

APPENDIX D

State of California
AIR RESOURCES BOARD

PROPOSED

**CALIFORNIA STANDARDS AND TEST PROCEDURES FOR NEW 2021 AND
SUBSEQUENT MODEL HEAVY-DUTY ZERO-EMISSION POWERTRAINS**

Adopted: [INSERT DATE OF ADOPTION]

NOTE: This document is incorporated by reference in section 1956.8, title 13, California Code of Regulations (CCR). It contains the requirements necessary for criteria pollutant and greenhouse gas certification of a heavy-duty electric or hydrogen fuel-cell powertrain for sale in California. However, reference is made in these test procedures to other California Air Resources Board (CARB) documents that contain certification requirements for heavy-duty electric and fuel-cell vehicles. Note that this list of documents is not inclusive of all necessary requirements to complete an application for certification. The following documents are designed to be used in conjunction with this document. They include:

1. "California Greenhouse Gas Exhaust Emission Standards and Test Procedures for 2014 and Subsequent Model Heavy-Duty Vehicles," as last amended [INSERT ADOPTION DATE] (incorporated by reference in section 95663, title 17, CCR)

NOTE: This document is incorporated by reference in section 1956.8, title 13, California Code of Regulations. This document contains the requirements for certification of a battery-electric or hydrogen fuel-cell powertrain used in heavy-duty and incomplete medium-duty vehicles for sale in California. This document does not apply to zero-emission powertrains used in combustion hybrids.

PART I: Heavy-Duty Zero-Emission Powertrain Certification Requirements

A. General Applicability. All Model Year (MY) 2021 and subsequent MY electric and hydrogen fuel-cell powertrains intended for use in heavy-duty vehicles (over 14,000 pounds gross vehicle weight rating) and incomplete medium-duty vehicles (from 8,501 through 14,000 pounds gross vehicle weight rating) may be certified to these procedures. Other regulations may require such powertrains to certify to the requirements in these test procedures, but otherwise, certification of such powertrains is voluntary.

B. Definitions: For the purpose of these procedures, the following definitions apply:

“Applicant” or “manufacturer” means the person or entity who applies for a certification pursuant to these procedures. The applicant shall be responsible for the requirements set forth in these test procedures.

“Battery Cell” means a system consisting of an anode, a cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy.

“Battery-Electric Vehicle” has the same definition “Electric Vehicle” in Title 40, Code of Federal Regulations (CFR) § 1037.801, last amended by the United States Environmental Protection Agency (U.S. EPA) on June 17, 2013, hereby incorporated by reference herein.

“Battery Management System” means an electronic system used to monitor and/or control charge and discharge voltage, current, temperature, state of charge or other factors within the battery pack and connected components.

“Battery Module” means a group of battery cells grouped together in series or parallel and packaged together. A battery module may, but does not necessarily, include a battery management system or active thermal management.

“Battery Pack” means multiple battery modules packaged together in series and/or parallel with integrated battery management and/or thermal management systems. While multiple battery packs could be installed in a vehicle, a battery pack, by itself, is considered a complete energy storage system.

“Battery State of Health” means the assessment of battery performance and/or condition relative to its original, new condition, as characterized by the manufacturer.

It may be based upon parameters such as maximum power, internal resistance, self-discharge rate, and overall capacity.

“Electric Motor/Generator” means a machine or device that can generate power for or consume power from a battery or energy storage system for the purposes of providing tractive effort and recapturing regenerative-braking power.

“Energy Storage System” or “ESS” means a system that is designed to store the energy on a vehicle, such as the battery pack or hydrogen storage tank.

“Executive Officer” means the Executive Officer of the California Air Resources Board or his or her authorized representative.

“Fuel-Cell Powertrain” means a powertrain designed to propel a vehicle with an electric motor where energy for the motor is supplied by an electrochemical cell that produces electricity via the non-combustion reaction of hydrogen.

“Inverter” means an electronic device that converts either direct to alternating or vice versa.

“Model Code” means a manufacturer-specified code that can be used to identify unique powertrain subfamilies.

“Model Year” or “MY” has the same definition as in title 13, CCR § 1900.

“Powertrain” or “Zero-Emission Powertrain” has the same definition as “zero-emission powertrain” in title 13, CCR § 1956.8.

“Powertrain subfamily” means a powertrain configuration within a certification family that has identical battery modules as other subfamilies within the same certification family. Subfamilies within a certification family may contain different thermal management systems, battery management systems, architectures, and battery pack capacity.

“Rated Capacity Energy” means the amount of electrical energy, in watt-hours (Wh), that can be extracted from a fully charged ESS, based on or derived from the results of testing or analysis. The rated capacity includes the electrical energy of the battery pack that is not accessible due to a manufacturer-programmed decrease in energy capacity for battery pack protection.

“Thermal Management Systems” means any device incorporated into the powertrain designed to control the temperature of a battery pack or other component such as an inverter or fuel-cell stack. This could be active cooling, such as through liquid or gas coolant flow, or passive cooling, such as through natural convection from a component to a heat sink.

“Usable Energy Capacity” means the amount of electrical energy, in watt-hours (Wh), in a fully charged battery pack available to the operator during normal usage of the powertrain in which it is installed. It *does not* include the electrical energy of the battery pack that is not accessible due to a manufacturer-programmed decrease in capacity for battery pack protection. A manufacturer may elect to issue a new rating for the usable energy capacity of a battery (if it has deteriorated) when offering the zero-emission powertrain, or the vehicle in which the powertrain is installed, for sale in a secondary application or market.

C. General Requirements for Powertrain Certification:

1. Certification Families

1.1. Battery-Electric Powertrains

1.1.1 Each substantially similar battery pack, based on cell chemistry, module construction (e.g., cylindrical, prismatic, pouch), the battery management system, and battery thermal management systems (e.g., air cooling, indirect liquid cooling) constitutes a certification family and each family is required to obtain its own Executive Order, except as provided in C.1.3 and C.1.4. This includes batteries designed to directly accept electric power from off-board the vehicle that are integrated into fuel-cell powertrains.

1.1.2 For a powertrain designed to have two or more unique battery types as described in C.1.1.1 within a single powertrain, the manufacturer may apply to have all of battery types included in a single certification family. The powertrain manufacturer shall describe the potential combinations of battery types. Each unique battery type shall be responsible for the requirements set forth in subsection C.2 and section D.

1.2. Fuel-Cell Powertrains. For fuel-cell powertrains, each substantially similar fuel-cell stack type, as defined by the chemistry (e.g., anode layer, cathode layer, electrolyte chemistry) and hardware components of the stack, constitutes a certification family and each family is required to obtain its own Executive Order. In addition, batteries designed to directly accept electric power from off-board the vehicle that are integrated into the fuel-cell powertrain will be treated as independent battery packs and will be subject to the requirements of battery-electric powertrains as well as fuel-cell powertrains. If a battery is used as an energy storage buffer for a fuel-cell powertrain and is not designed to directly accept charge from off-board the vehicle, the battery shall not be considered part of the battery pack.

