

**Innovative Technology Regulation (ITR):
February 25, 2016 Hybrid Conversion System Public Work Group Meeting
POTENTIAL DRAFT REGULATORY LANGUAGE FOR STAKEHOLDER REVIEW**

This document provides potential draft regulatory language for the hybrid conversion system element of the proposed ITR, and is intended to facilitate stakeholder feedback at the February 25, 2016 ITR Hybrid Conversion System Public Work Group meeting. This document is only intended to encourage public feedback, is incomplete, and should not be construed as a formal regulatory proposal. Staff comments to facilitate stakeholder review are provided in blue test boxes. This document includes the following potential draft regulatory sections:

- **Section 2208: ITR Purpose, Applicability and Definitions (draft language included below for work group discussion)**
- **Section 2208.2: Medium- and Heavy-Duty Vehicle Hybrid Conversion System Certification Requirements (draft language included below for work group discussion)**

Attachment 1 summarizes the potential draft regulatory structure and concepts described in this draft document.

Possible initial draft emission test procedures for hybrid conversions were discussed at the January 27, 2016 ITR Hybrid Technology Interim Emission Test Procedures public work group meeting (additional information is available at: <http://www.arb.ca.gov/msprog/itr/meetings.htm>) and are still under development

Possible draft regulatory language for potential section 2208.1: Certification Flexibility for Innovative Heavy Duty Engine and Vehicle Technology is provided in a separate document for discussion at the February 25, 2016 New Heavy-Duty Engine and Vehicle Certification public work group meeting (see: <http://www.arb.ca.gov/msprog/itr/meetings.htm>).

SECTION 2208

(a.) *Purpose (hybrid conversion element only)*

This regulation defines protocols for ARB approval of innovative hybrid conversion systems for medium- and heavy-duty vehicles, in order to encourage California deployment of robust aftermarket hybrid aftermarket systems in the existing truck and bus fleet.

(b.) *Applicability (hybrid conversion element only)*

This regulation applies to the following:

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(1) a hybrid conversion system for a 2007 and subsequent model year (MY) California-certified medium-duty vehicle or a 2010 and subsequent MY heavy-duty vehicle with a California-certified 2010 and later model-year engine that demonstrate the ability to achieve a minimum ten percent carbon dioxide (CO₂) emission benefit without increasing criteria pollutant emissions, pursuant to the emission testing protocols identified in Attachment A.

(c.) *Definitions (hybrid conversion element only)*

“All-Electric Range” or “AER” means the total miles driven electrically (with the engine off) before the engine turns on for the first time, after the battery has been fully charged, determined pursuant to the applicable requirements identified in Attachment A.

“Applicant” or “manufacturer” means any person who manufactures an engine, vehicle, or hybrid conversion system for sale in California and requests engine certification flexibility of hybrid conversion system certification pursuant to this regulation.

“Average” means the arithmetic mean.

“Base vehicle” or “base engine” means the appropriate California certified configuration of a pre-converted or non-hybrid conventional vehicle to be used for comparison with its hybrid counterpart for the purposes of determining the emission impact of the hybrid vehicle’s hybrid system.

“Class 2a commercial or public fleet vehicle” means an on-road vehicle of between 6,001 and 8,500 pounds gross vehicle weight rating (GVWR) that is used by a business or public, governmental, or non-profit agency to carry people, property or hazardous materials in the course of that business or agency’s official duties.

“Class 2b vehicle” refers to a vehicle between 8,501 and 10,000 lbs GVWR.

“Class 3 vehicle” refers to a vehicle between 10,001 and 14,000 lbs GVWR.

“Class 8 Tractor” means a Class 8 motor vehicle with a gross vehicle weight rating of greater than 33,000 lbs designed to pull a 53-foot or longer semitrailer on a highway by means of a fifth wheel mounted over the rear axle(s).

“Commercial Vehicle” means a motor vehicle or combination of motor vehicles as defined in California Vehicle Code, section 260.

Definition below would be for purposes of determining a manufacturer’s annual average sales volume, and resulting ITR annual MY sales allocations.

“Common Ownership or Control” means being owned or managed day to day by the same person, corporation, partnership, or association. Entities managed by the same directors, officers, or managers, or by corporations controlled by the same majority

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stockholders are considered to be under common ownership or control even if their title is held by different business entities.

"Conversion system manufacturer" or "converter" refers to a person or company who manufactures or assembles a hybrid conversion system for sale in California and requests or is granted an Executive Order certifying the hybrid conversion system.

"Days" when computing any period of time, means calendar days.

"Drivability" means the smooth delivery of sufficient and reliable power for the intended vehicle type and duty cycle, as demanded by the driver.

"Engine family" means a grouping of vehicles or engines in a manufacturer's product line determined in accordance with 40 CFR 86.098-24.

"Executive Officer" means the Executive Officer of the ARB or the Executive Officer's designee.

"Gross vehicle weight rating" or "GVWR" means the "GVWR" as defined in California Vehicle Code section 350.

"Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating (GVWR) greater than 14,000 pounds.

"Hybrid conversion system" is a package of energy storage and delivery, ignition, emission control, OBD, and engine components that are modified, removed, or added during the process of modifying a base vehicle to operate as a hybrid vehicle.

"Hybrid vehicle" refers to a vehicle that has both of the following on-vehicle sources of stored energy and can draw propulsion energy from the source mentioned in 2): 1) a consumable fuel and 2) an energy storage device such as a battery, capacitor, pressure reservoir, or flywheel.

"Installer" or "hybrid conversion system installer" refers to a person who installs hybrid conversion systems on motor vehicles and/or engines for compensation or consideration of value; but does not necessarily include any person that assembles or produces a hybrid conversion system for resale.

"Medium-duty vehicle" means a medium-duty vehicle as defined in Section 1900, title 13, CCR.

"Valid warranty claim" means a request from an end user, installer, or distributor to the applicant for an inspection, repair, adjustment, replacement, or modification of a specific part or component of the hybrid conversion system or the base engine for which the hybrid system converter is invoiced for compensation pursuant to the warranty

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provisions and compensation is actually provided, excluding warranty repairs made solely for customer satisfaction purposes (i.e., good faith repairs).

“Warrantable condition” means any condition of a hybrid conversion system or base engine that triggers the responsibility of the converter to take corrective action pursuant to sections 2208.2(g) and (h).

“Warranted part” means... (*tbd*)

“Warranty period” means the period of time, mileage, and/or hours, as identified in Table 2, that the certified hybrid conversion system or part thereof are covered by the warranty provisions.

“Warranty claim” means a request from an end user, installer, or distributor to the applicant for an inspection, repair, adjustment, replacement, or modification of a specific part or component of the hybrid conversion system or base engine impacted by the hybrid conversion system.

“Zero-emission power take-off” or electric power take-off (ePTO) means a method for taking power from an on-vehicle source (typically a battery) that produces no emissions of pollutants and which can be used to power a non-vehicular device that is permanently connected to the vehicle, such as an aerial boom or pump.

§ 2208.1

Certification Flexibility for Innovative Heavy-Duty Engine and Vehicle Technology

This potential draft section will be reviewed and discussed by the New Heavy-Duty Engine and Vehicle Certification Public Work Group at its public meeting on February 25, 2016. Please visit www.arb.ca.gov/msprog/itr/itr.htm or contact Mr. Joe Calavita of the ARB Staff at jcalavit@arb.ca.gov for more information.

