

APPENDIX C

PROPOSED REGULATION ORDER

Note: The proposed regulatory text is all new language.

PROPOSED REGULATION TO PROVIDE CERTIFICATION FLEXIBILITY FOR INNOVATIVE HEAVY-DUTY ENGINES, AND CERTIFICATION AND INSTALLATION PROCEDURES FOR MEDIUM- AND HEAVY-DUTY VEHICLE HYBRID CONVERSION SYSTEMS (INNOVATIVE TECHNOLOGY REGULATION)

SECTION 2208: Purpose, Applicability, Definitions, and Reference Documents

(a) *Purpose*

This regulation sets forth optional on-road heavy-duty engine certification flexibility to encourage market launch of innovative new heavy-duty engine technologies. This regulation also defines protocols for certification of truck and bus hybrid conversion systems (also commonly referred to as hybrid aftermarket systems or conversion kits) to further encourage deployment of robust hybrid technology in California's truck and bus fleet.

(b) *Applicability*

(1) Section 2208.1 applies to the California certification of the following heavy-duty engine technologies:

- (A) 2017 through 2021 model year (MY) spark-ignition engines and 2017 through 2024 MY compression-ignition engines certifying to one of California's optional low oxides of nitrogen (NO_x) engine emission standards, set forth in California Code of Regulations, title 13, section 1956.8, subdivisions (a)(2)(A) or (c)(1)(B), as amended on December 5, 2014. These standards are 0.10 grams per brake-horsepower-hour (g/bhp-hr), 0.05 g/bhp-hr, and 0.02 g/bhp-hr NO_x. This regulation does not apply to spark-ignition engines meeting the 0.10 g/bhp-hr NO_x emission standard;
- (B) 2017 through 2024 MY engines certifying for use in a heavy-duty hybrid vehicle (hybrid engine); and
- (C) 2017 through 2027 MY engines certifying to meet the optional low-CO₂ emission standards pursuant to California Code of Regulations, title 13, section 1956.8, subdivisions (a)(7)(A) and (c)(4)(A)(1), as amended on _____. Qualifying engines may not be certified using the provision in 40 Code of Federal Regulations, Part 1036.705(d), as last

amended September 15, 2011 and hereby incorporated by reference herein, which allows the use of CO₂ emission credits to demonstrate compliance with methane and/or nitrous oxide emission limits or emission standards in lieu of the otherwise applicable emission standards.

(2) Section 2208.2 applies to the California certification of hybrid conversion systems for installation on:

- (A) A 2007 and subsequent MY California-certified base vehicle of between 6,001 and 8,500 pounds gross vehicle weight rating (GVWR), where the conversion enables the vehicle to achieve at least 35 miles all-electric range (AER);
- (B) A 2007 and subsequent MY California-certified base vehicle of between 8,501 and 14,000 pounds GVWR; and
- (C) A 2010 and subsequent MY base engine that is California-certified for installation in a vehicle over 8,500 pounds GVWR.

(c) *Definitions*

- (1) "All-electric range" or "AER" means the total miles driven, after the battery has been fully charged, with the engine and all other combustion sources turned off before the engine turns on for the first time, determined pursuant to Section 7(e) of the "California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems," as adopted on _____.
- (2) "Applicant" or "manufacturer" means any person who manufactures an engine or vehicle intended for sale in California.
- (3) "Average" means the arithmetic mean.
- (4) "Base engine" means the California-certified configuration of a pre-converted, non-hybrid conventional engine.
- (5) "Base vehicle" means the California-certified configuration of a pre-converted, non-hybrid conventional vehicle.
- (6) "Carbon dioxide" or "CO₂" means the most common of the six primary greenhouse gases, consisting on a molecular level of a single carbon atom and two oxygen atoms.
- (7) "Class 8 vehicle" means an on-road motor vehicle over 33,000 pounds GVWR.
- (8) "Compression-ignition engine" means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion

cycle. The regulation of power by controlling fuel supply in lieu of a throttle is indicative of a compression-ignition engine.

- (9) "Days," when computing any period of time, means calendar days.
- (10) "Engine family" means a grouping of vehicles or engines in a manufacturer's product line, determined in accordance with 40 Code of Federal Regulations, Part 86.098-24, as last amended April 28, 2014, which is hereby incorporated by reference herein.
- (11) "Executive Officer" means the Executive Officer of the California Air Resources Board (ARB) or the Executive Officer's designee.
- (12) "Family emission limit" or "FEL" means an emission level that is declared by the manufacturer to serve in lieu of an emission standard for certification purposes and for the averaging, banking, and trading program, pursuant to California Code of Regulations, title 13, section 2423, as amended on December 11, 2012, or 40 Code of Federal Regulations, Part 89.112(d), as last amended July 13, 2005, which is hereby incorporated by reference herein.
- (13) "Gross vehicle weight rating" or "GVWR" has the same definition as that in Vehicle Code section 350, subdivision (a), as adopted on September 29, 2000.
- (14) "Heavy-duty engine" means an engine used to propel a heavy-duty vehicle. For purposes of this definition, the term "engine" includes internal combustion engines and other devices that convert chemical fuel into motive power. For example, a fuel cell used in a heavy-duty vehicle is a heavy-duty engine.
- (15) "Heavy-duty vehicle" means any motor vehicle having a manufacturer's GVWR greater than 14,000 pounds.
- (16) "Hybrid vehicle" means a vehicle that draws propulsion energy from both an on-board: 1) internal combustion engine, microturbine, or fuel cell that uses a consumable fuel; and 2) energy storage device, such as a battery, capacitor, pressure reservoir, or flywheel.
- (17) "Hydrocarbon" or "HC" means the hydrocarbon group on which the emission standards are based for each fuel type. For alcohol-fueled engines, HC means non-methane hydrocarbon equivalent (NMHCE). For all other engines, HC means non-methane hydrocarbon (NMHC).
- (18) "Low-NOx engine" means an on-road heavy-duty engine that is certified to one of the optional 0.10 g/bhp-hr, 0.05 g/bhp-hr, or 0.02 g/bhp-hr NOx emission standards, pursuant to California Code of Regulations, title 13, section 1956.8, subdivision (a)(2)(A), as amended on December 5, 2014.