- 1.3. Energy storage systems with different rated capacities may be grouped together in one Executive Order if they have identical components at a modular level, as well as cell construction, thermal management strategies, and battery management strategies that are functionally equivalent. This may encompass a battery pack with scalable number of battery modules or a powertrain with multiple identical battery packs installed in series or parallel.
- 1.4. A manufacturer may certify multiple configurations of a powertrain with interchangeable components together in one Executive Order as different subfamilies. This may include different battery pack configurations (e.g., different arrangement or orientation of battery modules and battery thermal management hardware within the battery pack) as well as different battery management and thermal management strategies provided that the battery modules are identical. During the certification process, the manufacturer must describe all potential subfamilies as well as provide the information required in subsection C.2 for each individual component.
- 1.5. Manufacturers may add additional or change components to the powertrain configuration mid-MY provided that the components are not part of the battery module, and that the strategies used by battery management and thermal management systems are unchanged. In such cases, the manufacturer will be required to notify the Executive Officer of these changes within 30 days of the completion of the MY in which the changes took place, and the affected subfamilies. Manufacturers will be required to distinguish the powertrain configurations by powertrain serial number or using a combination of build date and a manufacturer-designated model code.

2. System Monitoring and Diagnostics Information.

For each test group, a powertrain manufacturer must provide information (i.e., a description) related to the system monitoring and diagnostics components and software strategies of the zero-emission powertrain. The requirements in this section do not dictate the monitoring or diagnostics systems that manufacturers must implement.

- 2.1. Manufacturers making major changes to the monitoring and diagnostics systems such as changes to the architecture or hardware of the battery pack that are not included in the original certification application will be required to create a new certification family to include such changes.

- 2.2. Manufacturers making minor changes to the monitoring and diagnostics systems that do not change the architecture or hardware of the battery pack will not be required to create a new certification family to include such changes but shall be required to notify the Executive Officer of these changes within 30 days of the completion of the MY in which the changes took place. The manufacturers shall describe the changes, the date each change took place, and the serial numbers or other information that can be used to identify the specific powertrains within the certification family affected by each change, such as the combination of model codes and build dates. Minor change examples include changes in the monitoring of data feeds or sensors, power management strategies, or substituting a component with an identically specified component made from a different manufacturer or with a different part number.
- 2.3. The manufacturer shall provide a list of the system monitoring and diagnostics components of the following powertrain subsystems as well as a description of the function of each, if present:
- 2.3.1 Energy Storage System (ESS) - Individual electronic inputs or outputs for the ESS (e.g., battery temperature sensors, battery voltage sensors, battery cell monitors, pressure sensors)
 - 2.3.2 Thermal Management Systems- Individual electronic inputs or outputs that are monitored for thermal management (e.g., powertrain heating or cooling)
 - 2.3.3 Regenerative Braking System – Individual inputs or outputs for the regenerative braking system (e.g., temperature sensors, voltage sensors)
 - 2.3.4 Charging System – Individual inputs or outputs for the charging system (e.g., temperature sensors, voltage sensors)
 - 2.3.5 Electric Motor/Generator – Individual inputs or outputs for the motor/generator system (e.g., temperature sensors, torque and speed sensors)
 - 2.3.6 Fuel-Cell Stack – Individual inputs or outputs for the fuel-cell stack (e.g., voltage sensors, temperature sensors, pressure sensors)
- 2.4. The manufacturer shall provide the range of outputs in addition to the thresholds at which the monitor of any subsystem will indicate a malfunction. In addition, the manufacturer shall describe the situations (e.g., multiple measurements outside of a specific range) in which the vehicle will be commanded to illuminate the malfunction indicator.
- 2.5. The manufacturer shall provide a description of the manufacturer's method for monitoring and calculating the battery state of health including the parameters monitored (e.g., power capacity, internal

resistance, self-discharge rate, overall capacity) and associated fault triggers. A description of how these data channels are aggregated to assess battery state of health shall be disclosed.

3. Required Diagnostic Communications Tools Compatibility

- 3.1. A manufacturer must have installed a connector meeting the requirements in subsection (h)(2) of title 13, CCR, section 1971.1, On-Board Diagnostic System Requirements--2010 and Subsequent Model-Year Heavy-Duty Engines, with a vehicle controller area network communications protocol that is capable of connection and communication with scan tools that meet the requirements in subsection (h)(3) of title 13, CCR, section 1971.1, unless they have a device permanently installed on the vehicle capable of displaying the information required in section 3.2 without the need for additional diagnostic tools.
- 3.2. *Required Monitoring Parameters.* For battery-electric powertrains, the diagnostic communications specified tools in subsection C.3.1 must be capable of communicating the readings from any voltage and temperature sensors monitoring the battery that are useful for repair or diagnosis, cumulative Wh throughout of the battery pack, the default percentage charge and discharge limits, charge rates (in kilowatts), and the current estimate of the usable energy capacity or remaining vehicle range (in miles). For both battery-electric and fuel-cell powertrains, the tools must be capable of communicating any confirmed fault code that is referenced in the diagnostic and repair manual. The manufacturer may design the communication network such that the accessibility of the monitoring parameters in this subsection is limited to those who have undergone manufacturer authorized service training.
- 3.3. A manufacturer must design their powertrain to be capable of interfacing with a vehicle to communicate the parameters specified in subsection C.3.1 through controller area network communications.

4. Repairability

- 4.1 *Availability of Tools.* A manufacturer must make available all diagnostic repair tools to third-party repair facilities in California, incorporating the same diagnostic, repair and wireless capabilities that such manufacturer makes available to its dealers, at a fair and reasonable price. The manufacturer may require technical training prior to offering tools for sale. Manufacturers shall not be required to

provide unrestricted service information access to owners and third-party repair facilities for diagnostic, service and repair information necessary to reset security-related electronic modules or reprogram the vehicle's central processing unit. For provisions in this section 4, consideration may be given to relevant factors, including, but not limited to, the following when evaluating a fair and reasonable price.

- 4.1.1 The net cost to the manufacturer franchised dealerships or authorized service networks for similar information or parts obtained from manufacturers when accounting for any discounts, rebates, or other incentive programs;
 - 4.1.2 The cost to the manufacturer for preparing and distributing the parts or information, excluding any research and development costs incurred in designing and implementing, upgrading or altering the zero-emission powertrain. Amortized capital costs for the preparation and distribution of the information may be included;
 - 4.1.3 The price charged by other manufacturers for similar parts or information;
 - 4.1.4 The ability of the average aftermarket technician or shop to afford the information;
 - 4.1.5 The means by which the parts or information are distributed;
 - 4.1.6 The extent to which the information or parts are used, which includes the number of users, and frequency, duration, and volume of use; and
 - 4.1.7 Inflation.
- 4.2 *Owner's Manual.* The manufacturer shall include an Owner's Manual at the time of powertrain delivery that meets the following requirements.
- 4.2.1 The owner's manual must be provided as a physical copy, as a digital downloadable file online at the manufacturer's website or in another format approved by the Executive Officer at the time of powertrain certification. If the owner's manual is not finalized at the time of powertrain certification, a draft copy may be provided so long as a final copy is provided before the first sale of a vehicle equipped with such powertrain. The manufacturer must provide to the Executive Officer the owner's manual, or access to the owner's manual, upon request free of charge.
 - 4.2.2 The owner's manual must include instructions for the maintenance and use of the powertrain by the owner.
 - 4.2.3 The owner's manual must describe minimum warranty provisions for the certification family.