§ 2208.2

Certification and Installation Procedures for Medium- and Heavy-Duty Hybrid Aftermarket Conversion Systems

(a) Overview

(1) A hybrid conversion system shall be certified for sale in California based upon the Executive Officer’s determination that it meets this regulation’s applicable diagnostic, warranty, and other requirements, does not increase emissions of any criteria pollutant, and demonstrates potential to achieve a minimum ten percent CO₂ emission benefit from the applicable pre-converted, base vehicle configuration. This regulation permits a manufacturer to certify to its hybrid conversion systems to

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progressively more rigorous diagnostics, warranty, and other certification requirements as California sales volumes increase, as described in subsection 2208.2(a)(1.1), below. This structure, in which a hybrid conversion system may certify to progressively more stringent requirements to facilitate initial market launch and growth, sunsets on January 1, 2022 for a hybrid conversion system capable of less than 35 miles all-electric range, and on January 1, 2025 for a conversion system that achieves 35 or more miles all-electric range.

(1.1) A manufacturer may submit one of the three following possible Applications for ARB-Approval of a Hybrid Conversion System:

(A) A manufacturer submits a *Tier 1: Hybrid Conversion System Demonstration Application* to receive initial ARB certification of the hybrid conversion system. A hybrid conversion system that complies with this regulation’s Tier 1 hybrid conversion system requirements may be sold in numbers up to the Demonstration Volumes identified in Table 1. A manufacturer may opt to skip Tier 1 and proceed directly to Tier 2 or Tier 3 if it meets these tiers’ more stringent certification requirements identified in this regulation.

(B) A manufacturer submits a *Tier 2: Hybrid Conversion System Pilot Deployment Application* if it has successfully conducted the required emission testing for the conversion system and it wishes to sell more than Demonstration Volumes. A hybrid conversion system that meets more rigorous Tier 2 requirements may be sold in the Pilot Deployment Volumes identified in Table 1. A manufacturer may opt to skip Tier 2 and proceed directly to Tier 3 if it meets Tier 3 certification requirements identified in this proposed regulation.

(C) A manufacturer submits a *Tier 3: Hybrid Conversion System Final Certification Application* if it has successfully conducted the required emission testing for the conversion system and it wishes to sell more than Demonstration or Pilot Deployment Volumes. A hybrid conversion system that meets the most stringent Tier 3 hybrid conversion system certification requirements is not subject to sales volume limits.

Table 1: Maximum Allowable California Sales Volume of Hybrid Conversion Systems per Manufacturer			
	Tier 1: Demonstration Certification	Tier 2: Pilot Deployment Certification	Tier 3: Full Certification
Conversion System Achieves <35 Miles AER ¹	10	500	N/A
Conversion System Achieves 35+ Miles AER ²	25	1,000	N/A

1 – Eligibility for Tier 1 and Tier 2 certification pathways sunset on January 1, 2022.

2 – Eligibility for Tier 1 and Tier 2 certification pathways sunset on January 1, 2025.

(2) *Application Process.*

(2.1) To obtain ARB certification of the hybrid conversion system, the applicant must submit an application to the Executive Officer pursuant to subsections

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2208.2(a)(2) and (3). The Executive Officer shall use the information provided during the application process to help determine whether the hybrid conversion system relies upon sound principles of science and engineering to meet required eligibility criteria, the need for additional analyses, and the appropriateness of allowing for alternatives to the prescribed requirements. The applicant must submit one application for each discrete conversion system as it applies to each potential base vehicle test group or engine family. Supporting data in electronic format may be accepted as part of an application at the discretion of the Executive Officer. An application must be submitted in the format to be supplied by the Executive Officer.

(3) *Hybrid Conversion System Application.*

The Hybrid Conversion System Application shall include the following information:

(3.1) Identification of the business contact person, business phone number, physical business address, and business email address of the responsible party submitting the application.

(3.2) Name, business affiliation, business title, business e-mail address and business telephone number for (1) persons authorized to sign documents for submittal to ARB, (2) single point of contact authorized to communicate with ARB staff during the application review process, and (3) applicant's product website information, if applicable.

(3.3) *Hybrid Conversion System Information.*

(A) Detailed schematics, wiring diagrams, and parts list, including a unique make and model (if applicable) and identifying part number for all individual components of the hybrid conversion system, such as battery pack, traction motor, controller, inverter, on-board charger, and other components;

(B) Detailed description of the energy storage system, including (if applicable), battery manufacturer, battery chemistry, connection type (e.g., series, parallel, or other), charge depleting or sustaining system, weight, power, maximum voltage, and voltage at 50 percent state of charge;

(C) An explanation of how the hybrid conversion system interacts with or integrates into the base vehicle;

(D) Description of any modifications made to the original engine hardware or after-treatment device(s), and any modifications made to the engine original software calibrations.

(E) An engineering evaluation of potential negative emission impacts of installation of the hybrid conversion system on the base vehicle, including but not limited to potential for increased cold start or low temperature operation leading to increased NO_x emissions, potential for increased evaporative or exhaust hydrocarbon emissions, and how the hybrid conversion system could potentially change the engine's certified regeneration cycles or events for emission control devices such as diesel particulate filters;

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(F) Copy of the supplemental emission control label required pursuant to subsection 2208.2(b)(5), owner's manual required pursuant to subsection 2208.2(b)(6), warranted parts list, warranty statements required pursuant to subsection 2208.2(b)(3) and (5), and warranty notifications required pursuant to subsection 2208.2(b)(4);

(G) Demonstration that the hybrid conversion system meets the general requirements of section (b) and the applicable Tier 1, Tier 2, or Tier 3 eligibility requirements of subsections 2208.2(c), (d) and (e).

(3.4) *Hybrid Conversion System Manufacturing, Installation and Maintenance.*

(A) Names and addresses of the fabrication, assembly line, and test facilities where the hybrid conversion system and its major components are manufactured and tested;

(B) Procedures for installing and maintaining the hybrid conversion system, including tune-up specifications and discussion of any special tools or techniques required for its proper installation, maintenance, or operation;

(C) Business names, physical business addresses, business email addresses and business phone numbers of conversion system installers, and copy of all contract(s) and other written agreements between the hybrid conversion system manufacturer and installer(s);

(3.5) *Base Vehicle Information.* Description of the chassis and engine combination(s) on which the hybrid conversion system shall be installed, including base vehicle test group and/or base engine family, base vehicle or engine weight class, and the applicable engine emission standards for non-methane hydrocarbons (NMHC), CO, NOx, and particulate matter (PM).

(3.6) *OBD Requirements.* This regulation's OBD requirements may necessitate modification of the original vehicle or engine OBD system. All modifications affecting OBD compliance including added, modified, or removed original vehicle hardware, (e.g., components, wiring) or software (e.g., programming, calibration) must be fully documented and described. Section (c)(2.4) provides more information on the information required.

(3.7) *Application Updates.* The applicant shall identify and explain any modifications or updates to the information provided in any previous application for ARB approval of the applicable hybrid conversion system.

(3.8) The Executive Officer reserves the right to require that an applicant's hybrid conversion system certification application be submitted with a market ready hybrid conversion system that is identical in all material respects to the product that will be sold upon receiving ARB approval. If such a request is made by the Executive Officer, the applicant must submit the market ready hybrid conversion system within 30 days or the application will be disapproved. The Executive Officer shall return, at the applicant's expense, the market-ready hybrid conversion system after the hybrid conversion system application has been granted, denied, or withdrawn.

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(3.9) *Compliance Statements.*

The application shall be signed and dated by the applicant and include the following statement above the signature and date:

“I affirm that to the best of my knowledge this hybrid conversion system shall not cause the emission into the ambient air of any noxious or toxic matter that is not emitted in the operation of such motor vehicle without such device.

I understand that Air Resources Board (ARB) approval of this hybrid conversion system, if granted, does not constitute a certification, accreditation, approval, or any other type of endorsement by the ARB of any claims concerning alleged emission benefits of a hybrid conversion system and that no claims of any kind concerning anti-pollution benefits may be made for an approved hybrid conversion system, with the exception of any potential CO₂ emission benefit specified in the device’s applicable ARB Executive Order.”