- (19) "Medium-duty vehicle" has the same definition as that in California Code of Regulations, title 13, section 1900, subdivision (b)(16), as amended on October 8, 2015.
- (20) "Model year" or "MY" means the manufacturer's annual new model production period, except as restricted under this definition. It must include January 1 of the calendar year for which the model year is named, may not begin before January 2 of the previous calendar year, and must end by December 31 of the calendar year for which the model year is named. Manufacturers may not adjust model years to circumvent or delay compliance with emission standards or to avoid the obligation to certify annually.
- (21) "Oxides of nitrogen" or "NO_x" means NO and NO₂ as measured by the procedures specified in 40 Code of Federal Regulations, Part 1065.270, as last amended April 28, 2014, which is hereby incorporated by reference herein. Oxides of nitrogen are expressed quantitatively as if the NO is in the form of NO₂, such that you use an effective molar mass for all oxides of nitrogen equivalent to that of NO₂.
- (22) "Spark-ignition engine" means a gasoline-fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle.
- (23) "Steady-state" means relating to emission tests in which engine speed and load are held at a finite set of nominally constant values. Steady-state tests are either discrete-mode tests or ramped-modal tests.
- (24) "Transit bus" means a passenger-carrying vehicle owned or operated by a public transit agency that is 35 feet or longer and greater than 33,000 pounds GVWR.
- (d) Severability. If any subsection, subdivision, paragraph, subparagraph, sentence, clause, phrase, or portion of section 2208, 2208.1, or 2208.2 of this regulation is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of the regulation.

Note: Authority Cited [HSC: §§ 38510, 38560, 39500, 39515, 39516, 39600, 39601, 43004, 43006, 43008.6, 43009.5, 43011, 43012, 43013, 43100, 43101, 43102, 43103, 43105, 43106, 43204, 43205, 43205.5, 43806; Veh. Code: §§ 27156, 38391].

Reference: [HSC §§ 38501, 39002, 39003, 39602.5, 39667, 43000, 43010, 43101.5, 43018].

SECTION 2208.1: Certification Flexibility for Innovative Heavy-Duty Engine Technology

(a) General Requirements

(1) Heavy-Duty Engine Family Certification Requirements.

Unless otherwise indicated in this regulation, a heavy-duty engine family must comply with the certification requirements of California Code of Regulations, title 13, section 1956.8, as amended on October 8, 2015, and of California Code of Regulations, title 13, section 1971.1, as amended on July 31, 2013. For such engines, the manufacturer must demonstrate compliance through the certification application process, and also comply with all reporting and recordkeeping requirements, of California Code of Regulations, title 13, sections 1969, as amended on June 15, 2007, 1971.1, as amended on July 31, 2013, 1971.5, as amended on July 31, 2013, and 2065, as amended on November 4, 2003.

(A) A heavy-duty engine family certified to meet alternative emission standards pursuant to section 2208.1, subdivision (c)(4), is not required to be certified pursuant to California Code of Regulations, title 13, section 1956.8, subdivisions (b) or (d), as amended on October 8, 2015.

(2) Surplus Emission Reductions.

(A) *Low-NOx Engines.* In order to be eligible for the certification flexibility in section 2208.1, subdivision (b), the NO_x emission level to which an engine is certified in a given MY must be lower (i.e., more stringent) than the engine's mandatory NO_x emission standard for the given MY. Generation of NO_x emission reduction credits and averaging, banking, or trading of NO_x emission reductions achieved by any such engine is prohibited under any regulation if such engine receives the certification flexibility in section 2208.1, subdivision (b).

(B) *Hybrid Engines.* In order to be eligible for the certification flexibility in section 2208.1, subdivision (c), the CO₂ emission level to which an engine family is certified in a given MY must be lower than the engine's mandatory CO₂ emission standard for the given MY. Any CO₂ emission reduction credits generated as a result of receiving the certification flexibility in section 2208.1, subdivision (c) must be immediately retired. Generation of CO₂ emission reduction credits and averaging, banking, or trading of CO₂ emission reductions achieved by any such engine is prohibited under any regulation if such engine receives certification flexibility pursuant to section 2208.1, subdivision (c).

(C) *High-Efficiency Engines.* Generation of CO₂ emission reduction credits and averaging, banking, or trading of CO₂ emission reductions achieved by an engine family meeting the optional low-CO₂ emission standard is prohibited if

the engine family receives certification flexibility pursuant to section 2208.1, subdivision (c).

(D) Notwithstanding any other provision, including the sunset dates set forth in section 2208.1, subdivisions (b)(1), (c)(1), or (d)(1), eligibility of an engine family for the provisions of section 2208.1, subdivisions (b)(2), (b)(3), or (c)(2) in a given MY sunsets if the emission levels to which the engine family is certified are no longer more stringent than the mandatory new engine standard for the given MY due to adoption of a rule, regulation, or other air quality mandate.

