

JULY 16, 2008 Draft

State of California
AIR RESOURCES BOARD

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

Adopted: October xx, 2008

Note: All text is new and for simplicity is not underlined.

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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 “credits.”
- (c) Certification of off-vehicle charge capable conversion systems issued pursuant to these regulations shall have the effect of an exemption issued pursuant to Vehicle Code Section 27156.

2. DEFINITIONS

“Advanced Technology Partial Zero Emission Vehicle” or **“ATPZEV”** means any PZEV with an allowance greater than 0.2 before application of the PZEV early introduction phase-in multiplier.

“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.

“Installer” means a person authorized by the manufacturer to install an off-vehicle charge capable conversion system on 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 or assembles 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.

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“Partial zero emission vehicle” or “PZEV” means any vehicle that is delivered for sale in California and that qualifies for a partial ZEV allowance of at least 0.2.

“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 vehicle was certified.

“Zero emission vehicle” or **“ZEV”** means any vehicle certified to zero emission standards.

“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 OVCC conversion systems to be certified for installation on California-certified HEVs:

- (a) **On-board Diagnostic (OBD) System Compatibility:**
If the vehicle to be converted was certified with an OBD system pursuant to Section 1968, 1968.1, 1968.2, or 1968.5, Title 13, California Code of Regulations (CCR), the proper function of the OBD system shall not be impaired as a result of the installation and operation of the conversion system. This requirement may necessitate modification of the OBD system to prevent it from storing erroneous trouble codes. All modifications to OBD components, programming or wiring, must be fully specified as parts of the conversion system. If the conversion system includes modifications to the OBD system, the applicant must submit an analysis showing that these modifications will not adversely affect OBD performance.
- (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 applicant.
- (c) **Emission Control Labels:**
“California Motor Vehicle Emission Control Label Specifications,” incorporated by reference in Title 13, CCR, Section 1965, shall apply to installations of OVCC conversion systems, with the following additions:
 - (i) The OVCC conversion system 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

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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; the conversion system manufacturer's name, address, and telephone number; and shall state that the converted vehicle complies with California emission requirements. 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 for 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 (converted vehicle odometer reading) and date at which the conversion system warranty expires. The label shall also clearly state that the vehicle has been equipped with an OVCC conversion system. It is not necessary for emission control information labels installed with conversion systems to be machine readable.
- (d) **Owner's Manuals:**
Each OVCC conversion system installed shall include an owner's manual containing at least the following information:
 - (i) a brief description of the conversion system, including a wiring diagram and a description of major components and their theory of operation;
 - (ii) the correct charging procedure;
 - (iii) 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 original manufacturer;
 - (iv) the 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's Recordkeeping Requirement:**
Manufacturers of OVCC conversion systems shall maintain a record of the vehicle identification numbers and California license plate numbers of those vehicles on which their product has been installed. As part of this record, manufacturers shall identify the installation date and the certification Executive Order number of those systems installed on each vehicle and shall identify the vehicles' owners at the time of installation, including the owners' current addresses and phone numbers at the time of installation. Manufacturers shall supply a copy of all installation information to the Executive Officer upon request.
- (f) **Installer Recordkeeping Requirement:**
Installers of OVCC conversion systems shall maintain a record as specified in paragraph 3(e) and shall provide this information to OVCC conversion system manufacturers upon request.

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4. REQUEST FOR CERTIFICATION

