current driving cycle
- DEF dosing rate
- charge air cooler outlet temperature
- SCR intake temperature
- SCR outlet temperature
- modeled actual ammonia storage level on SCR
- target ammonia storage level on SCR
- NOx mass emission rate – engine out
- NOx mass emission rate – tailpipe
- Vehicle speed
- Engine run time
- Hydrocarbon doser flow rate

4.9.1.3.4.11.6 For in-use testing, the manufacturer shall additionally collect an OBD scan (i.e., snapshot of data) of all data stream parameters, all service mode data, and all tracked data (i.e., all data required in title 13, CCR sections 1968.2 g(4), g(5), and g(6)) at the beginning of the test sampling period, at any key-off events, and the end of each test sampling period during testing.

4.9.1.3.5 Subparagraph (b)(5): [n/a]

4.9.1.3.6 Subparagraph (b)(6): Amend as follows:

4.9.1.3.6.1 Add the following: For vehicles, identify the in-use thresholds for the 3B-MAW and MAW as described in Part I, section I.4.1 of these test procedures.

4.9.1.3.6.2 Subparagraph (b)(6)(i): [No change, except the reference to § 86.1912(f) shall mean Part I, section I.4.1 of these test procedures.]

4.9.1.3.6.3 Subparagraph (b)(6)(ii): [No change.]

4.9.1.3.6.4 Subparagraph (b)(6)(iii): [No change, except the reference to § 86.1912(f) shall mean Part I, section I.4.1 of these test procedures.]

4.9.1.3.6.5 Delete subparagraph (b)(6)(iv). Replace with: If possible, state the outcome of testing for the test group based on the criteria in Part I, section I.4.4 of these test procedures.

4.9.1.4 Subparagraph (c). Amend as follows:

4.9.1.4.1 Subparagraph (c)(1) through (c)(6): [No change, except the reference to § 86.1912 shall mean Part I, section I.4.1 of these test procedures.]

4.9.1.4.2 Add the following requirement: For gasoline vehicles, show how enrichment operation was determined and used for data exclusion.

4.9.1.5 Subparagraph (d): [No change, except that electronic notifications must be sent to CARB at iuvp@arb.ca.gov, and the reference to § 86.1905 shall mean Part I, section I.4.6 of these test procedures.]

4.9.1.6 Delete subparagraph (e). Replace with: Send CARB an electronic notification at iuvp@arb.ca.gov within 15 days after the manufacturer's initial review of the test data for a selected test group indicates that three vehicles have failed to comply with the vehicle-pass criteria.

4.9.1.7 Subparagraph (f): [No change.]

4.9.1.8 Delete subparagraph (g). Replace with: CARB may require the manufacturer to send more information to evaluate whether the test group meets the requirements of this part, or to help inform potential decisions concerning testing.

4.10. MAW In-use Records

4.10.1 **§ 86.1925 What records must I keep?** June 14, 2005. Amend as follows:

4.10.1.1 References to "engines" shall mean "vehicles". References to "engine families" shall mean "test groups". References to "EPA" shall mean "CARB".

4.10.1.2 Subparagraph (a): [No change.]

4.10.1.3 Subparagraph (b). Amend as follows:

4.10.1.3.1 Subparagraph (b)(1): [No change, except the reference to § 86.1920 shall mean Part I, section I.4.9 of these test procedures.]

4.10.1.3.2 Subparagraph (b)(2). Amend as follows:

4.10.1.3.2.1 Subparagraph (b)(2)(i): [No change, except the reference to § 86.1908 shall mean Part I, section I.4.7 of these test procedures.]

4.10.1.3.2.2 Subparagraph (b)(2)(ii): [No change, except the reference to § 86.1910 shall mean Part I, section I.4.8 of these test procedures.]

4.10.1.3.2.3 Subparagraph (b)(2)(iii): [No change, except the reference to § 86.1920 shall mean Part I, section I.4.9 of these test procedures.]

4.10.1.3.2.4 Subparagraph (b)(2)(iv): [No change, except the reference to § 86.1912 shall mean Part I, section I.4.1 of these test procedures.]

4.10.1.3.3 Subparagraph (c): [No change.]

Appendices I, II, and III to 40 CFR, Part 86, Subpart S [No change.]

J. Procedural Requirements

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13. § 86.1862-04 Maintenance of records and submittal of information relevant to compliance with fleet-average standards. October 25, 2016.

13.1 Amend subparagraph (a) as follows: *Overview.* This section describes reporting and recordkeeping requirements for all vehicles subject to the emission standards in title 13, CCR, sections 1961.4, 1962.4, and 1976.

13.2 Subparagraph (b): [No change.]

13.3 Amend subparagraph (c) as follows:

13.3.1 Subparagraphs (c)(1) through (c)(3): [No change.]

13.3.2 Delete subparagraph (c)(4). Replace with: Unless a manufacturer reports the data required by this section in the annual production report required under § 86.1844-01(e), a manufacturer must submit an annual report for each model year after production ends for all affected vehicles produced by the manufacturer subject to the provisions of this subpart and no later than March 1 of the calendar year following the given model year. Annual reports must be submitted to: Chief, Emissions Certification and Compliance Division, California Air Resources Board, 4001 Iowa Avenue, Riverside, California 92507.