(b) *Certification Flexibility for Early Market Introduction of Low-NOx Engines*

(1) *Eligibility.*

(A) *Spark-ignition Low-NOx Engines.* Through the 2021 MY, an engine manufacturer shall be eligible to apply for certification of a heavy-duty spark-ignition engine family meeting the 0.05 or 0.02 g/bhp-hr NOx emission standard pursuant to the provisions of section 2208.1, subdivision (b)(2), for a maximum of three consecutive MYs, beginning with the MY in which the engine manufacturer first certifies any spark-ignition engine family pursuant to the provisions of section 2208.1, subdivision (b)(2) or (b)(3).

(B) *Compression-ignition Low-NOx Engines.* Through the 2024 MY, an engine manufacturer shall be eligible to apply for certification of a heavy-duty compression-ignition engine family meeting the 0.10, 0.05 or 0.02 g/bhp-hr NOx emission standard pursuant to the provisions of section 2208.1, subdivision (b)(2), with the following restrictions:

1. An engine manufacturer is eligible to apply for certification of a compression-ignition engine family meeting the 0.10 g/bhp-hr NOx emission standard pursuant to the provisions of section 2208.1, subdivision (b)(2) for a maximum of three consecutive MYs, beginning with the MY in which the manufacturer first certifies any low-NOx compression-ignition engine family meeting the 0.10 g/bhp-hr NOx emission standard pursuant to the provisions of section 2208.1.
2. An engine manufacturer is eligible to apply for certification of a compression-ignition engine family meeting the 0.05 g/bhp-hr NOx emission standard pursuant to the provisions of section 2208.1, subdivision (b)(2) for a maximum of three consecutive MYs, beginning with the MY in which the manufacturer first certifies any low-NOx compression-ignition engine family meeting the 0.05 g/bhp-hr NOx emission standard pursuant to the provisions of section 2208.1.
3. An engine manufacturer is eligible to apply for certification of a compression-ignition engine family meeting the 0.02 g/bhp-hr NOx

emission standard pursuant the provisions of section 2208.1, subdivision (b)(2) for a maximum of three consecutive MYs, beginning with the MY in which the manufacturer first certifies any low-NOx compression-ignition engine family meeting the 0.02 g/bhp-hr NOx emission standard pursuant to the provisions of section 2208.1.

(2) *Low-NOx Engines: Certification Flexibility Provisions.* A low-NOx engine family for which an engine manufacturer has demonstrated eligibility and compliance pursuant to section 2208.1, subdivisions (a) and (b)(1) is eligible for the flexibility in section 2208.1, subdivisions (b)(2)(A) and (B) when certified by ARB to meet the criteria pollutant heavy-duty engine emission standards.

(A) If so requested by the engine manufacturer, the Executive Officer shall provide an engine family with an assigned deterioration factor (DF) that may be used in lieu of intermediate or high-mileage emission tests to determine compliance with applicable emission standards. The assigned DF shall be determined and prescribed based on design specifications or sufficient control over design specifications, development data, in-house testing procedures, and in-use experience, and in consideration of assigned DFs for similar engine families published in the U.S. EPA National Vehicle and Fuel Emissions Laboratory guidance letter CD-12-07 (Revised), dated March 30, 2012, which is hereby incorporated by reference herein. Alternately, a manufacturer may propose an assigned DF. In proposing a DF, the manufacturer must demonstrate, using test data, that the proposed DF is appropriate for use in determining compliance with the applicable emission standards. All such demonstrations must be approved in advance by the Executive Officer. The Executive Officer shall base his or her determination upon all information submitted by a manufacturer, and upon good engineering judgment.

(B) *OBD System Requirements.* All heavy-duty engines and vehicles are required to comply with California Code of Regulations, title 13, sections 1971.1 and 1971.5, except for the allowances described in sections 2208.1, subdivisions (b)(2)(B)(1) through (4), below.

1. *OBD System Demonstration.* A manufacturer is allowed to exclude up to three low-NOx engine families per MY from the calculation of a manufacturer's total number of engine families for the purposes of California Code of Regulations, title 13, section 1971.1, subdivision (i)(2.2.3).
2. *Production Engine Evaluation Testing.* For production evaluation testing described in California Code of Regulations, title 13, section 1971.1, subdivisions (l)(1) through (l)(3) of low-NOx engine families, a manufacturer must collect and report the data to ARB, in a format approved by the Executive Officer, within twelve months after the production vehicles are first introduced into commerce.

- a. **Verification of Standardized Requirements.** In lieu of the test vehicle selection criteria specified in California Code of Regulations, title 13, section 1971.1, subdivisions (l)(1.2.1) through (1.2.3), the manufacturer must test up to five unique production vehicles within a low-NOx engine family.
 - b. **Verification and Reporting of In-use Monitoring Performance.** For testing described in California Code of Regulations, title 13, section 1971.1, subdivision (l)(3), manufacturers must submit a plan, in a format approved by the Executive Officer, to the Executive Officer, for review and approval, that details the types and number of production vehicles to be tested, the sampling method, the data collection timeline, and the reporting format. The Executive Officer may approve such plan upon determining that: i) it provides for effective collection of data from a sample of vehicles that, at a minimum, represents ten percent of the total vehicles produced for sale in California per monitoring performance group; ii) it will likely result in the collection and submittal of data within the required time frame; iii) it will generate data that are representative of California drivers and exhaust temperatures; and iv) it does not, by design, exclude or include specific vehicles in an attempt to collect data only from vehicles with the highest in-use performance ratios.
3. ***Calculation of Fines for Deficiencies.*** Up to four allowable deficiencies related to monitoring of a technology needed to meet an engine's low-NOx emission standard shall be excluded from the calculation of allowable deficiencies per low-NOx engine family for the purposes of determining the number of deficiencies subject to fines under California Code of Regulations, title 13, section 1971.1, subdivision (k)(2) .
 4. ***Ordered Remedial Action-Mandatory Recall for Emission Thresholds.*** In lieu of the recall thresholds in California Code of Regulations, title 13, section 1971.5, subdivision (d)(3)(A)(ii), the recall threshold for major monitors to indicate a malfunction shall be three times the applicable major monitor malfunction criteria. For example, if the malfunction criteria is 2.5 times the applicable standard, recall would be required when emissions exceed 7.5 times the applicable standard, or if the malfunction criteria is the particulate matter (PM) emission standard plus 0.02 g/bhp-hr, and the PM emission standard is 0.01 g/bhp-hr, recall would be required when emissions exceeded 0.09 g/bhp-hr.