- 4.2.4 The owner's manual shall make available to the purchaser a current list or online reference of manufacturer-authorized repair and service facilities capable of servicing, diagnosing, and repairing powertrains certified to these procedures. For physical copies, more-current powertrain repair and service network information may be provided as an attachment.
 - 4.2.5 If mobile repair service is provided by the manufacturer in addition to or in lieu of physical service locations, the manufacturer shall provide a description of the services that can be performed in the field along with anticipated response times.
 - 4.2.6 If a manufacturer provides or offers remote/wireless diagnostic and repair services, the applicability and limitations of this service type shall be clearly described.
- 4.3 *Diagnostic and Repair Manual.* The manufacturer must develop a physical or electronic copy of the diagnostic and repair manual for each powertrain family. If the diagnostic and repair manual is not complete at the time of certification, a draft may be provided. The diagnostic and repair manual must describe how to interpret fault codes, remove and install specific powertrain components, and provide schematics of the electrical, mechanical, and thermal management systems. If the same diagnostic and repair manual is applicable to multiple powertrain configurations, the manufacturer shall indicate to which configuration each diagnostic and repair manual is applicable.
- 4.3.1 The manufacturer must provide to the Executive Officer technical service bulletins and updates to the diagnostic and repair manual upon request free of charge.
 - 4.3.2 The manufacturer must provide dealer-level diagnostic software and access to the Executive Officer upon request free of charge.
 - 4.3.3 The manufacturer must make the diagnostic and repair manual, updates, technical service bulletins, and the diagnostic software available to third party repair facilities in California at a fair and reasonable price. The manufacturer may require technical training for access.
 - 4.3.4 The diagnostic and repair manual must be included in the application for certification or online access to it must be provided to the Executive Officer upon request free of charge.
- 4.4 *Required Technical Training.* Any technical training required of a third-party repair facility for access to repair tools and diagnostic and repair manuals must be offered at a fair and reasonable price.

D. Certification Testing for New Battery Packs

Manufacturers of battery-electric powertrains must complete a rated capacity test, for each battery type, per the "Static Capacity Test (Constant Current Method)" set forth in Society of Automotive Engineers (SAE) J1798, "Recommended Practice for Performance Rating of Electric Vehicle Battery Modules," last revised on July 8, 2008, which is hereby incorporated by reference in title 17, CCR, section 95663, with modifications as follows or a substantially similar alternative test procedure to determine rated capacity if approved by the Executive Officer. Should a manufacturer use an alternative test procedure, they must provide engineering analysis to show that the test will accurately measure the rated capacity:

1. The manufacturer shall provide attestation that the test conditions conform to the requirements in section 5.2 to 5.9 of SAE J1798.
2. The manufacturer shall perform the steps described in 6.1.2.1 to 6.1.2.6 of the "Static Capacity Test (Constant Current Method)" as described in SAE J1798 of either the battery module or battery pack. The battery modules or packs tested shall be representative of those manufactured and delivered to the market.
3. The default rate for the test shall be " $C_3/3$," the constant current required to discharge modules in 3 hours as recommended by the battery manufacturer per SAE J1798.
4. The test for battery modules or battery packs shall be run within the design parameters for charge depth, discharge depth, voltage, charge rates, and discharge rates of the battery pack to determine rated capacity. Design parameters must be included in the certification application.
5. During module or pack testing, should the battery temperature increase beyond the recommended limits for safe performance by the manufacturer, cooling strategies may be used as long as they are representative of the cooling strategies and hardware of the batteries manufactured and delivered to market.
6. Should the test be deemed unsafe to run at the recommended limit of " $C_3/3$ " and with the cooling strategies implemented in D.5 of this subsection, the manufacturer may run the test at the limit of the battery manufacturer's recommended discharge rate.
7. If the test is run at the module level, engineering analysis must be used to determine pack-level rated capacity.
8. The test parameters (e.g., module conditioning, sampling frequency, discharge rate, testing battery temperature profile, manufacturer-specified battery charge and discharge limits, number of test samples) and measured rated capacity as measured in the test must be included in the certification application.

9. The usable capacity must be provided for each pack configuration. If only module-level testing was performed, engineering analysis may be used to determine the values for each individual pack configuration.
10. If an alternative test procedure is used, it must be clearly described in the certification application.

E. LABELING

- 1.1. Label Location: The label must be located either next to the powertrain's emergency disconnect or charge port, the vehicle's driver side door jamb, or another readily accessible location not likely to be replaced during the life of the powertrain. The label is not required to be placed in the same location for each powertrain in a certification family. All allowable label locations must be described in the certification application.
- 1.2. Label Information: The label must identify the powertrain family name, the build date, manufacturer name, a serial number or other information, such as manufacturer-specified model code, that can be used to identify the specific powertrains affected by changes allowed in subsection C.2.2, and a compliance statement, "This powertrain conforms to the California Zero-Emission Powertrain Certification Standards for model year [insert model year]."
- 1.3. The label must be permanently affixed, engraved, or stamped in a legible way.

F. CERTIFICATION PROCEDURAL REQUIREMENTS

Application Package: For each certification family, a powertrain manufacturer is required, at a minimum, to submit to the Executive Officer an application package, which includes the following:

1. Letter of Intent: A manufacturer must include in its application package a letter requesting powertrain certification.
2. Powertrain Configuration List. Provide the list of powertrain models and the different configurations. For each powertrain model, provide the following:
 - 2.1 Powertrain model number
 - 2.2 System Monitoring and Diagnostics Information as specified in section C.2

- 2.3 Intended weight class(es) and application (e.g., pickup truck, van, vocational vehicle, tractor, bus)
- 2.4 A manufacturer shall provide specifications for the gear box(s), transmission(s), and transaxle(s) as appropriate.
- 2.5 A manufacturer shall indicate the type, number, mounting location, along with the peak and continuous power ratings, in units of kilowatts, of the electric motor(s) that will provide tractive effort.
- 2.6 Description of inverter(s) including technical specifications, make, and model (as applicable)
- 2.7 Description of motor controller(s), including technical specifications, make, and model (as applicable)
- 2.8 Fuel tank volume, maximum mass capacity of fuel, and pressure capacity (for fuel cell powertrains)

3. Powertrain

- 3.1 Powertrain test group configurations and the manufacturer-designated model codes associated with each configuration
- 3.2 Battery model name (as applicable), technical specifications, and battery chemistry

4. Certification Test Data (for battery-electric powertrains)

- 4.1 Alternative Test Procedure as allowed in section D (if applicable)
- 4.2 Usable Energy Capacity
- 4.3 Rated Energy Capacity
- 4.4 Test Parameters

5. Projected Sales. For the model year certification family for which the certification is sought, a manufacturer shall report:

- 5.1 Projected sales in the United States; and
- 5.2 Projected sales in California.