- (a) A request for certification of an OVCC conversion system may be submitted by an authorized representative of the OVCC conversion system manufacturer intending to offer the conversion system for sale or installation in the State of California.
- (b) A separate request shall be required for each model year, even though the emission standards for certifying new vehicles may be the same for consecutive model years. The request shall include all test data and other information required pursuant to these Procedures.
- (c) The request for certification shall be submitted in writing, signed by an authorized representative of the OVCC conversion system manufacturer, and shall include the following:
 - (i) Identification and description of the test groups for which the OVCC conversion system to be certified is designed; the emission standards applicable to those test groups.
 - (ii) A complete description of the OVCC conversion system including details of the wiring diagram; parts list; a sample of the supplemental emission control information label as specified in 3(c); warranted parts list; sample of the warranty statements as specified in 7(a) and 7(b); and all necessary modification to the engine, emission control system, or other parts of the vehicle.
 - (iii) Procedures for installing and maintaining the OVCC conversion system, including tune-up specifications and discussion of any special tools or techniques required for proper installation, maintenance, or operation.
 - (iv) An 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 applicant's facility, if requested by the Executive Officer.
 - (v) Names and addresses of the fabrication, assembly line, and test facilities where the OVCC conversion system is manufactured and tested.

5. TEST PROCEDURES FOR OVCC CONVERSION SYSTEMS

- (a) Description of Applicable Vehicles:
These procedures are applicable to OVCC conversion systems for 2000 and subsequent model year hybrid electric vehicles in the passenger car, light-duty truck, and medium-duty vehicle classes.
- (b) Test Procedures for OVCC Converted Vehicles:
The test procedures set forth in the "California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes" and "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles" apply to the certification of OVCC conversion systems, with the following exceptions:

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- (i) The applicable emission standards shall be the same emission standards to which the test group for which the OVCC conversion system is designed. A maximum of one emission data vehicle per test group for which certification is sought shall be required. A bench-test vehicle may be substituted for a durability vehicle and may also be considered an emission-data vehicle. Prior to the commencement of testing, the choice of durability 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.
- (ii) For the purpose of applying the provisions of the “California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes” and “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles” to certification testing of OVCC conversion systems, test vehicles equipped with an OVCC conversion system shall be assumed to have zero miles of mileage accumulation at the time that the OVCC conversion system is installed. Mileage may be subsequently accumulated by driving the vehicle on the road, following a typical suburban route, or on a chassis dynamometer using the Automobile Manufacturer’s Association mileage accumulation cycle (40 C.F.R., Part 86, Appendix IV, as adopted January 28, 1977).
- (iii) Vehicle mileage accumulation on a durability vehicle or bench aging of OVCC conversion system components shall be conducted to determine deterioration factors. Prior to the commencement of any emission or bench aging, the applicant’s test plan must be approved by the Executive Officer. Approval of the test plan shall be contingent upon a demonstration by the applicant that bench aging produces deterioration factors at least as great as durability vehicle testing.
- (iv) Bench aging conducted in lieu of vehicle mileage accumulation shall be conducted for a period of time such that the resulting deterioration of the OVCC conversion system is equivalent to that which would occur during durability vehicle mileage accumulation over a mileage equal to the useful life of the vehicle.
- (v) Vehicle mileage accumulation on a durability vehicle shall be performed in conjunction with emission testing. Before beginning vehicle mileage accumulation of the OVCC conversion system, the system shall be installed on the durability vehicle, the vehicle shall be driven 4,000 +/- 100 miles, and the vehicle shall then be tested for emissions. At the conclusion of vehicle mileage accumulation, a second set of emission tests shall be performed.

Alternatively, if bench aging is used to determine deterioration factors, then bench aging shall be performed in conjunction with emission testing on a bench test vehicle. Before beginning bench aging of the OVCC conversion system, the system shall be installed on the bench test vehicle,

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the vehicle shall be driven for 4,000 +/- 100 miles, and the vehicle shall then be tested for emissions. After the emission tests are completed, the OVCC conversion system shall be removed from the vehicle and subjected to bench aging. At the conclusion of bench aging, the OVCC conversion system shall be reinstalled on the bench test vehicle, and a second set of emission tests shall be performed.