(3) *Multiple Low-NOx Engine Option.*

- (A) An engine manufacturer may apply for certification flexibility pursuant to section 2208.1, subdivision (b)(3) for two low-NOx engine families that would

otherwise have been eligible for the provisions of section 2208.1, subdivision (b)(2) in a given MY. One of these two engine families must meet all criteria and requirements for an “early compliance” engine family, and the other engine family must meet all criteria and requirements for an “enhanced flexibility” engine family, as set forth in section 2208.1, subdivision (b)(3).

1. Both the “early compliance” and “enhanced flexibility” engine families must meet this regulation’s eligibility criteria and requirements described in section 2208.1, subdivision (a).
2. Neither the “early compliance” nor the “enhanced flexibility” engine family may be functionally equivalent to (i.e., of the same power rating and intended service class, utilizing the same fuel and emission control system, and meeting the same durability requirements and emission standards) an engine family from the same engine manufacturer that has received the certification flexibility identified in section 2208.1, subdivisions (b)(2) or (b)(3) in any previous MY.
3. An engine family that is functionally equivalent to (i.e., of the same power rating and intended service class, utilizing the same fuel and emission control system, and meeting the same durability requirements and emission standards), and from the same engine manufacturer as, an engine family that received the certification flexibility identified in section 2208.1, subdivision (b)(3) is ineligible for the provisions of section 2208.1, subdivision (b)(2).

(B) For three consecutive MYs, beginning with the first MY for which they are certified by ARB, any NO_x credit generated by an “early compliance” engine family, “enhanced flexibility” engine family, and any of their functionally-equivalent engine families (i.e., engine families of the same power rating and intended service class, utilizing the same fuel and emission control system, and meeting the same durability requirements and emission standards) must be immediately retired. Generation of emission reduction credits or averaging, banking, or trading of NO_x emission reductions achieved by these engine families during this time period is prohibited under any regulation.

(C) Upon a determination by the Executive Officer that all criteria and requirements set forth in section 2208.1, subdivision (b)(3) are met, the “enhanced flexibility” engine family is exempt from meeting emission threshold monitoring requirements identified in California Code of Regulations, title 13, section 1971.1 subdivisions (e) through (f) for one MY. Such engine family must comply with engine labeling requirements of section 2208.1, subdivision (c)(2)(A)(3).

(D) A 2020 and subsequent MY spark-ignition engine family and 2023 and subsequent MY compression-ignition engine family is ineligible for the provisions of section 2208.1, subdivision (b)(3)(C)(1).

(c) Certification Flexibility for Early Market Introduction of Heavy-Duty Hybrids

(1) Eligibility.

(A) Hybrids that achieve less than 35 miles AER.

1. Tier 1: A manufacturer of a hybrid engine family that is to be installed in a vehicle that does not achieve at least 35 miles AER shall be eligible to apply for certification of such an engine family pursuant to the provisions of section 2208.1, subdivision (c)(2)(A) for a maximum of two consecutive MYs, or through the 2021 MY, whichever comes first.
2. Tier 2: A manufacturer of a hybrid engine family that is to be installed in a vehicle that does not achieve at least 35 miles AER shall be eligible to apply for certification of such an engine family pursuant to the provisions of section 2208.1, subdivision (c)(2)(B) for a maximum of two consecutive MYs subsequent to the two MYs in which the engine manufacturer receives Tier 1 flexibility, or through the 2021 MY, whichever comes first.
3. A hybrid engine family that is to be installed in a transit bus that does not achieve at least 35 miles AER shall be ineligible for the provisions of section 2208.1, subdivision (c)(2).

(B) Hybrids that achieve at least 35 miles AER.

1. Tier 1: A manufacturer of a hybrid engine family that is to be installed in a vehicle that does achieve at least 35 miles AER shall be eligible to apply for certification of such an engine family pursuant to the provisions of section 2208.1, subdivision (c)(2)(A) for up to four consecutive MYs, or through the 2024 MY, whichever comes first.
2. Tier 2: A manufacturer of a hybrid engine family that is to be installed in a vehicle that does achieve at least 35 miles AER shall be eligible to apply for certification of such an engine family pursuant to the provisions of section 2208.1, subdivision (c)(2)(B) for up to two consecutive MYs subsequent to the four MYs in which the engine manufacturer receives Tier 1 flexibility, or through the 2024 MY, whichever comes first.

(C) To be eligible for the provisions of section 2208.1, subdivisions (c)(2)(A) or (c)(2)(B), a hybrid engine family must demonstrate no increase in NO_x, HC, or CO emissions, and at least a ten percent reduction in CO₂ emissions, pursuant to Section 7 of the “*California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems*,” or be installed in a heavy-duty hybrid vehicle that is

certified pursuant to the “*California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric and Other Hybrid Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes*,” as last amended October 21, 2014, which is hereby incorporated by reference herein.