6. Sample of Powertrain Label

7. Battery end-of-life plan

8. Diagnostic and Repair Manual and Diagnostic Software

PART II: Heavy-Duty Zero-Emission Powertrain Warranty and Recall Requirements

A. Purpose, Applicability, and Definitions.

1. The purpose of this part is to interpret and make specific the statutory warranty set forth in Health and Safety Code sections 43205, and 43205.5 by clarifying the rights and responsibilities of individual zero-emission powertrain owners, zero-emission powertrain manufacturers, and the service industry.
2. This part shall apply to 2021 and subsequent model heavy-duty zero-emission powertrains certified to these test procedures and registered in California, regardless of their original point of registration, installed in vehicles that are certified to the “Enhanced Electric and Fuel-Cell Vehicle Certification Procedures” in the “California Greenhouse Gas Exhaust Emission Standards and Test Procedures for 2014 and Subsequent Model Heavy-Duty Vehicles,” as amended [INSERT AMENDMENT DATE], which is incorporated by reference in section 95663, title 17, CCR.
3. For the purposes of this Part II, the following definitions shall apply:
 - 3.1. “Authorized Service Establishment” means a repair facility that has been authorized by a manufacturer to perform repairs on a particular zero-emission powertrain. A manufacturer may require that a repair facility undergo training and certification to ensure that the repair facility is able to perform powertrain repairs safely and correctly.
 - 3.2. “Days”, when computing any period of time, means normal working days on which a manufacturer is open for business, unless otherwise noted.
 - 3.3. “Executive Officer” means the Executive Officer of the California Air Resources Board or his or her authorized representative.
 - 3.4. “Influenced Recall” means an inspection, repair, adjustment, or modification program initiated and conducted by a manufacturer or its agent or representative as a result of evidence of noncompliance provided or required by the Board, to remedy any nonconformity for which direct notification of powertrain owners is necessary.
 - 3.5. “Nonconformity” or “noncompliance” exists whenever: a substantial number of a class or category of zero-emission powertrains, although properly maintained and used, experience a failure.
 - 3.6. “Ordered Recall” means an inspection, repair, adjustment, or modification program required by the Board and conducted by the manufacturer or its agent or representative to remedy any nonconformity for which direct notification of zero-emission powertrain owners is necessary.
 - 3.7. “Powertrain Manufacturer” means the manufacturer granted certification for a zero-emission powertrain.
 - 3.8. “Quarterly reports” refer to the following calendar periods: January 1-March 31, April 1-June 30, July 1-September 30, October 1-December 31.

- 3.9. "Ultimate purchaser" has the same meaning as defined in section 39055.5 of the Health and Safety Code.
 - 3.10. "Vehicle integration component" has the same definition as in "California Greenhouse Gas Exhaust Emission Standards and Test Procedures for 2014 and Subsequent Model Heavy-Duty Vehicles," as amended [INSERT AMENDMENT DATE], which is incorporated by reference in section 95663, title 17, CCR..
 - 3.11. "Voluntary Recall" means an inspection, repair, adjustment, or modification program voluntarily initiated and conducted by a manufacturer or its agent or representative to remedy any nonconformity for which direct notification of vehicle owners is necessary.
 - 3.12. "Warrantable Condition" means a condition of failure of a warranted part that renders the vehicle inoperable and triggers the responsibility of the manufacturer to take corrective action pursuant to subsections B, C, and D of this part.
 - 3.13. "Warranted Part" means, in the case of zero-emission powertrains, any powertrain component.
 - 3.14. "Warranty Period" means the period of time and mileage that the zero-emission powertrain is covered by the warranty provisions.
 - 3.15. "Warranty Station" means a service facility authorized by the zero-emission powertrain manufacturer to perform warranty repairs. This shall include all of the manufacturer's dealerships that are franchised to service the subject vehicles or powertrains.
- B. The warranty period shall begin on the date the vehicle is delivered to an ultimate purchaser, or if the vehicle is first placed in service as a "demonstrator" or "company" car prior to delivery, on the date it is first placed in service.

1. General Warranty Coverage

The manufacturer of each zero-emission powertrain shall warrant to the ultimate purchaser and each subsequent purchaser that the zero-emission powertrain is:

- 1.1. Designed, built, and equipped so as to conform, at the time of sale, with all applicable regulations adopted by the California Air Resources Board pursuant to its authority in chapters 1 and 2, part 5, division 26 of the Health and Safety Code;
- 1.2. Free from defects in materials and workmanship that could cause the failure of a warranted part; and
- 1.3. Is identical in all material respects to zero-emission powertrain as described in the zero-emission powertrain manufacturer's application for certification.

2. Warranty Period

The warranty period applicable shall be for a period of use of three years or 50,000 miles, whichever occurs first, for zero-emission powertrain components.

3. Subject to the conditions and exclusions of subsection B.7, the warranty on warranted parts shall function as follows:
 - 3.1. Any warranted part that is not scheduled for replacement as required maintenance in the written instructions required by subsection B.4 shall be warranted for the warranty period defined in subsection B.2. If any such part fails during the warranty period, it shall be repaired or replaced by the zero-emission powertrain manufacturer according to subsection B.3.4 below. Any such part repaired or replaced under warranty shall be warranted for the remaining warranty period.
 - 3.2. Any warranted part that is scheduled only for regular inspection in the written instructions required by subsection B.4 shall be warranted for the warranty period defined in subsection B.2. A statement in such written instructions to the effect of "repair or replace as necessary" shall not reduce the period of warranty coverage. Any such part repaired or replaced under warranty shall be warranted for the remaining warranty period.
 - 3.3. Any warranted part that is scheduled for replacement as required maintenance in the written instructions required by subsection B.4 shall be warranted for the period of time or mileage, whichever first occurs, prior to the first scheduled replacement point for that part. If the part fails before the first scheduled replacement point, the part shall be repaired or replaced by the powertrain manufacturer according to subsection B.3.4 below. Any such part repaired or replaced under warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for the part.
 - 3.4. Repair or replacement of any warranted part under the warranty provisions of this article shall be performed at no charge to the powertrain owner, at an authorized service establishment. The manufacturer shall reimburse the owner for his or her expenses including diagnostic charges for such repair or replacement, not to exceed the manufacturer's suggested retail price for all warranted parts replaced and labor charges based on the manufacturer's recommended time allowance for the warranty repair and the geographically appropriate hourly labor rate. Zero-emission powertrain manufacturers shall establish reasonable emergency repair procedures. A zero-emission powertrain owner may reasonably be required to keep receipts and failed parts in order to receive compensation for warranted repairs reimbursable due to an emergency, provided the manufacturer's written instructions advise the owner of his obligation.
 - 3.5. Notwithstanding the provisions of subsection B.3.4, warranty services or repairs shall be provided at all of a manufacturer's dealership that are franchised to service the subject zero-emission powertrains.

- 3.6. The zero-emission powertrain owner shall not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at a warranty station.
- 3.7. The zero-emission powertrain manufacturer shall be liable for damages to other vehicle components proximately caused by a failure under warranty of any warranted part.
- 3.8. Throughout the zero-emission powertrain warranty period defined in subsection B.2, the zero-emission powertrain manufacturer shall maintain a supply of warranted parts sufficient to meet the expected demand for such parts. The lack of availability of such parts or the incompleteness of repairs within a reasonable time period, not to exceed 30 days from the time the vehicle or powertrain is initially presented to the warranty station for repair, shall constitute an emergency for purposes of subsection B.3.4.
- 3.9. Any replacement part designated by a manufacturer may be used in warranty repairs and shall be provided without charge to the powertrain owner. Such use shall not reduce the warranty obligations of the powertrain manufacturer, except that the powertrain manufacturer shall not be liable under this part for repair or replacement of any replacement part that is not a warranted part (except as provided under subsection B.3.7).
- 3.10. Any add-on or modified part exempted by the Executive Officer from the prohibitions of Vehicle Code section 27156 may be used on a zero-emission powertrain. Such use, in and of itself, shall not be grounds for disallowing a warranty claim made in accordance with this article. The zero-emission powertrain manufacturer shall not be liable under this article to warrant failures of warranted parts caused by the use of an add-on or modified part.
- 3.11. The Executive Officer may request and, in such case, the zero-emission powertrain manufacturer shall provide, any documents that describe that manufacturer's warranty procedures or policies.
4. Each manufacturer shall furnish with each new zero-emission powertrain written instructions for the maintenance and use of the zero-emission powertrain by the owner.
5. Each manufacturer shall furnish with each new zero-emission powertrain a list of the warranted parts installed on that zero-emission powertrain.
6. Each manufacturer shall submit the documents required by subsections B.4 and B.5 with the manufacturer's preliminary application for new zero-emission powertrain certification for approval by the Executive Officer. The Executive Officer may reject or require modification of the manufacturer's list of warranted parts to ensure that each such list is of proper scope and also may reject or require modification of any of the documents required by subsection B.4.