- (vi) Choices of vehicle models, engines, and transmissions for use in emission data vehicles shall be approved by the Executive Officer as being representative of the test groups for which certification is sought, prior to the commencement of testing. Following installation of the OVCC conversion system, the emission data vehicle shall be driven 4,000 +/- 100 miles to stabilize emission rates. After the specified mileage has been accumulated, the emission-data vehicle shall be tested for exhaust and evaporative emissions, as applicable, using the appropriate procedures as set forth in "California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes" and "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles."
- (vii) The deteriorated emissions of emission data vehicles shall be calculated using the deterioration factors found during vehicle mileage accumulation or bench testing. The durability vehicle, bench test vehicle, and all emission data vehicles shall meet the applicable new vehicle useful life emission standards, as well as all applicable emission standards for intermediate mileage levels, for the vehicle's model year.

6. APPROVAL

- (a) Issuance of Executive Orders:
If, after reviewing the test data and other information submitted by the OVCC conversion system manufacturer, the Executive Officer determines that the OVCC conversion system meets the applicable emission standards for the criteria of an approved test plan, as applicable, an Executive Order shall be issued certifying the OVCC conversion system for sale and installation on vehicles in the test groups specified in the application.
- (b) Carry-Over and Carry-Across
 - (i) Carry-over of emission test data from the previous model year to the following model year will be allowed, if the Executive Officer determines that the carry-over data will adequately represent the emissions performance of the OVCC conversion system to be certified. Carry-across to similar test groups will also be allowed.
 - (ii) Applications for carry-over and carry-across must be accompanied by an engineering analysis demonstrating that the emissions and durability of the OVCC conversion system and the test group for which certification is being sought will be adequately represented by a certified conversion system/test group application.

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7. WARRANTY REQUIREMENTS

(a) Requirements of Manufacturers:

Each manufacturer of an OVCC conversion system shall warrant to the person having the vehicle converted and to each subsequent purchaser of the vehicle that the OVCC 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 OVCC 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. For PZEVs, this warranty requirement will be effective for the applicable warranty period specified in Section 1962(c), Title 13, CCR. 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 OVCC conversion system.

(b) Requirements of Installers:

Each installer of an OVCC conversion system shall warrant to the person having the vehicle converted and to each subsequent purchaser of the vehicle that the OVCC 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 OVCC 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 OVCC 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 cost including the cost of diagnosis, labor, and parts, including any part on the converted vehicle that is damaged due to incorrect installation of the OVCC conversion system.

8. IN-USE TESTING REQUIREMENTS

The Air Resources Board may select up to five OVCC conversion system per manufacturer per year for in-use testing. The manufacturer must provide 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)(b). Testing costs will be borne by the Air Resources Board, except for those OVCC conversion systems that do not comply with the applicable emission standards. If one or more of the OVCC conversion

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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 OVCC conversion system to be tested. Additional OVCC conversion system to be tested shall be limited to no more than five from the same Executive Order as the failed OVCC conversion system.

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[This is a new section and therefore does not have any existing language. For ease of reading the text is not underlined.]

13 CCR § 2032

TITLE 13. MOTOR VEHICLES
DIVISION 3. AIR RESOURCES BOARD
CHAPTER 1. MOTOR VEHICLE POLLUTION CONTROL DEVICES
ARTICLE 5. APPROVAL OF SYSTEMS DESIGNED TO CONVERT MOTOR
VEHICLES TO USE FUELS OTHER THAN THE ORIGINAL CERTIFICATION FUEL
OR TO CONVERT MOTOR VEHICLES FOR EMISSION REDUCTION CREDIT OR TO
CONVERT HYBRID ELECTRIC VEHICLES TO OFF-VEHICLE CHARGE CAPABLE
HYBRID ELECTRIC VEHICLES

§ 2032. Off-Vehicle Charge Capable Conversion Systems

(a) Applicable Standards

Hybrid electric vehicles converted to incorporate off-vehicle charging must at a minimum meet the emission standards of the unmodified vehicle's original certification standards.

(b) Test Procedures

To determine the approval of off-vehicle charge capable conversion systems designed to convert 2000 and subsequent model year hybrid electric vehicles, "California Certification and Installation Procedures for Off-Vehicle Charge Capable Conversion Systems for 2000 and Subsequent Model Year Hybrid Electric Vehicles" will be used.