(2) ITR Hybrid Technology Certification Provisions.

(A) Tier 1 Provisions.

1. An engine family certified pursuant to the provisions of section 2208.1, subdivision (c)(2)(A) shall be eligible for the provisions of section 2208, subsection (b)(2)(A).
2. *Diagnostic System Requirements.* An engine family certified pursuant to the provisions of section 2208.1, subdivision (c)(2)(A) may implement an Engine Manufacturer Diagnostic (EMD) system that meets the requirements described in California Code of Regulations, title 13, section 1971.1, subdivision (d)(7.1.4).
 - a. *Anti-Backsliding Provisions.* An engine family is not eligible to implement an EMD system that meets the requirements described in California Code of Regulations, title 13, section 1971.1, subdivision (d)(7.1.4), if a functionally equivalent engine family (i.e., of the same power rating and intended service class, utilizing the same fuel and emission control system, and meeting the same durability requirements and emission standards) from the same engine manufacturer complies with, or has previously demonstrated compliance with, the heavy-duty OBD requirements of California Code of Regulations, title 13, section 1971.1, when certified by ARB or the U.S. EPA.
 - b. Through the 2020 MY, an engine family that is ineligible for the provisions of section 2208.1, subdivision (c)(2)(A)(2) because of the exclusion identified in section 2208.1, subdivision (c)(2)(A)(2)(a) shall not be subject to the fines for deficiencies set forth in California Code of Regulations, title 13, section 1971.1, subdivisions (k)(2) and (k)(3), as amended on July 31, 2013. Further, through the 2020 MY, any such deficiency shall not be included in the determination of the number of allowable deficiencies subject to fines set forth in section 1971.1, subdivision (k)(2).
 - c. Through the 2020 MY, an engine family that is ineligible for the provisions of section 2208.1, subdivision (c)(2)(A)(2) because of the exclusion identified in section 2208.1, subdivision (c)(2)(A)(2)(a) is exempt from the requirements of California Code of Regulations, title 13, section 1971.1, subdivision (k)(4), as amended on July 31, 2013.

3. *Labeling Requirements.* An engine belonging to an engine family certified pursuant to section 2208.1, subdivision (c)(2)(A) must be clearly and permanently labeled with the following language in a location where it can be seen by a person viewing the Engine Emission Control Information Label. In cases where this label may not be visible with the engine installed in the vehicle, a duplicate label shall be applied to the vehicle next to the Vehicle Emissions Control Information label saying the following:

This engine has received certification flexibility from the California Air Resources Board because it is classified as an innovative technology pursuant to California Code of Regulations, title 13, sections 2208 and 2208.1, and may be subject to alternate diagnostic requirements pursuant to California Code of Regulations, title 13, section 2208.1.
<insert the engine's applicable ARB Executive Order number here>

- a. The label must be affixed in a permanent manner that is designed to withstand, for the engine's useful life, environmental conditions in the area where the label is attached. Environmental conditions must include, but are not limited to, exposure to engine fuels, lubricants, and coolants.

(B) *Tier 2 Provisions.*

1. An engine family certified pursuant to the provisions of section 2208.1, subdivision (c)(2)(B) shall be eligible for the provisions of section 2208, subsection (b)(2)(A).
2. *OBD System Requirements.* An engine family certified pursuant to the provisions of section 2208.1, subdivision (c)(2)(B) must implement an OBD system that meets the requirements described in California Code of Regulations, title 13, sections 1971.1 and 1971.5, except for the differences described in sections (c)(2)(B)(2)(a) through (c), below.
 - a. *OBD System Demonstration.*
 - i. A manufacturer is allowed to exclude one hybrid engine family per engine manufacturer from the calculation of a manufacturer's total number of engine families for the purposes of California Code of Regulations, title 13, section 1971.1, subdivision (i)(2.2.3).
 - ii. Except as provided in section 2208.1, subdivision (c)(2)(B)(2)(a)(iii), below, a hybrid engine that has been previously certified as a base

engine to the full heavy-duty OBD system monitoring requirements of California Code of Regulations, title 13, section 1971.1 is exempt from the OBD system demonstration testing requirements of California Code of Regulations, title 13, section 1971.1, subdivision (i)(3), as long as the hybrid engine is certified to the same standard as the base engine.

- iii. Any modifications that are made to a previously-certified heavy-duty OBD or OBD II engine or OBD system shall invalidate that engine's eligibility for the OBD system demonstration testing exemptions described in section 2208.1, subdivision (c)(2)(B)(2)(a)(ii.). The manufacturer may request that the Executive Officer exempt it from implementing monitors that are not impacted by the modifications. The Executive Officer may approve the exemption based on review of data and/or analysis submitted by the manufacturer that demonstrates that the originally calibrated emission thresholds are unaffected.

b. Production Engine Evaluation Testing.

For production evaluation testing described in California Code of Regulations, title 13, section 1971.1, subdivisions (l)(1) through (l)(3), a manufacturer must collect and report the data to ARB, in a format to be approved by the Executive Officer, within twelve months after the production vehicles are first introduced into commerce.

