# APPENDIX G

# PROPOSED LANGUAGE FOR AFTERMARKET PARTS CERTIFICATION OF OFF VEHICLE CHARGE CAPABLE HYBRID ELECTRIC VEHICLES

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State of California
AIR RESOURCES BOARD

# CALIFORNIA CERTIFICATION AND INSTALLLATION PROCEDURES FOR OFF-VEHICLE CHARGE CAPABLE CONVERSION SYSTEMS FOR 2000 AND SUBSEQUENT MODEL YEAR HYBRID ELECTRIC VEHICLES

[Note: All text is proposed for adoption. As permitted by section 8, title 2, California Code of Regulations, the proposed text is not underlined for ease of review.]

Adopted: [INSERT DATE OF ADOPTION]

Note: These procedures are incorporated by reference into section 2032, title 13, California Code of Regulations (CCR).

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California Certification and Installation Procedures for Off-Vehicle Charge Capable Conversion Systems for 2000 and Subsequent Model Year Hybrid Electric Vehicles.

1. APPLICABILITY

(a) "California Certification and Installation Procedures for Off-Vehicle Charge Capable Conversion Systems for 2000 and Subsequent Model Year Hybrid Electric Vehicles" (these Procedures) apply to off-vehicle charge capable conversion systems designed for installation on 2000 and subsequent model year hybrid electric vehicles in the passenger car, light-duty truck, and medium-duty vehicle classes.

(b) Hybrid electric vehicles converted to incorporate off-vehicle charging are not eligible for zero emission vehicle credits under sections 1962 and 1962.1, title 13, CCR.

(c) Certification of off-vehicle charge capable conversion systems issued pursuant to these Procedures shall have the effect of an exemption issued pursuant to Vehicle Code Sections 27156 and 38391.

2. DEFINITIONS

"Advanced technology partial zero emission vehicle" means any partial zero emission vehicle with an allowance greater than 0.2 before application of the partial zero emission vehicle early introduction phase-in multiplier under section 1962 or 1962.1, CCR.

"Driveability" of a vehicle means the smooth delivery of power, as demanded by the driver. Typical causes of driveability degradation are rough idling, misfiring, surging, hesitation, or insufficient power.

"Hybrid electric vehicle" means any vehicle that can draw propulsion energy from both of the following on-vehicle sources of stored energy: 1) a consumable fuel and 2) an energy storage device such as a battery, capacitor, or flywheel.

"Installer" means a person authorized by the manufacturer to install the manufacturer's off-vehicle charge capable conversion system on a motor vehicle.

"Off-vehicle charge capable" or "OVCC" means having the capability to charge a battery from an off-vehicle electric energy source that cannot be connected or coupled to the vehicle in any manner while the vehicle is being driven.

"Off-vehicle charge capable conversion system" or "conversion system" means a package of zero emission vehicle energy storage device and charger, control modules, and any other vehicle/engine components that are modified, removed, or

added during the process of modifying a hybrid electric vehicle to an off-vehicle charge capable hybrid electric vehicle.

"Off-vehicle charge capable conversion system manufacturer" or "manufacturer" means a person who manufactures, assembles, imports, packages, or repackages an off-vehicle charge capable conversion system for sale in California and requests or is granted the Executive Order certifying the off-vehicle charge capable conversion system.

"Partial zero emission vehicle" or "PZEV" means any vehicle that is delivered for sale in California and that qualifies for a partial zero emission vehicle allowance of at least 0.2 under sections 1962 or 1962,1, title 13, CCR.

"Useful life" for purposes of these Procedures, means the duration, expressed in miles, of the longest durability period for the new vehicle emission standards to which the hybrid electric vehicle was certified.

"Zero emission vehicle" means any vehicle certified to zero emission standards under sections 1962 or 1962.1, title 13, CCR.

"Zero emission vehicle energy storage device" means batteries and other electric energy storage devices.

3. GENERAL REQUIREMENTS

In addition to all other standards or requirements imposed, the following general requirements shall apply to all conversion systems to be certified for installation on hybrid electric vehicles:

(a) *On-Board Diagnostic (OBD) System Compatibility*:
If the vehicle to be converted was certified with an OBD system pursuant to section 1968.1, or 1968.2, title 13, CCR, the converted vehicle shall also be required to comply with and be certified to the same applicable OBD regulation. This includes, but is not limited to, ensuring the converted vehicle robustly detects malfunctions at the required emission thresholds, meets the required minimum monitoring frequency, implements required monitors for applicable added electronic hardware or emission controls, complies with standardization requirements, and conducts required demonstration and production vehicle testing. This requirement may necessitate modification of the original vehicle OBD system and/or addition of more diagnostics to supplement the original vehicle OBD system. All modifications affecting OBD compliance including added, modified, or original vehicle hardware (e.g., components, wiring) or software (e.g., programming, calibration) must be fully documented as part of the conversion system application for certification.