(b) *General Requirements*

In addition to all other requirements, the following general requirements shall apply to all hybrid conversion systems to be certified under these procedures:

(1) *Base Vehicle Specifications.*

(1.1) For medium-duty vehicle hybrid conversions, only California-certified 2007 model-year and later medium-duty may be converted.

(A) A Class 2a vehicle may be approved for conversion if the manufacturer demonstrates that the base vehicle make and model is marketed by the original vehicle manufacturer for purchase by commercial or public fleets only, and is not marketed or sold to individuals or households.

(1.2) For heavy-duty vehicle hybrid conversions, only California-certified 2010 and later model-year engines may be converted.

(2) No component or calibration of the hybrid conversion system that could affect emission performance shall be adjustable by the system installer or the vehicle user.

(3) *Drivability.* The drivability of a vehicle equipped with a hybrid conversion system shall not be degraded in such a way as to encourage consumer tampering or create a safety hazard. To verify that the drivability of a converted vehicle is acceptable, the Executive Officer may require that an independent laboratory evaluate drivability. The Executive Officer's determination that drivability is acceptable must be based on an engineering evaluation of the hybrid conversion system described in the application for certification or on reports or observations that hybrid conversion systems similar in design to the system for which certification is sought have caused drivability degradation. The cost of this evaluation shall be borne by the applicant.

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(4) *Anti-Backsliding.* Notwithstanding the provisions of this regulation, the Executive Officer reserves the right to require a hybrid conversion system meet a more stringent emissions compliance, diagnostics, warranty, or other requirement if the hybrid conversion system is subject to such a requirement by the US EPA.

Staff welcomes staff comments regarding potential emission control labeling requirements (below) intended to reflect installation of the hybrid conversion system, facilitate engine and conversion system repair and regulatory enforcement, and aid diagnostic technicians.

(5) *Emission Control Label.* The emissions control label requirements in Title 13, CCR, Section 1965, shall apply to hybrid conversion systems, with the following additions:

(A) The applicant shall provide a supplemental Emission Control Information label, which shall be affixed in a permanent manner to each converted vehicle in a location adjacent to the original Emission Control Information Label. If the supplemental label cannot be placed adjacent to the original label, it shall be placed in a location where it can be seen by a person viewing the original label.

(B) The supplemental label shall show the vehicle or engine model year; Executive Order number certifying the hybrid conversion system, the hybrid conversion system manufacturer's business name, business address, and business telephone number; and shall state that the converted vehicle or engine complies with California emission requirements. The label shall also list any parts that were added and removed during installation of the hybrid conversion system, as well as any changes in tune-up specifications required for the hybrid conversion system. In addition, the label shall show the installer's business name, business address, and business telephone number; date and mileage (converted vehicle odometer reading) on which the hybrid conversion system was installed; and date and mileage at which the hybrid conversion system warranty expires. It is not necessary for emission control labels installed with hybrid conversion systems to be machine readable.

(6) *Owner's Manual.* Each hybrid conversion system installed shall include an owner's manual containing at least the following information:

(A) a brief description of the hybrid conversion system, including major components and their theory of operation;

(B) battery maintenance best practices and charging procedures and protocols for the hybrid conversion system, if applicable;

(C) a listing of necessary service and service intervals, as well as tune-up data which differ from the service requirements specified by the vehicle's or engine's original manufacturer;

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(D) the name, physical business address, business email address, business phone number, and website, if available, of the manufacturer and installer, as well as a list of the names, addresses, and phone numbers of the major dealers in California who supply parts for, or service, the hybrid conversion system.

(E) All information necessary for proper and safe operation of the vehicle, including information on the safe handling of the battery system, and emergency procedures to follow in the event of battery leakage or other malfunctions that may affect the safety of the vehicle operator, emergency personnel, or laboratory personnel.

(7) A description of information must be provided to hybrid vehicle dealers/purchasers regarding proper disposal of the hybrid vehicle battery and a copy must be provided to ARB, along with a description of how this information is conveyed.

(8) ARB reserves the right to conduct additional emission testing to evaluate whether a hybrid conversion system adversely impacts emissions. If such tests demonstrate that the hybrid conversion system adversely effects emissions, the Executive Order for the hybrid conversion system shall be rescinded and the Executive Officer shall initiate recall proceedings pursuant to subsection 2208.2(h). Further, if such tests or other evidence provides the ARB with reason to suspect that the hybrid conversion system will adversely affect durability of the vehicle emission control system, the manufacturer shall be required to submit durability data within 30 days, or another mutually agreed upon date, demonstrating that the durability of the vehicle emission control system is not affected.

(9) A hybrid conversion system manufacturer must have a written contractual relationship with any hybrid conversion system installer authorized to install the hybrid conversion system. The hybrid conversion systems manufacturer shall provide the installer with specific, written instructions regarding installation procedures needed to comply with the diagnostics, labeling and other requirements of this regulation. A copy of said written contract and installation procedures shall be provided by either the manufacturer or the installer to ARB within ten days of request.

(10) The Executive Officer shall revoke the certification of the hybrid conversion system if the applicant fails to observe the requirements of this regulation. An applicant that fails to submit a recall plan as requested by the Executive Officer or to complete the requirements of an approved recall plan, including the reporting requirements, shall be subject to civil penalties as specified in state law and regulations, including, but not limited to, Health and Safety Code Sections 39600, 39660, and 39674.

(11) *Disclosure Requirements.* When applying for public incentive funding for demonstration or deployment of a hybrid conversion system in California, the conversion system manufacturer must disclose in writing to the funding entity as part of the funding application the current level of ARB certification (Tier 1, Tier 2, or Tier 3)

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and any applicable California sales limits identified in that certification. Said disclosure must indicate whether requested incentive funding is intended to fund a volume of hybrid conversion systems that is allowed by the current ARB certification, or a volume that cumulatively would exceed what is allowed by the current ARB certification.

(c) *Tier 1 Demonstration Certification*

(1) A manufacturer must receive Executive Officer approval of its Hybrid Conversion System Demonstration Application to sell up to the Tier 1 California sales volumes identified in Table 1 of its hybrid conversion systems.

(1.1) The sum of each manufacturer's Tier 1-certified hybrid conversion system units sold in California may not cumulatively exceed the Tier 1 volumes identified for a conversion system that achieves less than 35 miles all-electric range or a conversion system that achieves at least 35 miles all-electric range, respectively, as illustrated in Table 1.

(1.2) Eligibility for a hybrid conversion system to receive Tier 1 certification shall sunset as follows:

(A) As of January 1, 2022 for a hybrid conversion system that does not achieve at least 35 miles all-electric range.

(B) As of January 1, 2025 for a hybrid conversion system that does achieve at least 35 miles all-electric range.

(1.3) Eligibility for a hybrid conversion system that has received Tier 1 certification to be sold in California shall sunset as follows:

(A) As of January 1, 2027 for a hybrid conversion system that does not achieve at least 35 miles all-electric range.

(B) As of January 1, 2030 for a hybrid conversion system that does achieve at least 35 miles all-electric range.

(2) *Tier 1 Eligibility Requirements.*

(2.1) *Exhaust Emissions.* The applicant shall demonstrate, based upon sound principles of science and engineering and/or independent, verifiable data that the hybrid conversion system achieves at least a ten percent reduction in CO₂ emissions and is unlikely to increase emissions of any criteria pollutant from any base engine, vehicle or chassis identified in subsection 2208.2 (a)(3.5).

(A) *Emissions Testing Plan.* Applicant shall submit a detailed plan to ARB for approval, describing how the applicant commits to complete required exhaust emissions testing, in accordance with the requirements of Attachment A.