- i. Verification of Standardized Requirements: In lieu of the test vehicle selection criteria specified in California Code of Regulations, title 13, section 1971.1, subdivisions (l)(1.2.1) through (1.2.3) for heavy-duty engines, the manufacturer must test up to five unique production vehicles within a hybrid engine family.
- ii. Verification and Reporting of In-use Monitoring Performance. For testing described in California Code of Regulations, title 13, section 1971.1, subdivision (l)(3), manufacturers must submit a plan, in a format to be approved by the Executive Officer, to the Executive Officer, for review and approval, that details the types and number of production vehicles to be tested, the sampling method, the data collection timeline, and the reporting format. The Executive Officer may approve the plan upon determining that: i) it provides for effective collection of data from a sample of vehicles that, at a minimum, represents ten percent of the total vehicles produced for sale in California per monitoring performance group; ii) it will likely result in the collection and submittal of data within the required time frame; iii) it will generate data that are representative of California drivers and exhaust temperatures; and iv) it does not, by design, exclude or include specific vehicles in an attempt to collect data only from vehicles with the highest in-use performance ratios.

- c. *Calculation of Fines for Deficiencies.* Up to three allowable deficiencies related to issues with the implementation of the hybrid system shall be excluded from the calculation of allowable deficiencies per hybrid engine family for the purposes of determining the number of deficiencies subject to fines under California Code of Regulations, title 13, section 1971.1, subdivision (k)(2) .

(3) *Dual Executive Order*

- (A) For the 2017 through 2020 MYs, both the engine, microturbine, or fuel cell manufacturer and the hybrid driveline manufacturer shall be eligible, if so requested by both parties, to be identified on a “dual” Executive Order as the parties jointly responsible for complying with the terms of the “dual” Executive Order.
- (B) For the 2021 through 2024 MYs, both the engine, microturbine, or fuel cell manufacturer and the hybrid drive manufacturer shall be eligible, if so requested by both parties, to be identified on a “dual” Executive Order as the parties jointly responsible for complying with the terms of the “dual” Executive Order, but only if the hybrid vehicle or chassis in which they are installed demonstrates no increase in NOx, CO, or HC emissions pursuant to Section 7 of the “California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems”, adopted on _____.
- (C) For 2025 and subsequent MYs, a single Executive Order shall be granted for each engine family and hybrid drive system combination, which shall identify a single entity as the party solely responsible for complying with the terms of the Executive Order.
- (D) An engine family receiving a “dual” Executive Order pursuant to section 2208.1, subdivision (c)(3), but not that is not certified pursuant to section 2208.1, subdivisions (c)(2)(A) or (c)(2)(B), shall be exempt from the requirements of section 2208.1(a).
- (E) Notwithstanding the provisions of section 2208.1, subdivisions (c)(3)(A) and (c)(3)(B), ARB reserves the right not to issue a “dual” Executive Order in a given MY, if U.S. EPA has issued a Certificate of Conformity for the same engine, microturbine, or fuel cell and hybrid drivetrain combination, that identifies one party as solely responsible for complying with the terms of the Certificate of Conformity.

(4) *Alternate Emission Standards for Heavy-Duty Hybrids with at Least 35 Miles AER.*

An engine family that meets the requirements of section 2208.1, subdivision (c)(4)(A) shall be eligible to be certified to alternate heavy-duty engine emission standards, pursuant to section 2208.1, subdivisions (c)(4)(B) and (c)(4)(C), through the 2024 MY.

(A) *Eligibility Criteria.* The engine family must:

1. be installed in a vehicle capable of achieving at least 35 miles AER;
2. be electronically-controlled with a fully functional electronic control module (ECM);
3. not be mechanically connected to the drivetrain, and not be capable of directly propelling the vehicle in which it is installed;
4. be a newly manufactured engine;
5. utilize a diesel particulate filter, if a diesel engine; and
6. be installed in a heavy-duty hybrid vehicle that both complies with heavy-duty vehicle evaporative emission standards pursuant to California Code of Regulations, title 13, section 1976, if applicable, and is certified pursuant to the "California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric and Other Hybrid Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes" (October 2014).

(B) *Requirements for Off-Road-Equivalent Engines.* An engine meeting the requirements of section 2208.1, subdivision (c)(4)(A) that is identical to one that is certified under California Code of Regulations, title 13, sections 2403, 2423 or 2433 is eligible to be certified pursuant to section 2208.1, subdivision (c)(4)(B) for use in a heavy-duty hybrid vehicle. For such engines, the requirements in section 2208.1, subdivision (c)(4)(B)(1) through (5) apply.

1. The engines must be of a configuration that is identical to one that is certified under California Code of Regulations, title 13, sections 2403, 2423 or 2433.
2. ARB will treat engines certified pursuant to section 2208.1, subdivision (c)(4)(B) as off-road engines for compliance purposes, including selective enforcement audits, in-use testing, defect reporting, and recall. The engines must meet all the requirements that apply under California Code of Regulations, title 13, sections 2403, 2423 or 2433, as applicable, instead of the comparable requirements of California Code of Regulations, title 13, section 1956.8, with the following exceptions:
 - a. The engine must demonstrate compliance with the useful life requirements applicable to the heavy-duty vehicle class in which it will be installed, as identified in 40 Code of Federal Regulations, Part

86.004-2, as last amended on August 8, 2014, which is hereby incorporated by reference herein; and