(b) *Driveability* :

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

(c) *Emission Control Label*:
California motor vehicle emission control label specifications, incorporated by reference in section 1965, title 13, CCR, shall apply to installations of conversion systems, with the following additions:

(i) The manufacturer 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 Vehicle 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.

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

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

(i) Description of the conversion system, including wiring diagrams and descriptions of major components and their theory of operation;

(ii) Charging procedure;

(iii) Listing of necessary service and service intervals, as well as tune-up data, which differ from the service requirements specified by the vehicle's original manufacturer;

(iv) Name, address, and phone number of the 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 conversion system; and

(v) Warranty information.

(e) *Manufacturer Recordkeeping Requirement*:
The manufacturer of a conversion system shall maintain a record of the vehicle identification numbers and California license plate numbers of those vehicles on which the conversion system has been installed. As part of this record, the manufacturer shall identify the installation date and the certification Executive Order number of the conversion system installed on each vehicle and shall identify the vehicles' owners at the time of installation, including the owners' current addresses and phone numbers. The manufacturer shall supply a copy of all installation information to the Executive Officer upon request.

(f) *Installer Recordkeeping Requirement*:
The installer of a conversion system shall maintain a record as specified in paragraph 3(e) of these Procedures and shall provide this information to manufacturers upon request.

4. REQUEST FOR CERTIFICATION

(a) Request for certification of a conversion system shall be submitted in writing by the manufacturer, or its authorized representative, intending to offer the conversion system for sale in California.

(b) The request shall include all the information required pursuant to these Procedures, including:

(i) Identification and description of the test groups for which the conversion system to be certified is designed;

(ii) Complete description of the conversion system, including detailed wiring diagrams and parts list; explanation on how the conversion system interacts with or integrates into the original vehicle; all the necessary modifications to the vehicle and its OBD system; sample of the supplemental emission control information label; owner's manual; warranted parts list; and samples of warranty statements;

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

(iv) Agreement to supply the Air Resources Board, within 45 calendar days of the Executive Officer's request, with any one or more of the vehicles used for certification testing or to provide Air Resources Board personnel with the equipment to inspect and test such vehicles at the manufacturer's facility, if requested by the Executive Officer;

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

(vi) Test data.

5. TEST PROCEDURES

(a) *Test Procedures for OVCC Converted Vehicles*:
Test procedures set forth in the "California Exhaust Emission Standards and Test Procedures for 2005 Through 2008 Model Zero-Emission Vehicles and 2001 Through 2010 Hybrid Electric Vehicles in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes," as incorporated by reference in section 1962, title 13, CCR; the "California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes," as incorporated by reference in section 1962.1, title 13, CCR; the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," as incorporated by reference in section 1976, title 13, CCR, and the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," as incorporated by reference in section 1978, title 13, CCR, shall be used to determine the emission levels of OVCC converted vehicles.

(b) *Applicable Standards*:
The conversion system shall meet the emission standards for the model year of original manufacture and certification. The conversion system must also be durable for the useful life of the vehicle. The manufacturer shall demonstrate compliance with these requirements through durability and emission testing.

(c) *Demonstration of Durability*:
The manufacturer shall propose a durability program for advance approval by the Executive Officer. The durability program shall consist of:

(i) Whole vehicle full mileage accumulation or whole vehicle accelerated mileage accumulation over the useful life or equivalent useful life of the

vehicle; bench aging of individual components or systems over the useful life of the vehicle; or alternative methods that would effectively predict the deterioration of the converted vehicle over its useful life.

(ii) A maximum of one durability data vehicle per test group for which certification is sought shall be required.

(iii) The vehicle is assumed to have zero miles at the time of conversion. Vehicle mileage accumulation shall be conducted using vehicle drive patterns found in actual use.

(iv) Bench aging shall simulate component or system aging under vehicle drive patterns and operational conditions found in actual use. The list of components or systems to be aged and their aging techniques must be approved in advance by the Executive Officer. Approval of bench aging and alternative methods shall be contingent upon a demonstration by the manufacturer that they result in deterioration at least as great as the deterioration from vehicle mileage accumulation.

(d) *Demonstration of Emission Compliance*:
The manufacturer shall propose the procedures for determining compliance with the emission standards for advance approval by the Executive Officer. Emission compliance shall be determined by:

(i) Testing a vehicle aged with the conversion system; installing aged components or systems on an emission data vehicle prior to testing; or using alternative methods that would effectively predict the useful life emissions of the converted vehicle.