1. Applicant must complete all required emission testing in accordance with the Executive Officer approved emission testing plan within 24 months of ARB approval of the applicant's Hybrid Conversion System Demonstration Application.

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2. A manufacturer may apply to ARB for Tier 1 certification of more than one hybrid conversion system only if all other of that manufacturer's hybrid conversion systems that are or have been previously Tier 1 certified have since successfully completed required emission testing demonstrating no increase in criteria pollutants pursuant to Attachment A.

(2.2) *Evaporative Emissions.* The applicant must demonstrate the conversion system will not increase evaporative emissions from the base vehicle.

(A) A manufacturer of a hybrid conversion system for a base vehicle of less than 14,000 lbs GVW shall demonstrate the converted vehicle meets the evaporative emissions standard to which the base vehicle was originally certified by conducting the two-day diurnal evaporative procedure emissions test as specified in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Motor Vehicles" last amended December 6, 2012.

(B) A manufacturer of a hybrid conversion system for a base vehicle of 14,000 lbs GVW or more may provide an engineering evaluation demonstrating that the conversion system does not increase evaporative emissions from the base vehicle.

(C) A converted vehicle with a compression ignition engine or a sealed fuel system that can demonstrate no evaporative emissions is exempt from evaporative emissions testing. This demonstration may be based upon an engineering evaluation of the base vehicle and hybrid conversion system and data submitted by the conversion system manufacturer and must show that the hybrid conversion system has no evaporative-related emissions under normal operation. Any such demonstration must be approved by the Executive Officer.

(2.3) *Data Collection Requirements.* A manufacturer shall collect the following information regarding each hybrid conversion system that receives Tier 1 or Tier 2 certification, which shall be current as of the hybrid conversion system installation date. This information shall be kept for at least five years from the hybrid conversion system's installation date and shall be provided to the Executive Officer within ten days upon request.

(A) *Vehicle Information.*

1. Vehicle make, model, model year, identification number (VIN), and California license plate number.
2. Vehicle owner's physical address, email address, and phone number.
3. Vehicle operator's name and physical address (if different than owner).
4. Conversion system installer name, physical address, email address, and phone number.
5. Location, date, and odometer reading at time of installation.
6. ARB certification Tier (i.e., Tier 1 or 2).

(2.4) *Tier 1 On-Board Diagnostics Requirements.*

If the vehicle/engine to be retrofitted was certified with an OBD system, pursuant to sections 1968.2 or 1971.1, title 13 CCR, all applicable OBD requirements (e.g., monitoring standardization, in-use monitoring frequency, certification, demonstration)

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remain applicable with the exception of the allowances described in subsection (c)(2.3)(A) through (F) below. As such, the proper function of the OBD system shall not be impaired as a result of the installation and operation of the hybrid retrofit system. This includes, but is not limited to, ensuring the converted vehicle's or engine's OBD system robustly detects malfunctions at the required emission thresholds, implements required monitors for applicable added or modified electronic hardware or emission controls, complies with standardization requirements, and is subject to required demonstration and production vehicle and engine testing. These requirements may necessitate modification of the original vehicle or engine OBD system. All modifications affecting OBD compliance including added, modified, or removed original vehicle hardware (e.g., components, wiring) or software (e.g., programming, calibration) must be fully documented and described as part of the hybrid system certification application.

(A.) *Monitoring Requirements.* All vehicles that qualify for Tier 1 Certification flexibility are required to implement an Engine Manufacturer's Diagnostic (EMD) system on the hybrid system that meets the requirements described in 13 CCR 1971.1 section (d)(7.1.4).

(B.) *Hybrid System Diagnostic Link Connector (HSDLC).* If the vehicle includes a dedicated HSDLC to communicate with the hybrid diagnostic system, the HSDLC shall be distinguished from the base vehicle's OBD system DLC by locating the HSDLC in the vehicle interior to the right of the centerline of the vehicle.

(C.) *Monitoring Conditions.* 2013 and subsequent model year heavy-duty engines certified to an in-use monitoring performance ratio of 0.100 in accordance with CCR, title 13, section 1971.1(d)(3.2.2) shall not be considered nonconforming if the data collected from the engines in the test sample group indicate that the average in-use monitor performance ratio for one or more of the monitors in the test sample group is less than 0.100. Similarly, 2007 and subsequent medium-duty engines or vehicles certified to an in-use monitoring performance ratio specified in 13 CCR 1968.2 section (d)(3.2) shall not be considered non-conforming if the data collected from the engines or vehicles is less than the specified level of the aforementioned section.

(D.) *Modifications to the Base Engine's OBD System.* Any modifications made to the base engine's certified OBD system shall be solely for the purpose of preventing false malfunction determinations that could otherwise occur as a result of the integration of the hybrid system hardware and software, and such modifications shall only be made to the extent necessary to achieve this purpose. All modifications are subject to Executive Officer approval. The Executive Officer shall grant approval upon determining that the modifications are necessary and reasonable for the purposes of preventing false malfunction determinations on the converted vehicle or engine and the modifications do not prevent the certified base engine's OBD system from detecting when the base engine's monitored systems and components have a total lack of function. Any modifications that are made to a previously HD OBD or OBD II certified engine's OBD system or to the engine or aftertreatment system that can impact the performance of the OBD system will require revalidating the system and the affected monitor/s performance before Tier 1 approval can be granted. The revalidation testing shall be similar in scope to the verification of monitoring requirements described in 13 CCR 1971.1 section (l)(2) for

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heavy-duty engines and 13 CCR 1968.2 . Emission test data is not required. Before conducting validation testing, manufacturers shall submit a plan to the Executive Officer for review and approval that details the monitors to be tested, the test vehicle description, the testing methodology, the time line to collect the data, and the reporting format.

(E.) *Verification of Standardized Requirements:* In lieu of the test vehicle selection criteria specified in 13 CCR 1971.1 sections (1.2.1) through (1.2.3) for heavy-duty engines, the manufacturer shall test up to two unique production vehicles within an engine family.

(F.) *Verification and Reporting of In-use Monitoring Performance.* For testing described in section 1971.1 (l)(3), manufacturers shall submit a plan to the Executive Officer for review and approval that details the types and number of production vehicles to be tested, the sampling method, the time line to collect the data, and the reporting format. The Executive Officer shall approve the plan upon determining that it provides for effective collection of data from a sample of vehicles that, at a minimum, is ten percent of the total vehicle produced for sale in California, will likely result in the collection and submittal of data within the required time frame, will generate data that are representative of California drivers and temperatures, and 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.

(d) *Tier 2 Pilot Deployment Certification*

(1) A manufacturer must receive Executive Officer approval of its Hybrid Conversion System Pilot Deployment Application to sell up to Tier 2 California sales volumes identified in Table 1 of a hybrid conversion system.

(1.1) A manufacturer that demonstrates compliance with all Tier 1: Demonstration certification requirements pursuant to subsection 2208.2(c) may forgo Tier 1 certification and instead apply directly for Tier 2: Pilot Deployment certification.

(1.2) Hybrid conversion system eligibility for Tier 2 certification shall sunset as follows:

(A) As of January 1, 2022 for a hybrid conversion system that does not achieve at least 35 miles all-electric range.

(B) As of January 1, 2025 for a hybrid conversion system that does achieve at least 35 miles all-electric range.

(1.3) Eligibility for a hybrid conversion system that has received Tier 2 certification to be sold in California shall sunset as follows:

(A) As of January 1, 2027 for a hybrid conversion system that does not achieve at least 35 miles all-electric range.

(B) As of January 1, 2030 for a hybrid conversion system that does achieve at least 35 miles all-electric range.