- b. The engine must include a warranty that covers the minimum warranty period for the original off-road engine certification, but that shall cover the engine when operated and properly maintained as intended in the on-road heavy-duty vehicle. The owner's manual for the engine or for vehicle in which the engine shall be installed must include a listing of any required service and service intervals and recommended maintenance practices for the engine when used in the intended on-road heavy-duty vehicle application.
- c. Diagnostic Requirements.
 - i. Tier 1: An engine family certified pursuant to section 2208.1, subdivision (c)(4)(B) may meet the OBD requirements of section 2208.1, subdivision (c)(2)(A)(2), instead of implementing an OBD system that meets the requirements described in California Code of Regulations, title 13, sections 1971.1 and 1971.5. A vehicle manufacturer may sell in California or produce for California sale a maximum of 100 vehicles utilizing such engines per MY.
 - ii. Tier 2: An engine family certified pursuant to section 2208.1, subdivision (c)(4)(B) may meet the OBD requirements of section 2208.1, subdivision (c)(2)(B)(2), instead of implementing an OBD system that meets the requirements described in California Code of Regulations, title 13, sections 1971.1 and 1971.5. A vehicle manufacturer may not sell in California or produce for California sale more than 200 vehicles utilizing such engines, or engines that meet the requirements described in California Code of Regulations, title 13, sections 1971.1 and 1971.5, per MY.
 - iii. A vehicle manufacturer may utilize engines meeting the OBD requirements of section 2208.1, subdivisions (c)(2)(A)(2) or (c)(2)(B)(2) for up to six total MYs, with engines meeting the OBD requirements of section 2208.1, subdivisions (c)(2)(A)(2) for no more than four of the six MYs. After this period of up to six MYs, a vehicle manufacturer must utilize engines meeting heavy-duty OBD requirements of California Code of Regulations, title 13, sections 1971.1 and 1971.5.
- 3. The engine must meet the most stringent applicable emission standards for NO_x and PM for its MY, size, and classification, and may not participate in emission averaging, banking, or trading programs.

4. Before shipping engines certified under section 2208.1, subdivision (c)(4)(B), an engine manufacturer must have written assurances from the hybrid vehicle manufacturer that the hybrid vehicle manufacturer needs a certain number of exempted engines under section 2208.1, subdivision (c)(4)(B).
5. The engine must meet the following engine labeling requirements:
 - a. An engine that is of a configuration that is identical to one that is certified under California Code of Regulations, title 13, sections 2403, 2423, or 2433 must meet the applicable labeling requirements of California Code of Regulations, title 13, sections 2404, 2424, or 2434, respectively, but may not have any label identifying it as an off-road engine; and
 - b. The engine must include a label that meets the requirements of section 2208.1, subdivision (c)(2)(A)(3).

(C.) *Requirements for Light- or Medium-Duty Equivalent Engines.* An engine meeting the requirements of section 2208.1, subdivision (c)(4)(A) that is of a configuration that is identical to one installed in a light- or medium-duty vehicle certified pursuant to California Code of Regulations, title 13, sections 1961 or 1961.2 is eligible to be certified pursuant to section 2208.1, subdivision (c)(4)(C) for use on a heavy-duty hybrid vehicle. For such engines, the requirements in section 2208.1, subdivision (c)(4)(C)(1) through (4) apply.

1. The engine, including its emission control system, must be of a configuration that is identical to one installed in a light- or medium-duty vehicle that is certified pursuant to California Code of Regulations, title 13, sections 1961 or 1961.2.
2. ARB will treat engines certified pursuant to section 2208.1, subdivision (c)(4)(C) as light- and medium-duty engines for compliance purposes, such as selective enforcement audits, in-use testing, defect reporting, and recall. The engine must meet all the requirements that apply under California Code of Regulations, title 13, sections 1961 or 1961.2, as applicable, instead of the comparable requirements of California Code of Regulations, title 13, section 1956.8, with the following exceptions:
 - a. The engine must demonstrate compliance with the useful life requirements applicable to the heavy-duty vehicle class in which it will be installed, as identified in 40 Code of Federal regulations, Part 86.004-2; and
 - b. The engine must include a warranty that covers the minimum warranty period for the original light- or medium-duty engine, but that shall cover the engine when operated and properly maintained as intended in the

on-road heavy-duty vehicle. The owner's manual for the engine or for vehicle in which the engine shall be installed must include a listing of any required service and service intervals and recommended maintenance practices for the engine when used in the intended on-road heavy-duty vehicle application.

c. Diagnostic Requirements.

- i. Tier 1: An engine family certified pursuant to section 2208.1, subdivision (c)(4)(C) may meet the OBD requirements of section 2208.1, subdivision (c)(2)(A)(2) instead of implementing an OBD system that meets the requirements described in California Code of Regulations, title 13, sections 1971.1 and 1971.5. A vehicle manufacturer may sell in California or produce for California sale a maximum of 100 vehicles utilizing such engines per MY.
 - ii. Tier 2: An engine family certified pursuant to section 2208.1, subdivision (c)(4)(C) may meet the OBD requirements of section 2208.1, subdivision (c)(2)(B)(2) instead of implementing an OBD system that meets the requirements described in California Code of Regulations, title 13, sections 1971.1 and 1971.5. A vehicle manufacturer may utilize a maximum of 200 such engines, or engines that implement an OBD system that meets the requirements described in California Code of Regulations, title 13, sections 1971.1 and 1971.5, per MY.
 - iii. A vehicle manufacturer may utilize engines meeting the OBD requirements of section 2208.1, subdivisions (c)(2)(A)(2) or (c)(2)(B)(2) for up to six total MYs, with engines meeting the OBD requirements of section 2208.1, subdivisions (c)(2)(A)(2) for no more than four of the six MYs. After this period of up to six MYs, a vehicle manufacturer must utilize engines meeting heavy-duty OBD requirements of California Code of Regulations, title 13, sections 1971.1 and 1971.5.
3. Before shipping engines certified under section 2208.1, subdivision (c)(4)(C), a light-duty engine or vehicle manufacturer must have written assurances from the hybrid vehicle manufacturer that the hybrid vehicle manufacturer needs a certain number of exempted engines under section 2208.1, subdivision (c)(4)(C);
 4. The engine must meet the following engine labeling requirements:
 - a. The engine must meet the requirements of California Code of Regulations, title 13, section 1965, and may not have any label identifying it as a light- or medium-duty engine; and

- b. The engine must include a label that meets the requirements of section 2208.1, subdivision (c)(2)(A)(3).