13.3.3 Subparagraph (c)(5): [n/a]

13.3.4 Subparagraph (c)(6): [Amend to replace references from "EPA" to "the Executive Officer of the California Air Resources Board."]

13.4 Subparagraph (d): [n/a]

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PART II: CALIFORNIA EXHAUST AND PARTICULATE EMISSION TEST PROCEDURES FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES

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B. 40 CFR Part 1066 – Vehicle-Testing Procedures.

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7. Subpart G – Calculations.

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1066.635 NMOG determination. October 25, 2016. [n/a, except as as noted in “California NMOG Determination,” below.]

California NMOG Determination. The provisions of Part I, section D.2 shall apply. A manufacturer may use the conversion factors in section 1066.635 as an alternative to the conversion factors in section Part I, section D.1.7.5.

* * * * *

9. Subpart I – Exhaust Emission Test Procedures for Motor Vehicles.

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1066.815 Exhaust emission test procedures for FTP testing. October 25, 2016.

9.1. Exhaust emission test procedures for Partial Soak FTP testing.

Amend § 1066.815 as follows:

* * * * *

9.1.4 Amend subparagraph (d) as follows: *Test sequence.* Follow the exhaust emission measurement procedures specified in § 1066.410 through 1066.425, subject to the following exceptions and additional provisions:

* * * * *

9.1.4.3 Amend subparagraph (3) as follows: This completes the procedure for measuring Partial Soak FTP exhaust emissions. A

manufacturer may repeat the test sequence in Part II, sections B.9.1.4.1.2 to B.9.1.4.1.4 to measure Partial Soak FTP exhaust emissions on additional Partial Soak FTP tests.

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I. Test Procedures for 2026 and Subsequent Model Hybrid-Electric Vehicles, Except Plug-in Hybrid Electric Vehicles.

* * * * *

2. Urban Emission Test Provisions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Plug-in Hybrid Electric Vehicles.

* * * * *

Confirmatory testing and in-use compliance testing may be performed in any driver-selectable mode to ensure compliance with emission standards.

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3. Highway Emission Test Provisions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Plug-in Hybrid Electric Vehicles.

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3.1. Determination of Highway Emissions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Plug-in Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.840 with the following revisions:

* * * * *

3.1.4 Additional End-of-Test Criterion. If the SOC Net Energy Change Tolerance is not satisfied for the HFEDS cycle with emission sampling in Part II, section I.3.1.2, then the alternative End-of-Test criterion of ±5% SOC Net Energy Change Tolerance in Appendix C of SAE J1711 may be used to validate a Highway Emission Test with approval from the Executive Officer. Appendix C of SAE J1711 may not be used to correct measured values for any emissions. To submit an approval request, follow the procedure in Part II, section I.2.

4. SFTP Emission Test Provisions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Plug-in Hybrid Electric Vehicles.

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4.1. US06 Emission Test.

To be conducted pursuant to 40 CFR § 1066.831 with the following revisions:

* * * * *

- 4.1.6 Amend subparagraph (b)(3)(ii) as follows: Delete the following sentence: For our testing, we will generally operate the vehicle over the same preconditioning cycle that will be used for testing in this section. Add the following sentence: If driver-selectable modes are available, activate the driver-selectable mode to be tested for the preconditioning drive and for the following US06 cycle with emission sampling.

* * * * *

- 4.1.12 **Additional End-of-Test Criterion.** If the SOC Net Energy Change Tolerance is not satisfied for the US06 cycle with emission sampling in Part II, section I.4.1.10, then the alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 may be used to validate a US06 Emission Test with approval from the Executive Officer. Appendix C of SAE J1711 may not be used to correct measured values for any emissions. To submit an approval request, follow the procedure in Part II, section I.2.

* * * * *

4.2. SC03 Emission Test.

To be conducted pursuant to 40 CFR § 1066.835 with the following revisions:

* * * * *

- 4.2.7 **Additional End-of-Test Criterion.** If the SOC Net Energy Change Tolerance is not satisfied for the SC03 cycle with emission sampling in Part II, section I.4.2.4, then the alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 may be used to validate an SC03 Emission Test with approval from the Executive Officer. Appendix C of SAE J1711 may not be used to correct measured values for any emissions. To submit an approval request, follow the procedure in Part II, section I.2.

* * * * *

7. Partial Soak Emission Testing.

The test sequence consists of an Urban Emission Test as described in Part II, section I.2 followed by one, or a consecutive sequence of, Cold-Start Partial Soak Tests as described by the following procedure:

* * * * *

7.5. Alternative End-of-Test Criteria.

* * * * *

7.5.2 The SOC at the end of the Cold-Start Partial Soak Test is higher than the SOC at the beginning of the Cold-Start Partial Soak Test. To submit an approval request, follow the procedure in Part II, section I.2.

* * * * *

8. Quick Drive-Away Emission Testing.

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8.4. Alternative End-of-Test Criteria.

With approval from the Executive Officer, if the End-of-Test Criteria in subsection Part II, section I.8.3 is not satisfied after the Quick Drive-Away Emission Test, the test may be considered valid if:

* * * * *

8.4.2 The SOC at the end of the Quick Drive-Away Emission Test is higher than the SOC at the beginning of the Quick Drive-Away Emission Test. To submit an approval request, follow the procedure in Part II, section I.2.

* * * * *