(2) *Tier 2 Eligibility Requirements.*

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(2.1) *Emission Testing.* A hybrid conversion system must demonstrate a minimum ten percent CO₂ emission reduction and no increase in any criteria pollutant pursuant to the requirements of Attachment A to receive a Tier 2 or a Tier 3 certification.

(A) A manufacturer of a hybrid conversion system that demonstrates a minimum twenty percent CO₂ emission reduction and no increase in any criteria pollutant pursuant to the requirements of Attachment A shall receive an Executive Order identifying the hybrid conversion system as providing said CO₂ emission benefit.

1. A hybrid conversion system Executive Order issued for a Tier 1 or Tier 2 certified hybrid conversion system shall indicate that any identified potential CO₂ emission reductions from the hybrid conversion system are based upon a newly manufactured and installed hybrid conversion system, and that ARB makes no assertion regarding potential CO₂ emission impacts over the life of the hybrid conversion system or vehicle in which it is installed.

(B) Any potential CO₂ emission benefit identified or inferred by a hybrid conversion system Executive Order may not be used to demonstrate compliance with any rule, regulation or other air quality mandate, nor may it be credited as part of any emission averaging, banking or trading program.

(2.2) *Data Collection and Reporting.* Information required pursuant to subsection 2208.2(c)(2.3) shall be provided to ARB as part of the Tier 2 certification application, and shall be current as of 90 days prior to the Tier 2 application date.

(3) Tier 2 *On-Board Diagnostics Requirements.*

(A) *OBD System Requirements.* If the vehicle/engine to be retrofitted was certified with an OBD system, pursuant to sections 1968.2 or 1971.1, title 13 CCR, all applicable OBD requirements (e.g., monitoring standardization, in-use monitoring frequency, certification, demonstration) remain applicable with the exception of the allowances described in subsection (c)(2)(A)(1) through (7) below. As such, the proper function of the OBD system shall not be impaired as a result of the installation and operation of the hybrid retrofit system. This includes, but is not limited to, ensuring the converted vehicle's or engine's OBD system robustly detects malfunctions at the required emission thresholds, implements required monitors for applicable added or modified electronic hardware or emission controls, complies with standardization requirements, and is subject to required demonstration and production vehicle and engine testing. These requirements may necessitate modification of the original vehicle or engine OBD system. All modifications affecting OBD compliance including added, modified, or removed original vehicle hardware (e.g., components, wiring) or software (e.g., programming, calibration) must be fully documented and described as part of the hybrid system certification application.

1. *Monitoring Requirements.* All vehicles that qualify for Tier 2 certification flexibility are required to implement an EMD system on the hybrid system that meets the requirements described in 13 CCR 1971.1 section (d)(7.1.4).

2. *Standardization Requirements.* All heavy-duty hybrid conversion systems

and medium-duty hybrid conversion systems that have been approved for Tier 2 flexibility are exempt from the OBD standardization requirements described in 13 CCR 1971.1 section (h) and 13 CCR 1968.2 section (g).

3. Monitoring Conditions. 2013 and subsequent model year heavy-duty engines certified to an in-use monitoring performance ratio of 0.100 in accordance with Cal. Code Regs., title 13, section 1971.1(d)(3.2.2) shall not be considered nonconforming if the data collected from the engines in the test sample group indicate that the average in-use monitor performance ratio (IUMPR) for one or more of the monitors in the test sample group is less than 0.100. Similarly, 2007 and subsequent medium-duty engines or vehicles certified to an in-use monitoring performance ratio specified in 13 CCR 1968.2 section (d)(3.2) shall not be considered non-conforming if the data collected from the engines or vehicles is less than the specified level of the aforementioned section, however, the conversion system manufacturer is required to investigate the cause for the low IUMPR performance and develop a plan to improve the IUMPR performance to meet the 0.100 IUMPR requirement. A report detailing the issue and describing the IUMPR improvement plan shall be submitted to ARB within 1 year after Tier 2 approval.

4. Hybrid System Diagnostic Link Connector (HSDLC). If the vehicle includes a dedicated HSDLC to communicate with the hybrid diagnostic system, the HSDLC shall be distinguished from the base vehicle's OBD system DLC by locating the HSDLC in the vehicle interior to the right of the centerline of the vehicle.

5. OBD System Readiness Status Demonstration. In accordance with SAE J1979/J1939-73 specifications, all heavy-duty engine families are required to demonstrate their OBD system can be set to "complete" with no false detections of malfunctions since the fault memory was last cleared for each of the installed monitored components and systems identified in 13 CCR (1971.1) sections (e)(1) through (f)(9), and (g)(3) except (e)(11) and (f)(4). Similarly, all medium-duty vehicles are required to demonstrate the OBD system can be set to "complete" with no false detections of malfunctions since the fault memory was last cleared for each of the installed monitored components and systems identified in 13 CCR (1968.2) sections (e)(1) through (e)(8), (e)(13), (e)(15), (f)(1) through (f)(9), (f)(13), and (f)(15).

6. Modifications to the Base Engine's OBD System. Any modifications made to the base engine's certified OBD system shall be solely for the purpose of preventing false malfunction determinations that could otherwise occur as a result of the integration of the hybrid system hardware and software, and such modifications shall only be made to the extent necessary to achieve this purpose. All modifications are subject to Executive Officer approval. The Executive Officer shall grant approval upon determining that the modifications are necessary and reasonable for the purposes of preventing false malfunction determinations on the converted vehicle or engine and the modifications do not prevent the certified base engine's OBD system from detecting when the base engine's monitored systems and components have a total lack of function. Any modifications that are made to a previously HD OBD or OBD II certified engine's OBD system will

require revalidating the system and the affected monitors' performance according to the requirements described in section (c)(2.3)(D) before Tier 2 approval can be granted. Systems that are being carried-over from a previously approved Tier 1 system are exempt from further revalidation testing as long as the diagnostic system and vehicle are unchanged from the Tier 1 approved system and vehicle.

7. Monitoring System Demonstration Requirements for Certification.

a. OBD system demonstration requirements that are described in 13 CCR 1971.1 section (i) for heavy-duty engines and 13 CCR 1968.2 section (h) for medium-duty engines and vehicles are applicable except for the following allowances:

1. Number and Selection of Test Engines or Vehicles. The selection of test engines or vehicles shall be based on the criteria described in section III.A. through B. of the ARB aftermarket parts regulation, "Procedures for Exemption of Add-on and Modified Parts", amended June 1, 1990.

2. Monitors Required for Testing. To the extent feasible, aftermarket converter manufacturers must demonstrate a maximum of 3 major monitors that are subject to the OBD system demonstration testing requirements of 13 CCR 1971.1 sections (i)(3) and (i)(4) or 13 CCR 1968.2 sections (h)(3) and (h)(4). The monitors to be tested shall be selected by the Executive Officer after the conversion system manufacturer has completed its allotment of Tier 1 vehicles and follow the testing protocol in section (d)(2)(A)(7)(a)(3) below. Testing Protocol:

i. Prior to conducting the demonstration tests conversion manufacturers shall submit a test plan to the Executive Officer for review and approval that details the types and number of conversion vehicles to be tested, the test procedures including the pre-conditioning cycles, test cycles and fault implantation method, the implanted malfunction description (e.g., empty catalyst can), the time line to collect the data, and the reporting format the manufacturer shall submit a plan for providing emission test data to the Executive Officer for approval. The manufacturer shall not begin testing until the Executive Officer approves the test plan.

ii. Manufacturer receives approval of the test plan by the Executive Officer.

iii. Testing shall proceed with the following steps.

iv. Clear OBD Information: The OBD information shall be cleared prior to implanting the threshold for each monitor to be demonstrated.