(D) *Data Collection and Reporting.* Each engine that is certified pursuant to section 2208.1, subdivision (c)(4), and any vehicle in which such engine is installed, must collect the data in section 2208.1, subdivisions (c)(4)(D)(1) and (2) on a second-by-second interval for a minimum of three calendar years from the time that the engine or vehicle is first deployed in a California fleet.

1. The following data must be presented as the average and mean among all of a manufacturer's vehicles certified pursuant to section 2208.1, subdivision (c)(4), must include a histogram distribution of such data (at ten percent intervals), and must be segregated by calendar year and engine family and drivetrain combination.
 - a. Total miles traveled;
 - b. Daily miles traveled (miles/day);
 - c. Speed without idle (miles/hour);
 - d. Percent time operating in the following mile per hour intervals: (0+ to 10; 10+ to 20; 20+ to 30; 30+ to 40; 40+ to 50; 50+ to 60; 60+);
 - e. Fuel economy (miles/gallon);
 - f. Percent zero-emission operation (plug-in vehicles only); and
 - g. Miles of continuous zero-emission operation at full charge (plug-in vehicles only).
2. When certifying a hybrid vehicle pursuant to section 2208.1, subdivision (4)(A)(6) for the purposes of enabling an engine to be eligible for the provisions of section 2208.1, subdivision (4), a vehicle manufacturer must provide the data identified in section 2208, subdivision (D) for all its hybrid vehicles that utilize engines certified pursuant to section 2208, subdivision (4) within the three previous MYs. Such data must be up to date as of no more than 90 days prior to the hybrid vehicle's certification application date. The manufacturer must also provide all raw data supporting the data summaries to the Executive Order, in a format approved by the Executive Officer, within thirty days, upon ARB request.
3. The vehicle manufacturer shall keep all records related to warranty-related engine and vehicle maintenance and repair that occur during the first three years a vehicle that utilizes an engine certified pursuant to section 2208.1(c)(4) is in service, including description and cost of repairs, and number of days the vehicle is out of service for said maintenance and repairs. The vehicle manufacturer shall keep such records for each vehicle for a minimum of five years from the date the vehicle is entered

into service, and shall provide this information to ARB, in a format approved by the Executive Officer, within thirty days, upon ARB request.

(d) High-Efficiency Heavy-Duty Engine

(1) Eligibility and Certification Flexibility.

A manufacturer shall be eligible, when applying for certification of an engine family to the optional low-CO₂ emission standards pursuant to California Code of Regulations, title 13, section 1956.8, subdivisions (a)(7)(A) and (c)(4)(A)(1), for the provisions of section 2208.1, subdivisions (c)(2)(A) or (c)(2)(B) for up to six consecutive MYs, through the 2027 MY, beginning with a maximum of up to four MYs eligibility for the provisions of section 2208.1, subdivision (c)(2)(A).

(A) For a high-efficiency heavy-duty engine eligible for the provisions of section 2208.1, subdivision (c)(2)(B)(2)(c), the three additional allowable deficiencies excluded from the calculation of allowable deficiencies subject to fines must be related to achievement of the optional low-CO₂ emission standards identified in California Code of Regulations, title 13, section 1956.8, subdivisions (a)(7)(A) and (c)(4)(A)(1).

(B) A hybrid engine certified to the optional low-CO₂ emission standards pursuant to California Code of Regulations, title 13, section 1956.8, subdivision (a)(7) shall be ineligible for certification pursuant to the provisions of section 2208.1, subdivision (d).

(2) Allowable Sales Volumes.

(A) A manufacturer may not produce or sell more than 100 engines certified to the optional low-CO₂ emission standards that receive certification flexibility pursuant to section 2208.1, subdivision (c)(2)(A) per MY.

(B) A manufacturer may not produce or sell more than 200 engines certified to the Optional Low-CO₂ Emission Standards that receive certification flexibility pursuant to section 2208.1, subdivision (c)(2)(B) per MY.

Note: Authority Cited [HSC: §§ 38510, 38560, 39500, 39515, 39516, 39600, 39601, 43004, 43006, 43008.6, 43009.5, 43011, 43012, 43013, 43100, 43101, 43102, 43103, 43105, 43106, 43204, 43205, 43205.5, 43806; Veh. Code: §§ 27156, 38391].

Reference: [HSC §§ 38501, 39002, 39003, 39602.5, 39667, 43000, 43010, 43101.5, 43018].

SECTION 2208.2: Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems

(a) Applicable Test Procedures

The “California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems,” as adopted _____, which is hereby

incorporated by reference herein, are the certification and installation procedures that shall apply for California approval of systems that convert the following non-hybrid base vehicles to operate as a hybrid:

- (1) A 2007 and subsequent MY base vehicle of between 6,001 and 8,500 pounds GVWR, where the conversion enables the vehicle to achieve at least 35 miles AER;
- (2) A 2007 and subsequent MY base vehicle of between 8,501 and 14,000 pounds GVWR; and
- (3) A 2010 and subsequent MY base engine certified by ARB for installation in a vehicle over 8,500 pounds GVWR.

NOTE: Authority cited: [HSC: §§ 39515, 39600, 39601, 43000, 43006, and 43013].

Reference: [HSC: §§ 43000, 43004, 43006, 43008.6, and 43013; Veh. Code: §§ 27156 and 38391].