PROCEDURES FOR EXEMPTION OF ADD-ON AND MODIFIED PARTS

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State of California
AIR RESOURCES BOARD

PROCEDURES FOR EXEMPTION OF ADD-ON AND MODIFIED PARTS

I. Applicability

These criteria apply to add-on or modified parts, as defined in Section 1900 (b), (1) and (10), Chapter 3, Title 13, California Code of Regulations. Examples of emission related parts are shown in Appendix 1 of these procedures. Such parts require an exemption from the prohibitions of Sections 27156 and 38391 of the California Vehicle Code (VC 27156, and VC 38391) in order to be legally advertised, offered for sale, sold, or installed in California. The Executive Officer shall grant an exemption to VC 27156 and VC 38391 for parts that satisfy criteria as specified in these procedures.

II. Application for Exemption by the Board from the Prohibitions of Sections 27156 and 38391 of the California Vehicle Code.

A. Application

The manufacturer of an add-on or modified part shall file an application for exemption for each generic category, as defined in Paragraph III.G of these procedures. The application shall be in

writing, and must be signed by a person authorized to act on behalf of the manufacturer.

B. Classification

Within each generic category, the add-on or modified part shall be further classified into two major groups which determine the type of application for exemption and supplementary material to be submitted. The two major groups are: 1) General Criteria parts and 2) Compliance Criteria parts.

C. General Criteria Parts

General Criteria parts are those add-on or modified parts for which vehicle or engine emission testing may be required in accordance with Paragraph III of these procedures. For General Criteria parts, the applicant shall complete information provided in the application form of Appendix 2 or 3 as appropriate. In addition to the application, the Executive Officer shall require the applicant to submit other design or technical information, photographs, and a sample of the part, if the information submitted in the application does not permit a proper evaluation of the add-on or modified part. Upon request of the applicant, the Executive Officer shall return any sample part within 30 days, after the exemption request is either granted, denied, or withdrawn.

D. Compliance Criteria Parts

Compliance Criteria parts are those parts for which explicit criteria are satisfied in writing, and which do not require vehicle or engine emission testing to obtain an exemption from VC 27156 and VC 38391. For Compliance Criteria parts, the applicant must submit the information outlined in the application form contained in Appendix 4a. The Executive Officer shall require the applicant to submit an as-built sample of the add-on or modified part in addition to a completed application, if the application does not provide sufficient information to determine that the part complies with the Compliance Criteria. Upon request of the applicant, the Executive Officer shall return the add-on or modified part within 30 days after the exemption is granted, denied, or withdrawn. Immediately below is the list of parts for which Compliance Criteria have already been developed, and for which the criteria are included in Appendices 4a through 4f. As they are developed, Compliance Criteria for additional parts will be added to this list.

E. Eligible Compliance Criteria Parts List

1) Exhaust Headers for Non-feedback Controlled Catalyst-Equipped Vehicles

2) Intake Manifolds for Non-EGR Vehicles Only

3) Ignition System Components (excluding distributors)

4) Ignition Distributors

5) Intercoolers

F. Application Forms

In filing an application for exemption, use of the attached forms for both General Criteria parts (Appendices 2 and 3 where applicable), and Compliance Criteria parts (Appendices 4a through 4f where applicable) is required.

III. Emission Testing Required by the Executive Officer for General Criteria Parts

A. Vehicle Selection

The Executive Officer shall require the applicant to conduct emission testing in accordance with Paragraph III.E or III.F, unless the Executive Officer determines, based upon a review of available information, that the part for which an exemption is sought meets the standards and requirements set forth in these procedures, and does not significantly affect emissions. Upon request by the applicant, the Executive Officer shall provide a list of test vehicles, including alternates. When selecting test vehicles, the

Executive Officer shall consider the worst case and/or the most popular vehicle configurations as defined in paragraph III.H.2 of these test procedures. The number of vehicles to be tested is specified in paragraph H of this section. Manufacturers are advised to consult with the Air Resources Board staff before conducting any testing in support of an exemption application.

B. Vehicle Mileage

Each test vehicle shall be a California certified version having accumulated not less than 4,000 miles in normal operation. In the event that a manufacturer acquires a vehicle with less than 4,000 miles, the vehicle mileage must be brought to 4,000 miles by driving the vehicle on the road, or by accumulating mileage on a chassis dynamometer utilizing the CVS-75 urban cycle. The Executive Officer shall allow test vehicles with less mileage if the applicant can demonstrate emission stability.