Approval by the Executive Officer of the documents required by subsections B.4 and B.5 shall be a condition of certification. The Executive Officer shall approve or disapprove the documents required by subsections B.4 and B.5 within 60 days of the date such documents are received from the manufacturer. Any disapproval shall be accompanied by a statement of the reasons therefore. In the event of disapproval, the manufacturer may petition the Board to review the decision of the Executive Officer.

7. Exclusions

- 7.1. The repair or replacement of any warranted part otherwise eligible for warranty coverage under subsection B.3, shall be excluded for such warranty coverage if the vehicle or powertrain manufacturer demonstrates that the vehicle or powertrain 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.
- 7.2. Except as provided in subsection B.7.1 above, any adjustment of a factory-installed, and properly operating, adjustment limiting device (such as speed limiter) is eligible for warranty coverage under subsection B.3.

C. Zero-Emission Powertrain Owner Obligations

1. The owner of any zero-emission powertrain warranted pursuant to this part shall be responsible for the performance of all required scheduled maintenance specified in the written instructions furnished to the owner pursuant to subsections B.4. Such maintenance may be performed by the owner or at authorized service establishments.
2. Except as specified in subsections B.7.1, failure of the zero-emission powertrain owner to ensure the performance of such scheduled maintenance or to keep maintenance records shall not, per se, be grounds for disallowing a warranty claim.

D. Mediation; Finding of Warrantable Condition

1. This section is intended to provide a mechanism for mediating warranty disputes between zero-emission powertrain owners and manufacturers or their agents.
2. A zero-emission powertrain owner may request that the Executive Officer mediate a warranty claim.
 - 2.1. Upon receipt of such a claim, the Executive Officer may make a determination regarding whether the claim is meritorious on its face and, if meritorious, shall notify the appropriate dealer or zero-emission powertrain manufacturer of the claim. The party against whom a complaint is made shall be given a reasonable time in which to respond.

The Executive Officer may conduct an informal conference, and may request additional information and evidence.

- 2.2. Upon examination of the facts submitted by the parties concerned, the Executive Officer may find that a warranted part, or a zero-emission powertrain's nonconformity with any California statutorily authorized maintenance program, is eligible for warranty coverage pursuant to this part. If such a finding is made, the Executive Officer shall issue a Finding of Warrantable Condition.
- 2.3. The Finding of Warrantable Condition shall include the name of the zero-emission powertrain owner, zero-emission powertrain manufacturer, model code, build date, zero-emission powertrain serial number (if applicable), zero-emission powertrain family name, vehicle odometer reading, date of inspection, identification of the defective part or other warrantable condition and the signature of the person issuing the Finding.

E. Severability

Each subsection of this part shall be deemed severable, and in the event that any part of these procedures is held to be invalid, the remainder of these procedures shall continue in full force and effect.

F. Initiation and Approval of Voluntary and Influenced Recalls

1. When any manufacturer initiates a voluntary recall campaign, the manufacturer shall notify the Executive Officer of the recall at least 30 days before owner notification is to begin. The manufacturer shall also submit a voluntary recall plan for approval, as prescribed under section G of this part. A voluntary recall plan shall be deemed approved unless disapproved by the Executive Officer within 20 days after receipt of the recall plan.
2. When any manufacturer, based on enforcement action or any other information provided or required by the Executive Officer, proposes to initiate an influenced recall campaign, the manufacturer shall submit for approval by the Executive Officer an influenced recall plan as prescribed by section G of these procedures. The plan shall be submitted within 45 days following the receipt of a notification from the Executive Officer that enforcement action or other information demonstrate zero-emission powertrain noncompliance.
3. The Executive Officer shall approve the recall plan if the plan contains the information specified in section G and is designed to notify the zero-emission powertrain owner and correct the nonconformity in an expeditious manner. Notification of vehicle or powertrain owners and the implementation of recall repairs shall commence no later than the schedule determined by the manufacturer as required in sections G.3 and G.4, unless the manufacturer can show good cause for the Executive Officer to extend the deadline.

G. Voluntary and Influenced Recall Plans

The recall plan for both voluntary and influenced recalls shall contain the following information unless otherwise specified:

1. A description of each class or category of zero-emission powertrains subject to recall including the number of zero-emission powertrains subject to recall, the applicable powertrain certification families, certification family or a subgroup thereof, the model year, the model code, build dates, and such other information as may be required to identify the zero-emission powertrains to be recalled.
2. A description of the nonconformity and the specific modifications, alterations, repairs, adjustments, or other changes to be made to correct the powertrains or vehicles (if applicable).
3. A description of the method by which the manufacturer will determine the names and addresses of zero-emission powertrain owners and the manufacturer's method and schedule for notifying the service facilities and zero-emission powertrain owners of the recall.
4. A description of the procedure that zero-emission powertrain owners may follow to obtain correction of the nonconformity. This shall include the date on or after which the owner can have the nonconformity remedied, the time reasonably necessary to perform the labor to remedy the nonconformity, and the designation of facilities at which the nonconformity can be remedied.
5. If some or all of the nonconforming zero-emission powertrains are to be remedied by persons other than dealers or authorized warranty agents of the manufacturer, a description of such class of persons.
6. A copy of the letter of notification to be sent to zero-emission powertrain owners.
7. A description of the system by which the manufacturer will assure that an adequate supply of parts will be available to perform the repair under the recall plan, including the date by which an adequate supply of parts will be available to initiate the repair campaign, and the method to be used to assure the supply remains both adequate and responsive to owner demand.
8. A copy of all necessary instructions to be sent to those persons who are to perform the repair.
9. A description of the impact of the proposed repairs or adjustments on range, performance, durability and safety of each class or category of vehicles or powertrains to be recalled and a brief summary of the data, technical studies, or engineering evaluations which support these descriptions.

H. Repair Label and Proof of Correction Certificate for Voluntary and Influenced Recall Plans

1. The manufacturer shall require those who perform the repair to affix a label to each zero-emission powertrain repaired, or, when required, inspected, under the voluntary or influenced recall plan.
2. The label shall be placed in a location approved by the Executive Officer and shall be fabricated of a material suitable for such location in which it is installed and which is not readily removable.
3. The label shall contain the recall campaign number and a code designating the campaign facility at which the repair, or inspection for repair, was performed.
4. The manufacturer shall require those who perform the repair to provide the owner for each zero-emission powertrain repaired with a certificate, in a format prescribed by the Executive Officer, which indicates that the noncomplying zero-emission powertrain has been corrected under the recall program.