v. Threshold Part: The threshold part for demonstrating the monitor shall be implanted prior to demonstration testing. The threshold part developed for the demonstration shall be representative of a part that has deteriorated to a point where it has minimal or no ability to perform its intended function (e.g., a total

restriction of the EGR valve when demonstrating EGR flow functionality).

vi. Drive Cycles: The demonstration can be done either on road or on the chassis dynamometer. Testing on the chassis dynamometer shall be demonstrated on either the heavy-duty vehicle urban dynamometer driving schedule (UDDS) (40 CFR, Part 86 Appendix I(a)) or heavy-duty transient test cycle (40 CFR, part 1037 Appendix I). Emission measurements are not required. The route used for on-road testing must be provided in the test report.

vii. Evaluation Protocol: The demonstration testing shall be continued until the fault code associated with the malfunction is stored and the MIL illuminated. Multiple drive cycles may be necessary to illuminate the MIL.

viii. Test Data Collection: OBD system data after each drive cycle for each monitor demonstration shall be recorded and provided to ARB with a report summarizing the results of the demonstration testing. The report must be submitted by the conversion manufacturer and approved by ARB to receive Tier 2 approval. For heavy-duty vehicle conversions, data requirements are described in 13 CCR 1971.1 section (i)(4.3). For medium-duty vehicle conversions, data requirements are described in 13 CCR 1968.2 section (h)(5.3).

8. *Production Engine or Vehicle Evaluation Testing. The production evaluation testing described in 13 CCR 1971.1 sections (l)(1) and (l)(3) and 13 CCR 1968.2 sections (j)(1) and (j)(3) is required to be revalidated for Tier 2 approval. Systems that are being carried-over from a previously approved Tier 1 system are exempt from further production engine or vehicle evaluation testing as long as the diagnostic system and vehicle are unchanged from the Tier 1 approved system and vehicle.*

a. Verification of Standardized Requirements. The testing described in 13 CCR 1971.1 section (l)(1) for heavy-duty engines and 13 CCR 1968.2 section (j)(1) for medium-duty vehicles must be completed and reported before Tier 2 approval can be granted.

b. Verification and Reporting of In-use Monitoring Performance. For the in-use monitoring performance testing described in 13 CCR 1971.1 section (l)(3) for heavy-duty engines and 13 CCR 1968.2 section (j)(3) for medium-duty vehicles, conversion manufacturers shall submit a plan to the Executive Officer for review and approval that details the types and number of conversion vehicles to be tested, the sampling method, the time line to collect the data, and the reporting format. The Executive Officer shall approve the plan upon determining that it provides for effective collection of data from a sample of vehicles that, at a minimum, is ten percent of the total vehicle produced for sale in California, will likely result in the collection and submittal of data within the required time frame, will generate data that are representative of California drivers and

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temperatures, and 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. Conversion manufacturers shall collect and report the data to ARB within twelve months after the converted vehicles were first produced. Failure to collect and submit the required data and/or non-compliance with the in-use performance ratios defined in 13 CCR 1971.1(d)(3.2) and 13 CCR 1968.2 (d)(3.2) may result in withdrawal of the exemption and vehicle recall.

(B) *Tier 3 OBD System Compliance Plan.* For all hybrid vehicle conversions that do not meet all of the requirements specified in subsection (e)(2), below, the manufacturer shall submit a compliance plan to meet Tier 3 OBD requirements to the Executive Officer for approval. The plan shall include data and engineering evaluations that describe the OBD system's current state of compliance compared to the Tier 3 requirements and the necessary improvements that are required for full Tier 3 compliance. The Executive Officer shall approve the plan if it is determined the manufacturer has demonstrated a good-faith effort to: (1) meet the requirements in full by evaluating and considering the best available monitoring technology; and (2) come into compliance as expeditiously as possible.

(e) Tier 3: Final Certification

(1) A manufacturer must receive Executive Officer approval of its Application for Hybrid Conversion System Final Certification in order for it to no longer be subject to the applicable hybrid conversion system California sales volume allocations identified in Table 1.

(1.1) A manufacturer that demonstrates compliance with all Tier 2: Pilot Deployment certification requirements pursuant to subsection 2208.2(d) may forgo Tier 2 certification and instead apply directly for Tier 3: Final certification.

(2) Tier 3 Eligibility Requirements.

(2.1) *Emission Testing.* A hybrid conversion system shall comply with emission test requirements of subsection 2208.2(d)(2.1).

(2.2) *Data Collection and Reporting.* Information required pursuant to subsection 2208.2(c)(2.3) shall be provided to ARB as part of the Tier 3 certification application and shall be current as of 90 days prior to the Tier 3 application date.

(3) Tier 3 On-Board Diagnostics Requirements.

(A) *OBD System Requirements.* All applicable OBD system requirements of section 1968.2 or 1771.1, title 13 CCR (e.g., monitoring standardization, in-use monitoring frequency, certification, demonstration) for the base engine and vehicle remain applicable with the exception of the allowances described in subsection (d)(2)(A)(1)

through (9) below. As such, the proper function of the OBD system shall not be impaired as a result of the installation and operation of the hybrid retrofit system. This includes, but is not limited to, ensuring the converted vehicle's or engine's OBD system robustly detects malfunctions at the required emission thresholds, implements required monitors for applicable added or modified electronic hardware or emission controls, complies with standardization requirements, and is subject to required demonstration and production vehicle and engine testing. These requirements may necessitate modification of the original vehicle or engine OBD system. All modifications affecting OBD compliance including added, modified, or removed original vehicle hardware (e.g., components, wiring) or software (e.g., programming, calibration) must be fully documented and described as part of the hybrid system certification application.

1. *Monitoring Requirements.* For all added electronic hybrid components/systems that either provide input (directly or indirectly) to or receive commands from the on-board hybrid system computer(s), and meet the definition of a comprehensive component according to 13 CCR 1971.1 for heavy-duty engines or 13 CCR 1968.2 for medium-duty vehicles or engines, shall comply with the monitoring requirements of 13 CCR 1971.1 section (g)(3) or 13 CCR 1968.2 section (e)(15) or (f)(15) depending on the vehicle or engine being converted.

2. *Hybrid System Diagnostic Link Connector (HSDLC).* If the vehicle includes a dedicated HSDLC to communicate with the hybrid diagnostic system, the HSDLC shall be distinguished from the base vehicle's OBD system DLC by locating the HSDLC in the vehicle interior to the right of the centerline of the vehicle.

3. *OBD System Readiness Status Demonstration.* In accordance with SAE J1979/J1939-73 specifications, all heavy-duty hybrid engine families that have been approved for Tier 1 flexibility are required to demonstrate the OBD system can be set to "complete" with no false detections of malfunctions since the fault memory was last cleared for each of the installed monitored components and systems identified in 13 CCR (1971.1) sections (e)(1) through (f)(9), and (g)(3) except (e)(11) and (f)(4). Similarly, all medium-duty vehicles are required to demonstrate the OBD system can be set to "complete" with no false detections of malfunctions since the fault memory was last cleared for each of the installed monitored components and systems identified in 13 CCR (1968.2) sections (e)(1) through (e)(8), (e)(13), (e)(15), (f)(1) through (f)(9), (f)(13), and (f)(15).

4. *OBD System Modifications.* Any modifications that are made as part of the aftermarket conversion to a previously HD OBD or OBD II certified engine's OBD system or engine or aftertreatment system will require revalidating the system and the affected monitors' performance before Tier 3 approval shall be granted. Affected monitors that are subject to the OBD system demonstration testing requirements of 13 CCR 1971.1 sections (i)(3) and (i)(4) or 13 CCR 1968.2 sections (h)(3) and (h)(4) will have to be revalidated according to the aforementioned sections except that in lieu of a full useful life test vehicle, the test vehicle may be a low-mileage vehicles that is fitted with bench-aged parts or road-aged parts.