C. Test Laboratory

The applicant shall have any required testing performed at a laboratory properly equipped to conduct such tests. The test vehicle(s) shall be under the control of the laboratory for the entire test period. Return of the test vehicle(s) to the applicant during the test period may invalidate prior test results.

D. Additional or Alternate Testing

If the Executive Officer finds that the emission testing specified in Paragraphs III.E or III.F is not adequate to characterize the emissions performance or durability of a General Criteria add-on or modified part, the Executive Officer shall require alternate emission testing (including smog check, highway cycle or monitoring of toxic emissions) and/or functional and bench testing. If the Executive Officer requires such additional or alternate testing of vehicles, the Executive Officer shall notify the applicant of the requirement prior to the start of any other required testing and shall provide the applicant with reasons or justification for imposing the alternate or additional requirements. The Air Resources Board may conduct confirmatory tests at the option of the Executive Officer. Confirmatory tests, if required, shall be performed by ARB within 30 days of receipt of all data, materials, and vehicles necessary for the conduct of the test. The results of ARB confirmatory tests shall be reported to the applicant within 20 days of completion of all ARB testing. The applicant shall be given the opportunity to observe the confirmatory tests. The confirmatory testing conducted by the Air Resources Board shall utilize the same procedure and test type as that used by the applicant.

E. Authorized Test Procedures for Light-duty Vehicles

Except as provided herein, either of the following two test procedures specified below may be used to satisfy the exhaust emission testing requirements of these procedures subject to approval of the Executive Officer:

1) Cold start CVS-75 Federal Test Procedure (FTP) as specified under the Federal Test Procedure, Title 40, Code of Federal Regulations, Part 86, Subpart B, July 1, 1988.

2) "Cold 505" - the first 505 seconds of the Environmental Protection Agency (EPA) Urban Dynamometer Driving Schedule for Light-Duty Vehicles and Light-Duty Trucks as prescribed in the Federal Test Procedure, Title 40, Code of Federal Regulations, Part 86, Subpart B, Appendix I, July 1, 1988.

Unless specifically required by the Executive Officer, the evaporative emission tests of the cold start CVS-75 test procedure may be omitted. When the Executive Officer finds that evaporative emission testing is required to fully characterize an add-on or modified part, because the part either modifies or affects the emissions of the evaporative emission controls, only the cold start CVS-75 test procedure shall be utilized.

F. Authorized Test Procedures for Heavy-duty Vehicles

When the Executive Officer requires exhaust emission testing of a vehicle with a gross vehicle weight rating (GVWR) greater than 6,000 lbs. or an engine designed for installation in such a vehicle, the applicant shall use one of the test procedures provided herein. Prior to the start of the exhaust emission testing, the Executive Officer shall approve the test procedure, test conditions, and the evaluation procedure to be used by the applicant.

1. Applicants may test vehicles with a GVWR of less than 14,000 lbs. that were originally certified to a chassis dynamometer based California vehicle exhaust emission standard, using the procedures provided in Paragraph III.E, upon approval by the Executive Officer. The test equipment settings shall be the same as those originally used to certify the vehicle. The applicant with approval of the Executive Officer may use the specific evaluation criteria provided in Paragraph IV.F.

2. Applicants may test vehicles with a GVWR of less than 14,000 lbs., that are equipped with an engine originally certified to a California engine dynamometer exhaust emission standard using the test procedures provided in Paragraph III.E, upon approval by the Executive Officer. The equivalent test weight of the test vehicle shall be equal to the vehicle curb weight plus one-half of the difference between the GVWR and the curb weight of

the vehicle. The road load horsepower setting for the chassis dynamometer shall be based on the frontal area of the test vehicle without modifications. Diesel-powered test vehicles originally certified to an engine dynamometer cycle may be exhaust emissions tested using the procedure of Paragraph III.E.1, omitting the required cold soak period. The specific evaluation criteria for vehicles tested herein shall be limited to the comparative test criteria of Paragraph IV.F.2.a.

3. Applicants who submit vehicles for vehicle applications greater than 14,000 lbs. GVWR may submit any engine or chassis dynamometer test data as demonstration of compliance with these procedures, upon approval of test procedures by the Executive Officer. Prior to the start of the emission testing, the applicant shall submit a detailed description of the test procedure and calculations for approval by the Executive Officer. When the Executive Officer approves an alternate test procedure, the specific limits for determining compliance shall be specified prior to the start of the emissions testing.