I. Notification

The notification of vehicle or powertrain owners shall contain the following:

1. A statement that the nonconformity of any such zero-emission powertrain will be remedied at the expense of the manufacturer.
2. A statement describing the adverse effect, if any, of the uncorrected nonconformity on the range, performance, durability, or safety of the zero-emission powertrain.
3. A statement that a certificate showing that the zero-emission powertrain has been repaired under the recall program shall be issued by the service facilities.
4. A card to be used by a zero-emission powertrain owner in the event the zero-emission powertrain to be recalled has been sold. Such card should be addressed to the manufacturer, have postage paid, and shall provide a space in which the owner may indicate the name and address of the person to whom the zero-emission powertrain was sold or transferred.
5. The statement: "In order to ensure your full protection under the warranty provisions, it is recommended that you have your zero-emission powertrain serviced as soon as possible. Failure to do so could be determined as lack of proper maintenance of your zero-emission powertrain."
6. A telephone number provided by the manufacturer, which may be used

to report difficulty in obtaining recall repairs.

J. Recordkeeping and Reporting Requirements

1. Unless otherwise specified by the Executive Officer, the manufacturer shall report on the progress of the 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, Emission Compliance, Automotive Regulations and Science Division, 9528 Telstar, El Monte, California 91731. For each class or category of zero-emission powertrains subject to the recall campaign, the quarterly report shall contain the following:
 - 1.1 Zero-emission powertrain certification family, model code, build date and recall campaign number designated by the manufacturer.
 - 1.2 Date owner notification was begun, and date completed.
 - 1.3 Number of zero-emission powertrains involved in the voluntary or influenced recall campaign.
 - 1.4 Number of zero-emission powertrains known or estimated to be affected by the nonconformity and an explanation of the means by which this number was determined.
 - 1.5 Number of zero-emission powertrains inspected pursuant to the voluntary or influenced recall plan.
 - 1.6 Number of zero-emission powertrains found to be affected by the nonconformity.
 - 1.7 Number of zero-emission powertrains identified for repair under the recall plan.
 - 1.8 Number of zero-emission powertrains determined to be unavailable for inspection or repair under the recall plan due to exportation, theft, scrapping, or for other reasons (specify).
 - 1.9 Number of zero-emission powertrains determined to be ineligible for recall action due to removed or altered components.
 - 1.10 A listing of the vehicle identification numbers of the vehicles equipped with the zero-emission powertrains subject to recall but for whose repair the manufacturer has not been invoiced. This listing shall be supplied in a standardized computer data storage device to be specified by the Executive Officer. The frequency of this submittal may be changed by the Executive Officer depending on the needs of recall enforcement
 - 1.11 A copy of any service bulletins transmitted to dealers or other authorized repair facilities that relate to the nonconformity to be corrected and that have not previously been reported.
 - 1.12 A copy of all communications transmitted to zero-emission powertrain owners that relate to the nonconformity and that have not previously been submitted.

2. If the manufacturer determines that any of the information submitted to the Executive Officer pursuant to section J.1 above has changed or was incorrect, revised information and an explanatory note shall be submitted. Responses to subsections J.1.5, J.1.6, J.1.7, J.1.8, and J.1.9 above shall be cumulative totals.
3. The manufacturer shall maintain in a form suitable for inspection, such as computer information storage devices or card files, and shall make available to the Executive Officer the names and addresses of zero-emission powertrain owners:
 - 3.1 To whom notification was given;
 - 3.2 Whose zero-emission powertrains were repaired or inspected under the recall plan; and
 - 3.3 Who were determined not to qualify for such recall action due to removed or altered components.
4. The information gathered by the manufacturer to compile the reports required by these procedures shall be retained for not less than one year beyond the warranty period of the zero-emission powertrains and shall be made available to the Executive Officer upon request.

K. Penalties

Under the influenced recall, failure by a manufacturer to notify the zero-emission powertrain owners and repair the zero-emission powertrain in the manner specified in the plan shall constitute a violation of the Executive Officer's order approving the plan and a violation of Health and Safety Code Section 43105.

L. Initiation and Notification of Ordered Recalls.

1. A manufacturer shall be notified whenever the Executive Officer has determined, based on warranty information reports, field information reports, enforcement action, or any other information, that the number of warranted parts of a class or category of zero-emission powertrains produced by that manufacturer, despite having been properly maintained and used, have experienced confirmed failures at a level that exceeds the failure level thresholds set forth in section X.
2. The notification shall include a description of each class or category of zero-emission powertrain encompassed by the determination of nonconformity, shall set forth the factual basis for the determination and shall designate a date at least 45 days from the date of receipt of such notification by which the manufacturer shall submit a plan to remedy the nonconformity.

M. Availability of Public Hearing.

1. The manufacturer may request a public hearing pursuant to the procedures set forth in sections 60055.1 to 60055.43, title 17, of the CCR to contest the finding of nonconformity and the necessity for or the scope of any ordered corrective action.
2. If a manufacturer requests a public hearing pursuant to subsection M.1 above, and if the Executive Officer's determination of nonconformity is confirmed at the hearing, the manufacturer shall submit the recall plan in accordance with section N within 30 days after receipt of the Board's decision.

N. Ordered Recall Plan.

1. Unless a public hearing is requested by the manufacturer, a recall plan shall be submitted to the Chief, Emissions Compliance, Automotive Regulations and Science Division, 9528 Telstar Avenue, El Monte, California 91731, within the time limit specified in the notification. The Executive Officer may grant the manufacturer an extension upon good cause shown.
2. The recall plan shall contain the following:
 - 2.1 A description of each class or category of zero-emission powertrains to be recalled, including the zero-emission powertrains family or sub-group thereof, the model-year, the model code, build date, and such other information as may be required to identify the zero-emission powertrains to be recalled.
 - 2.2 A description of the nonconformity and the specific modifications, alterations, repairs, corrections, adjustments or other changes to be made to bring the zero-emission powertrains into conformity including a brief summary of the data and technical studies that support the manufacturer's decision regarding the specific corrections to be made.
 - 2.3 A description of the method by which the manufacturer will determine the names and addresses of zero-emission powertrains owners and the method by which they will be notified.
 - 2.4 A description of the procedure that zero-emission powertrains owners may follow to obtain correction of the nonconformity including the date on or after which the owner can have the nonconformity remedied, the time reasonably necessary to perform the labor required to correct the nonconformity, and the designation of facilities at which the nonconformity can be remedied. The repair shall be completed within a reasonable time, as designated by the Executive Officer, from the date the owner delivers the zero-emission

powertrains for repair. This requirement becomes applicable on the date designated by the manufacturer as the date on or after which the owner can have the nonconformity remedied.

- 2.5 If some or all of the nonconforming zero-emission powertrains are to be remedied by persons other than dealers or authorized warranty agents of the manufacturer, a description of such class of persons and a statement indicating that the participating members of the class will be properly equipped to perform such remedial action.
- 2.6 A copy of the letter of notification to be sent to zero-emission powertrain owners.
- 2.7 A description of the system by which the manufacturer will assure that an adequate supply of parts will be available to perform the repair under the recall plan including the date by which an adequate supply of parts will be available to initiate the repair campaign, and the method to be used to assure the supply remains both adequate and responsive to owner demand.
- 2.8 A description of the impact of the proposed changes on range, performance, durability, and safety of each class or category of vehicles or powertrains to be recalled and a brief summary of the data, technical studies, or engineering evaluations which support these descriptions.
- 2.9 Any other information, reports, or data that the Executive Officer may reasonably determine to be necessary to evaluate the recall plan.