5. *Monitoring System Demonstration Requirements for Certification.*

a. Except as described in (e)(5)(a)(1) below the OBD system demonstration requirements that are described in section (d)(7) are applicable for Tier 3 vehicles.

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1. **Monitors Required for Testing.** To the extent feasible, aftermarket converter manufacturers must demonstrate a maximum of 5 major monitors that are subject to the OBD system demonstration testing requirements of 13 CCR 1971.1 sections (i)(3) and (i)(4) or 13 CCR 1968.2 sections (h)(3) and (h)(4). The monitors selected for testing are subject to the OBD system demonstration testing requirements of 13 CCR 1971.1 sections (i)(3) and (i)(4) or 13 CCR 1968.2 sections (h)(3) and (h)(4) except that in lieu of a full useful life test vehicle, the test vehicle may be a low-mileage vehicles that is fitted with bench-aged parts or road-aged parts.

2. The monitors to be tested shall be selected by the Executive Officer after the conversion system manufacturer has completed its allotment of Tier 2 vehicles or after the manufacturer has informed the Executive Officer of its intent to request Tier 3 approval of its conversion system . Monitors that were previously demonstrated according to section (e)(2)(A)5 above are not required to be redemonstrated. Prior to conducting the demonstration tests conversion manufacturers shall submit a test plan to the Executive Officer for review and approval that details the types and number of conversion vehicles to be tested, vehicle aging methods, the test procedures including the pre-conditioning cycles, test cycles and fault implantation method, threshold part development, the time line to collect the data, and the reporting format the manufacturer shall submit a plan for providing emission test data to the Executive Officer for approval. The manufacturer shall not begin testing until the Executive Officer approves the test plan.

6. *Production Engine Evaluation Testing.* Production evaluation testing described in 13 CCR 1971.1 sections (l)(1) through (l)(3) and 13 CCR 1968.2 sections (j)(1) through (j)(3) will need to be revalidated and the data collected and reported to ARB before Tier 3 approval is granted.

a. Verification of Standardized Requirements. The testing described in 13 CCR 1971.1 section (l)(1) for heavy-duty engines and 13 CCR 1968.2 section (j)(1) for medium-duty vehicles must be completed and reported before Tier 2 approval can be granted.

b. Verification of Monitoring Requirements. The testing described in 13 CCR 1971.1 section (l)(2) for heavy-duty engines and 13 CCR 1968.2 section (j)(2) for medium-duty vehicles is required for all monitors except circuit continuity and out-of-range diagnostics unless these diagnostics have been modified from their original as new system design or for any other monitors which are impacted by the addition of the hybrid system. Manufacturers are not required to test diagnostics that were previously demonstrated prior to certification as required in section (e)(5). The manufacturer may request Executive Officer approval to be exempt from repeating the production vehicle tests to revalidate the performance of one or monitors. The Executive Officer shall approve the exemption upon the manufacturer submitting data and/or

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analysis demonstrating that the monitoring performance is not negatively impacted by the modifications.

c. *Verification and Reporting of In-use Monitoring Performance.* For the in-use monitoring performance testing described in 13 CCR 1971.1 section (l)(3) for heavy-duty engines and 13 CCR 1968.2 section (j)(3), conversion manufacturers shall submit a plan to the Executive Officer for review and approval that details the types and number of conversion vehicles to be tested, the sampling method, the time line to collect the data, and the reporting format. The Executive Officer shall approve the plan upon determining that it provides for effective collection of data from a sample of vehicles that, at a minimum, is ten percent of the total vehicle produced for sale in California, will likely result in the collection and submittal of data within the required time frame, will generate data that are representative of California drivers and temperatures, and 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. Conversion manufacturers shall collect and report the data to ARB within twelve months after the converted vehicles were first produced. Failure to collect and submit the required data and/or non-compliance with the in-use performance ratios defined in 13 CCR 1971.1(d)(3.2) and 13 CCR 1968.2 (d)(3.2) may result in withdrawal of the exemption and vehicle recall.

(f) *Approval*

(1.) *Issuance of Executive Orders.*

If, after reviewing the test data and other information submitted by the applicant, the Executive Officer determines that the hybrid conversion system meets the requirements of these procedures, he or she shall issue an Executive Order certifying the hybrid conversion system for sale and installation on the vehicles and engines with the test groups or engine families specified in the certification application.

(2.) *Carry-Over and Carry-Across.*

(A.) Carry-over of emission test data from the previous model year to the following model year and from one test group or engine family to similar test groups or engine families will be allowed if the Executive Officer determines that the carry-over/across data will adequately represent the emission performance of the hybrid conversion system to be certified.

(B.) Requests for carry-over and carry-across must be accompanied by an engineering analysis that shall include test data demonstrating that the emissions performance of the hybrid conversion system and the test group or engine family for which the certification is sought will be adequately represented by the emission performance of the hybrid conversion system and test group or engine family, and other relevant information. The Executive Officer may request applicable additional information needed to make a decision..

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(3) *Updated Parts or Calibrations.* Changes made to the design or operating conditions of a hybrid conversion system must be reviewed and approved by the Executive Officer. Changes to the design or operating conditions of the hybrid conversion system not approved in advance by the Executive Officer shall invalidate the hybrid conversion system certification at his or her sole discretion.

Potential warranty, reporting and recall provisions, below, are intended to provide ARB a mechanism to address conversion systems that are malfunctioning or not achieving anticipated benefits in-use. The potential provisions described in (g) and (h) are similar to what is required for diesel emission control system verification.

(g) *Warranty Requirements*

(1) *Product Warranty.*

(A) The applicant must warrant to all owners, for ownership within the warranty period and lessees, for lease contracts within the warranty period that its hybrid conversion system is free from defects in design, materials, workmanship, or operation.

(B) The repair or replacement of any ggj part otherwise eligible for warranty coverage shall be excluded from such warranty coverage if the hybrid conversion system, vehicle or engine has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for the repair or replacement of the part.

(C) Failure of the vehicle or engine owner to ensure scheduled maintenance or to keep maintenance records for the vehicle, equipment, engine, or hybrid conversion system may, but shall not per se, be grounds for disallowing a warranty claim.

(2) *Installation Warranty.*

(A) A person or company who installs a hybrid conversion system must warrant that the installation is free from defects in workmanship or materials which cause the hybrid conversion system to fail to conform to the emission performance level for which it was approved for the conversion system warranty period.

(B) The installation warranty period is three years or 50,000 miles, whichever comes first. The installation warranty must cover the full repair or replacement cost of the hybrid conversion system, including parts and labor.

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Table 2: Minimum Manufacturer Warranty Periods	
Conversion System Approval Level	Hybrid conversion system minimum warranty period
Tier 1	3 years or 50,000 miles, whichever comes first ¹
Tier 2	5 years or 60,000 miles, whichever comes first ¹
Tier 3	7 years or 75,000 miles, whichever comes first ²
1 – Hybrid conversion systems with ePTO may include a 3,000 hour warranty period in lieu of a minimum mileage. 2 – Hybrid conversion systems with ePTO may include a 4,200 hour warranty period in lieu of a minimum mileage.	

(3) *Product Warranty Statement.* The applicant must furnish a copy of the following statement in the owner's manual, a copy of which must be provided to each owner upon delivery of the hybrid conversion system. The applicant may include descriptions of circumstances that may result in a denial of warranty coverage, but these descriptions shall not limit warranty coverage in any way.