(ii) A maximum of one emission data vehicle per test group for which certification is sought shall be required.

(iii) Alternative methods must be approved in advance by the Executive Officer.

(e) Prior to the commencement of testing, the choice of durability data vehicle and emission data vehicle must be approved by the Executive Officer as being representative of the range of test groups for which certification is sought.

6. APPROVAL

(a) *Issuance of Executive Orders*:
If, after reviewing the test data and other information submitted by the manufacturer, the Executive Officer determines that the conversion system meets the applicable emission standards demonstrated under an approved test plan, an Executive Order shall be issued certifying the conversion system for

sale and installation on the vehicles with the test groups specified in the certification request.

(b) *Carry-Over and Carry-Across*:

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

(ii) Requests for carry-over and carry-across must be accompanied by an engineering analysis demonstrating that the durability and emission performance of the conversion system and the test group for which certification is sought will be adequately represented by a certified conversion system/test group.

7. WARRANTY REQUIREMENTS

(a) *Requirements of Manufacturers*:

Each manufacturer of a conversion system shall warrant to the person having the vehicle converted and to each subsequent purchaser of the vehicle that the conversion system is designed and manufactured to conform with the applicable requirements of these Procedures and is free from defects in materials and workmanship which cause the conversion system to fail to conform with the applicable requirements of these Procedures or cause damage to any part on the converted vehicle. This warranty requirement will be effective for the applicable warranty period specified in section 2037(b), title 13, CCR, from the date of installation if the conversion system is installed on the vehicle within four years of the date the vehicle is first acquired by an ultimate purchaser. If the conversion system is installed on the vehicle after four years of the date the vehicle is first acquired by an ultimate purchaser, the warranty period will be three years or half the applicable warranty period mileage specified in section 2037(b), title 13, CCR, whichever occurs first from the date of installation. For PZEVs, this warranty requirement will be effective for the applicable warranty period specified in section 1962(c) or section 1962.1(c), title 13, CCR, from the date of installation if the conversion system is installed on the vehicle within six years of the date the vehicle is first acquired by an ultimate purchaser. If the conversion system is installed on the PZEV after six years of the date the vehicle is first acquired by an ultimate purchaser, the warranty period will be five years or half the applicable warranty period mileage specified in section 1962(c) or section 1962.1(c), title 13, CCR, whichever occurs first from the date of installation. This warranty shall cover customer service and the full repair or replacement costs including the costs of diagnosis, labor, and parts, including any part on the converted vehicle that is damaged due to a defect in the conversion system.

(b) *Requirements of Installers*:
Each installer of a conversion system shall warrant to the person having the vehicle converted and to each subsequent purchaser of the vehicle that the conversion system will not fail to conform with the applicable requirements of these Procedures due to incorrect installation and that no part on the converted vehicle will be damaged due to incorrect installation. Installers of conversion systems shall install only those systems of a certified configuration and shall agree to indemnify the person having the vehicle converted and to each subsequent purchaser of the vehicle for the cost of repair of any vehicle upon which a noncertified configuration was installed. In addition, the installer shall agree to indemnify the person having the vehicle converted and to each subsequent purchaser of the vehicle for any tampering fines that may be imposed as a result of improper installation of the conversion system. The warranties and agreements to indemnify shall be effective for the applicable warranty period specified in section 2037(b)(2), title 13, CCR. This warranty shall cover customer service and the full repair or replacement costs including the cost of diagnosis, labor, and parts, including any part on the converted vehicle that is damaged due to incorrect installation of the conversion system. Before an installer installs a conversion system, the installer shall submit to ARB a sample of the warranty statement to be provided by the installer as specified above.

8. IN-USE TESTING REQUIREMENTS

The Air Resources Board may select up to five conversion systems per manufacturer per year for in-use testing. The manufacturer must provide the in-use OVCC converted vehicle(s) selected by the Air Resources Board to be sent to the Air Resources Board facility or a designated independent laboratory for testing in accordance with the test procedures in paragraph (5)(a) of these Procedures. Testing costs will be borne by the Air Resources Board, except for those conversion systems that do not comply with the applicable emission standards. If one or more of the conversion system fails to meet the applicable emission standards in an applicable test vehicle, the Air Resources Board may rescind a previously granted Executive Order, request further analysis and data from the manufacturer, or require, at the manufacturer's expense, additional vehicles to be tested. Additional vehicles to be tested shall be limited to no more than five for each failed conversion system.