O. Approval and Implementation of Recall Plan.

1. If the Executive Officer finds that the recall plan is designed effectively to correct the nonconformity and complies with the provisions of section N, he or she will so notify the manufacturer in writing. Upon receipt of the approval notice from the Executive Officer, the manufacturer shall commence implementation of the approved plan. Notification of zero-emission powertrain owners and the implementation of recall repairs shall commence within 45 days of the receipt of notice unless the manufacturer can show good cause for the Executive Officer to extend the deadline.
2. If the Executive Officer does not approve the recall plan as submitted, the Executive Officer shall order modification of the plan or mitigation measures with such changes and additions as he or she determines to be necessary. The Executive Officer shall notify the manufacturer in writing of the disapproval and the reasons for the disapproval.

P. Notification of Owners.

1. Notification to zero-emission powertrain owners shall be made by first class mail or by such other means as approved by the Executive Officer such that

for good cause, the Executive Officer may require the use of certified mail to ensure an effective notification.

2. The manufacturer shall use all reasonable means necessary to locate zero-emission powertrain owners such that, for good cause, the Executive Officer may require the manufacturer to use motor vehicle registration lists available from State or commercial sources to obtain the names and addresses of vehicle or powertrain owners to ensure effective notification.
3. The Executive Officer may require subsequent notification by the manufacturer to vehicle or powertrain owners by first class mail or other reasonable means such that, for good cause, the Executive Officer may require the use of certified mail to ensure effective notification.
4. The notification of zero-emission powertrain owners shall contain the following:
 - 4.1 A statement that the nonconformity of any such zero-emission powertrains will be remedied at the expense of the manufacturer.
 - 4.2 A statement that eligibility may not be denied solely on the basis that the zero-emission powertrain owner used parts not manufactured by the original equipment zero-emission powertrain manufacturer.
 - 4.3 A clear description of the components that will be affected by the recall action and a general statement of the measures to be taken to correct the nonconformity.
 - 4.4 A statement describing the adverse effect, if any, of the uncorrected nonconformity on the range, performance, durability, or safety of the zero-emission powertrain.
 - 4.5 A description of the procedure that the zero-emission powertrain owner may follow to obtain correction of the nonconformity including the date on or after which the owner can have the nonconformity remedied, the time reasonably necessary to correct the nonconformity, and a designation of the facilities at which the nonconformity can be remedied.
 - 4.6 A statement that a certificate showing that the zero-emission powertrain has been repaired under the recall program shall be issued by the service facilities.
 - 4.7 A card to be used by a zero-emission powertrain owner in the event the zero-emission powertrain to be recalled has been sold. Such card should be addressed to the manufacturer, have postage paid, and shall provide a space in which the owner may indicate the name and address of the person to whom the zero-emission powertrain was sold or transferred.
 - 4.8 The statement: "In order to ensure your full protection under the warranty provisions, it is recommended that you have your zero-

emission powertrain serviced as soon as possible. Failure to do so could be determined as lack of proper maintenance of your zero-emission powertrain.”

- 4.9 A telephone number provided by the manufacturer, which may be used to report difficulty in obtaining recall repairs.

Q. Repair Label and Proof of Correction Certificate for Ordered Recall Plans.

1. The manufacturer shall require those who perform the repair to affix a label to each vehicle or powertrain repaired, or, when required, inspected, under the voluntary or influenced recall plan.
2. The label shall be placed in a location approved by the Executive Officer and shall be fabricated of a material suitable for such location in which it is installed and that is not readily removable.
3. The label shall contain the recall campaign number and a code designating the campaign facility at which the repair, or inspection for repair, was performed.
4. The manufacturer shall require those who perform the repair to provide the owner for each zero-emission powertrain repaired with a certificate, in a format prescribed by the Executive Officer, which indicates that the noncomplying zero-emission powertrain has been corrected under the recall program.

R. Preliminary Tests

The Executive Officer may require the manufacturer to conduct tests on zero-emission powertrains incorporating a proposed correction, repair, or modification reasonably designed and necessary to demonstrate the effectiveness of the correction, repair, or modification.

S. Communication with Repair Personnel

The manufacturer shall provide to the Executive Officer a copy of all communications that relate to the recall plan directed to dealers and other persons who are to perform the repair. Such copies shall be mailed to the Executive Officer contemporaneously with their transmission to dealers and other persons who are to perform the repair under the recall plan.

T. Recordkeeping and Reporting Requirements for Ordered Recalls

1. Unless otherwise specified by the Executive Officer, the manufacturer shall report on the progress of the 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, Emission Compliance, Automotive Regulations and Science Division, 9528 Telstar Avenue, El Monte, California 91731. For each class or category of zero-emission powertrain subject to the recall campaign, the quarterly report shall contain the following:

- 1.1 Zero-emission powertrain certification family, model code, build-dates and recall campaign number designated by the manufacturer.
 - 1.2 Date owner notification began, and date completed.
 - 1.3 Number of zero-emission powertrains involved in the ordered recall campaign.
 - 1.4 Number of zero-emission powertrains known or estimated to be affected by the nonconformity and an explanation of the means by which this number was determined.
 - 1.5 Number of zero-emission powertrains inspected pursuant to the ordered recall plan.
 - 1.6 Number of zero-emission powertrains found to be affected by the nonconformity.
 - 1.7 Number of zero-emission powertrains identified for repair under the recall plan.
 - 1.8 Number of zero-emission powertrains determined to be unavailable for inspection or repair under the recall plan due to exportation, theft, scrapping, or for other reasons (specify).
 - 1.9 Number of zero-emission powertrains determined to be ineligible for recall action due to removed or altered components.
 - 1.10 A listing of the identification numbers of the zero-emission powertrains subject to recall but for whose repair the manufacturer has not been invoiced. This listing shall be supplied in a standardized computer data storage device to be specified by the Executive Officer. The frequency of this submittal may be changed by the Executive Officer depending on the needs of recall enforcement
 1. 11 A copy of any service bulletins transmitted to dealers or other authorized repair establishments that relate to the nonconformity to be corrected and which have not previously been reported.
 - 1.12 A copy of all communications transmitted to zero-emission powertrain owners which relate to the nonconformity and which have not previously been submitted.
2. If the manufacturer determines that any of the information submitted to the Executive Officer pursuant to section U.1 above has changed or was incorrect, revised information and an explanatory note shall be submitted. Responses to subsections T.1.5, T.1.6, T.1.7, T.1.8, and T.1.9 above shall

be cumulative totals.

3. The manufacturer shall maintain in a form suitable for inspection, such as computer information storage devices or card files, and shall make available to the Executive Officer or his or her authorized representative upon request, the names and addresses of zero-emission powertrain owners:
 - 4.1 To whom notification was given;
 - 4.2 Whose zero-emission powertrains were repaired or inspected under the recall plan; and
 - 4.3 Who were determined not to qualify for such recall action due to removed or altered components.
4. The information gathered by the manufacturer to compile the reports required by these procedures shall be retained for not less than one year beyond the warranty period of the zero-emission powertrains and shall be made available to the Executive Officer upon request.

U. Penalties and Extension of Time

1. Failure by a manufacturer to carry out all recall actions ordered by the Executive Officer pursuant to sections L through T of these procedures shall constitute a violation of Health and Safety Code Section 43105.
2. The Executive Officer may extend any deadline in the plan if he or she finds in writing that a manufacturer has shown good cause for such extension.