YOUR WARRANTY RIGHTS AND OBLIGATIONS

(Applicant's name) must warrant the hybrid conversion system to be free from defects in design, materials, workmanship, or operation which cause significant degradation in emissions or fuel economy performance during the system warranty period, provided there has been no abuse, neglect, improper maintenance, or improper operation of your hybrid conversion system or vehicle, as specified in the owner's manuals. Where a warrantable condition exists, (applicant's name) will repair or replace your hybrid conversion system at no cost to you, including diagnosis, parts, and labor. The warranty period for this hybrid conversion system is (years or miles of operation) whichever occurs first.

As the vehicle owner or operator, you are responsible for performing the required maintenance described in your owner's manual. (Applicant's name) recommends that you retain all maintenance records and receipts for maintenance expenses for your vehicle, engine, or hybrid conversion system. If you do not keep your receipts or fail to perform all scheduled maintenance, (applicant's name) may have grounds to deny warranty coverage. You are responsible for presenting your vehicle, engine, and hybrid conversion system to a (applicant's name) dealer or representative as soon as a problem is detected. The warranty repair or replacement should be completed in a reasonable amount of time, not to exceed 30 days. If you have questions regarding your warranty rights and responsibilities, you should contact (Insert chosen applicant's contact) at 1-800-xxx-xxxx or the California Air Resources Board at 9528 Telstar Avenue, El Monte, CA 91731, or (800) 363-7664, or electronic mail: helpline@arb.ca.gov.

(4) *Warranty Notification.* For all hybrid conversion systems, the manufacturer shall notify the hybrid conversion system purchaser or leaser in writing that installation of the hybrid conversion system may affect the original vehicle manufacturer's warranty. Acknowledgement of receipt of this notification must be signed by the purchaser prior to

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sale of the hybrid conversion system, must be maintained by the applicant for the duration of the warranty period, and must be supplied upon request of the Executive Officer, within ten days of such request.

(5) *Installation Warranty Statement.* The installer must furnish the owner with a copy of the following statement.

YOUR WARRANTY RIGHTS AND OBLIGATIONS

(Installer's name) must warrant that the installation of a hybrid conversion system is free from defects in design, materials, workmanship, or operation of the hybrid conversion system which cause significant degradation in emissions or fuel economy performance during the system warranty period, provided there has been no abuse, neglect, improper maintenance, or improper operation of your hybrid conversion system or vehicle, as specified in the owner's manuals. The warranty period and the extent of the warranty coverage provided by (installer's name) must be the same as the warranty provided by the product manufacturer, and the same exclusions must apply.

(6) *Hybrid Conversion System Warranty Report.* The applicant must submit a warranty report to the Executive Officer within 30 calendar days if, at any time, the cumulative number of valid warranty claims for the same part or component of the hybrid conversion system in California exceeds one percent of the cumulative California sales or leases for the hybrid conversion system or ten units sold within California, whichever is greater. Where valid warranty claims exceed one percent of California sales or ten units sold in California, whichever is greater, the Executive Officer may deny Tier 2 or Tier 3 certification of the hybrid conversion system, or modify, revoke or suspend the existing ARB certification. Where valid warranty claims exceed four percent of California sales or twenty five units sold in California, whichever is greater, the Executive Officer may order a recall per the requirements of subsection 2208.2(h.) of this regulation. The warranty report must include the following information and shall be submitted in the format specified by the Executive Officer:

(A) The manufacturers corporate name, California sales for the given calendar year and cumulative California sales, and California leases for the given calendar year and cumulative California leases of the hybrid conversion system.

(B) Production for the given calendar year and cumulative production of the hybrid conversion system.

(C) Annual summary of California warranty claims for the given calendar year. The summary must include:

1. A description of the nature of the claims and of the warranty replacements or repairs. The applicant must categorize warranty claims for each hybrid conversion system by the part(s) or component(s) replaced or repaired.

2. The number and percentage of hybrid conversion systems for which a warranty replacement or repair was identified.

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3. A short description of the hybrid conversion system part or component that was replaced or repaired under warranty and the most likely reason for its failure.

4. For each part or component replaced or repaired under warranty, the number of annual and cumulative replacements or repairs of each part or component.

5. Name, physical business address, business email address and business phone number of the end-user that filed the warranty claim and, if applicable, company name. If personal, not business, information is given, the applicant shall identify it as such.

6. Date the warranty claims were filed and the engine family and vehicle vocation the hybrid conversion system were used with.

7. Delineate the reason(s) for any instances in which warranty service is not provided to end-users that file warranty claims.

8. A current list of authorized installers for the hybrid conversion system and business contact information.

(D) An applicant that fails to submit a complete hybrid conversion system warranty report within 30 calendar days for valid warranty claims in excess of four percent for the same part or component, may be subject to civil penalties as specified in state law and regulations, including, but not limited to, Health and Safety Code Sections 39600, 39660, and 39674.

(E) A hybrid conversion system warranty report that does not contain all required information will not be considered complete. A hybrid conversion system warranty report will be considered to be complete as of the date that all required information is submitted.

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(h.) Recall Provisions

(1) If the Executive Officer determines, after a review of an applicant's warranty report or any other information, that a hybrid conversion system has the potential to experience catastrophic failure or other safety related failure for the same part or component of the hybrid conversion system, has valid warranty claims in excess of four percent of California sales or 25 units sold in California, whichever is greater, or a substantial number of units experience a failure of an operational feature, the Executive Officer shall require the manufacturer to submit a recall plan and conduct a recall. In the event of a recall the Executive Officer shall provide notification to the applicant that includes a description of the nature of the failure or warrantable condition, the factual basis for the determination, and shall designate a date at least 60 days from the date of receipt of such notification by which the applicant shall submit a recall plan for review and approval to address the failures or warrantable condition. Each recall plan must be approved by the Executive Officer in writing.

(2) *Recall Plan.* At a minimum, an applicant's recall plan shall contain the following information, unless otherwise specified in the Executive officer's recall notification:

(A) A description of each hybrid conversion system subject to the recall including the number of units to be recalled, the conversion system(s) affected, and any information required to identify the recalled units.

(B) A description of the type and nature of the failure or warrantable condition and the specific modifications, design changes, alterations, repairs, adjustments, or other changes to be made to correct the failures or warrantable condition with a description of the technical studies, data, or other information which support the applicant's decision regarding specific corrections to be made.

(C) A description of the method by which the applicant will determine the names and addresses of the end users and the applicant's methods and schedule for notifying the end users, service facilities, and distributors.

(D) A description of the procedure to be followed by the end users to correct the failures or warrantable condition. This shall include the date on or after which the end user can have the failures or warrantable condition remedied, the time necessary to perform the remedy, and the designation of facilities at which the remedy can be performed.

(E) The recall plan may specify the maximum incentives, if any, the applicant will offer to induce vehicle or equipment owners to present their hybrid conversion system for repair, as evidence that the manufacturer has made a good faith effort to repair or replace all the hybrid conversion systems in the plan. The plan shall include a schedule for implementing actions to be taken, including identified increments of progress towards implementation and deadlines for completing each such increment.

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(F) A copy of the letter of notification to be sent to the end users.

(G) A description of the system by which the applicant will assure that an adequate supply of parts will be available to perform any repairs under the recall plan, including the date by which an adequate supply of parts will be available to initiate the repair or replacement campaign, and the method to be used to assure that the supply remains both adequate and responsive to end user demand.

(H) A copy of all necessary instructions to be sent to those persons who perform the replacement or repair.

(2) *Recall Reporting Requirements.* Unless otherwise specified by the Executive Officer, the manufacturer shall report on the progress of a recall campaign by submitting subsequent reports for six consecutive quarters commencing with the quarter after the recall campaign begins. Such reports shall be submitted no later than 25 days after the close of each calendar quarter to:

Chief
Emissions Compliance Automotive Regulations and Science Division
9528 Telstar Avenue,
El Monte, California 91731