V. General Provisions for Reporting Requirements

1. The provisions regarding applicability of the failure reporting procedures and the definitions shall be the same as those set forth in section A above.
2. The requirement to file warranty information reports and field information reports for a given class or category of zero-emission powertrains shall be applicable for the warranty period but not to exceed the warranty period of the zero-emission powertrains.

W. Alternative Procedures

1. A zero-emission powertrain manufacturer may use an alternative procedure to those specified in Sections X and Y.1, provided the Executive Officer has determined that the alternative procedure will produce substantially equivalent results. In making such a determination, the Executive Officer shall consider the capacity of the alternative procedure to:

- 1.1 Ensure early detection of failing components within the warranty period of the zero-emission powertrains;
 - 1.2 Track failing components by certification family;
 - 1.3 Assure prompt notification of the Executive Officer when a systematically failing component is indicated;
 - 1.4 Provide objective, complete and easily monitored data; and
 - 1.5 Be audited by the Executive Officer.
2. If, in order to comply with the requirements of Section W.1, X or Z.1, a manufacturer elects to develop a system based upon a sampling of representative California dealerships, such plan must be reviewed and approved by the Executive Officer prior to its implementation.

X. Failure Levels Triggering Recall

A zero-emission powertrain family, test group or subgroup shall be subject to a recall when the number of screened failures of a specific warranted part exceeds the failure level set forth below, unless the Executive Officer determines from the information report that a recall is unnecessary pursuant to the criteria set forth in Section AB.1 and AB.2. A zero-emission powertrain in a certification family is subject to recall at the following failure levels: 4 percent or 25 (whichever is greater) for 2021 and subsequent model-year zero-emission powertrains.

Y. Unscreened Warranty Information Report

1. A manufacturer shall:
 - 1.1 Review warranty claim records for each zero-emission powertrain certification family on a quarterly basis to determine and compile by cumulative total the number of claims made for warranted parts. The data compiled shall be based on all warranty claims, without any prescreening of data as to the validity of the claims.
 - 1.2 Categorize warranty claims for each zero-emission powertrain certification family by the specific warranted part replaced or repaired.
 - 1.3 On the basis of data obtained subsequent to the effective date of these regulations, file an unscreened warranty information report for each quarter when the cumulative number of unscreened warranty claims for a specific warranted component reaches 1 percent or 10 (whichever is greater) for zero-emission powertrains in a certification family.
2. The unscreened warranty information report shall contain the following information in substantially the format outlined below:

- 2.1 The manufacturer's corporate name.

- 2.2 A description of each class or category of zero-emission powertrain affected by a warranty replacement or warranty repair of a specific component, including model year, certification family, mode code, and build date.
 - 2.3 The number and percentage of zero-emission powertrains in each certification family for which a warranty replacement or warranty repair of a specific warranted was identified.
 - 2.4 A short description of the specific warranted part that was replaced or repaired under warranty.
3. Unscreened Warranty information reports shall be submitted not more than 25 days after the close of a calendar quarter. Subsequent to the filing of a warranty information report, a manufacturer shall submit quarterly reports updating the number and percentage of warranted part warranty claims with the most recent information, unless a recall has been implemented. Unscreened warranty information reports and updates shall be submitted to the Chief, Emission Compliance, Automotive Regulations and Science Division, 9528 Telstar Avenue, El Monte, California 91731.

Z. Field Information Report

1. On the basis of data obtained and reported pursuant to section Y of these procedures, a manufacturer shall file a field information report not more than 45 days after an unscreened warranty information report indicates that a cumulative total of unscreened warranty claims for a specific warranted part is found to exist in excess of the percentage of zero-emission powertrains specified in Section X, unless the manufacturer has committed to perform a recall by notifying the Executive Officer of its intent in writing within the 45-day period. A recall plan must be submitted within 45 days of that notice.
2. All field information reports shall be submitted to the Chief, Emission Compliance, Automotive Regulations and Science Division, 9528 Telstar Avenue, El Monte, California 91731, and shall contain the following information in substantially the format outlined below:
 - 2.1 The manufacturer's corporate name.
 - 2.2 A field information report number assigned by the manufacturer which shall be used in all related correspondence.
 - 2.3 A description of each class or category of zero-emission powertrain affected by a warranty replacement or warranty repair of a specific component, including model year, certification family, and affected zero-emission powertrain families.
 - 2.4 A description of the component that failed or was replaced or repaired under warranty, the failure and the probable cause of the failure.
 - 2.5 The number and percentage of zero-emission powertrains in each

certification family for which a failure of a specific component was identified.

- 2.6 The total number and percentage of unscreened warranty claims and failures of a specific component projected to occur during the certification family's warranty period and a description of the method used to project this number.
- 2.7 An estimated date when the failure of a specific component will reach the levels specified in section X of this part.

AA. Screened Warranty Information Report

1. A manufacturer shall file a screened warranty information report:
 - 1.1 For vehicles, when the manufacturer-validated failure of a specific zero-emission powertrain component exceeds the percentages specified in section X of these procedures. A screened warranty information report shall not be required sooner than 45 days after the field information report has been submitted to the Executive Officer.
 - 1.2 Not more than 45 days after the Executive Officer, with cause, requires such a report. For purposes of this section, "cause" shall be based upon any information that indicates a failure of significant scope is occurring and might necessitate a recall and information gathered from consumer complaints.
2. No screened warranty information report shall be required if a manufacturer has committed to perform a recall by notifying the Executive Officer of its intent in writing after the failure of a specific zero-emission powertrain component exceeds the percentages specified in section X of these procedures. A recall plan shall be submitted within 45 days of the manufacturer's notification of intent to perform a recall.
3. All screened warranty information reports shall be submitted to the Chief of the Emissions Compliance, Automotive Regulations and Science Division, 9528 Telstar Avenue, El Monte, CA 91731, and shall contain the following information in substantially the format outlined below.
 - 3.1 The manufacturer's corporate name.
 - 3.2 The field information report number from which the failure was first reported, if applicable.
 - 3.3 A description of each class or category of California-certified zero-emission powertrains affected by the failure including model-year, certification family, and such other information as may be required to identify the vehicles affected.
 - 3.4 A description of the component that failed, the failure and the probable cause of failure.

3.5 A description of any problems or impact on other vehicle factors such as performance, range, durability, and safety likely to result from the failure.

AB. Evaluation of Need for a Recall

1. Once the warranty information report is filed, the Executive Officer shall evaluate the failure to determine whether a recall is necessary. Factors to be considered shall include but are not limited to the following:
 - 1.1 The validity of the data;
 - 1.2 Whether the failure results in a warrantable condition;
 - 1.3 The failure rates and the timing and extent of a remedy if no recall is required;
 - 1.4 Other factors specific to the failure;
 - 1.5 Service and repairability programs available to zero-emission powertrain owners free of charge to address failure of affected components; and
 - 1.6 Extended warranty provisions offered to zero-emission powertrains owners in lieu of component replacement.
2. Notwithstanding section AB.1 above, a recall shall not be required if the manufacturer submits information with the warranty information report that demonstrates to the satisfaction of the Executive Officer that the failure is likely to be corrected under the warranty program or other in-use maintenance procedure shortly after the inception of the problem.
3. If a manufacturer can identify a subgroup of a zero-emission powertrain certification family that is subject to a failure, a recall may be limited to that subgroup with Executive Officer approval.