G. Categorization of Parts - Generic Categories

Any add-on or modified part will be categorized according to its "Generic Category". For example, the term intake manifold shall define the entire generic category for this part. Generic categories shall include:

Turbochargers

Superchargers

Intercoolers

Carburetors

Fuel Injection Systems

Intake Manifolds

Ignition Systems (excluding Distributors)

Ignition Distributors

Electronic Control Units

Camshafts

Other Internal Engine Components

Evaporative Control System

Positive Crankcase Ventilation System

Exhaust Gas Recirculation System

Air Injection System

Fuel Filler Necks with Restrictions

Thermal Reactors

Exhaust Systems

For other components which in any way can affect emissions, applicants should check with the Executive Officer for a determination of the appropriate breadth of the generic category.

H. Number and Type of Test Vehicles Required

1) When required by the Executive Officer, add-on or modified parts included in the Generic Categories of Paragraph III.G, shall be emission tested using one of the test procedures specified in Paragraph III.E or III.F as applicable.

2) The required number and type of test vehicles is the same for each optional test procedure specified in paragraph III.E or III.F of these procedures. The test vehicle types will be the "worst case" and/or "most popular" as determined by the Executive Officer. Selection of a "most popular" test vehicle shall be based on the vehicle configuration with the highest projected sales volume of the add-on or modified part. Selection of a "worst case" test vehicle shall be based on the engine displacement and vehicle test weight which produce the greatest stress on the emission related components. Unless otherwise indicated by engineering evaluation of information supplied by the add-on or modified part manufacturer, or available to the ARB staff from other sources, the Executive Officer shall select the largest engine displacement within the highest test weight class as a "worst case" vehicle. When the Executive Officer finds that a "worst case" vehicle can not be obtained with a reasonable effort or cost to the applicant, a vehicle with the same engine displacement but different test weight may be substituted. When the Executive Officer makes such a finding, the substitute

vehicle may be emission tested at the same test weight and road load horsepower as that of the "worst case" vehicle. If the applicant elects to test the substitute vehicle at a test weight less than that of the "worst case" vehicle, the Executive Officer shall restrict the exemption for the add-on or modified part to vehicles with the lower weight, unless the Executive Officer determines that the lower weight vehicle adequately represents the heavier vehicle substituted for in all ways related to emissions. The number of vehicles the applicant will be required to emission test depends on the application type and is provided herein.

a) Universal Application - Refers to the generic categories in which the add-on or modified part exemption application applies to the product line of four or more vehicle or engine manufacturers. In such cases the applicant shall be required to emission test a maximum of four different model vehicles or engines.

b) Less Than Universal Application - Refers to the generic categories in which the add-on or modified part exemption is applicable to the product line of two or three vehicle or engine manufacturers. In such cases the add-on or modified part manufacturer shall be required to emission test a number of vehicles, or engines equal to or less than the number of applicable manufacturers.

c) Single Manufacturer Application - Refers to the generic categories in which the add-on or modified part exemption application only applies to one vehicle or engine manufacturer. In such cases the applicant may be required to emission test no more than one vehicle or engine.

IV. Evaluation Criteria

A. Basis of Emissions Evaluation

The Executive Officer shall review the applicant's emission test data and the Air Resources Board test results, if any, to determine if the add-on or modified part increases emissions. In the absence of any emission test data, the Executive Officer shall use good engineering judgment and the results of any bench, functional, emission test results from similar parts, or Compliance Criteria, if applicable, in making the determination regarding the effect of the add-on or modified part on emissions.

B. Resolution of Discrepancies

In the event of discrepancies between the Air Resources Board test results and the applicant's test results, the Executive Officer's evaluation may be based solely on the Air Resources Board test results. The Executive Officer shall inform the applicant of any such discrepancies, and shall endeavor to resolve the conflict

between the test results. If the conflict cannot be resolved, the Executive Officer shall inform the applicant that there are still discrepancies and that the Air Resources Board test results will be used.

C. Performance and Driveability

The Executive Officer shall evaluate the effects of the add-on or modified part on the vehicle's performance or driveability. If the add-on or modified part degrades the driveability or vehicle performance such that owners may be encouraged to adjust the engine settings or tamper with required emission control systems to improve driveability or vehicle performance, the Executive Officer may find that the add-on or modified part will increase emissions.

D. Durability

If the Executive Officer has reason to believe, on the basis of an engineering evaluation, that an add-on or modified part will affect the durability of the vehicle emission control system, or that in the past the part did not demonstrate durability equivalent to the part or system replaced or added to, he or she shall find that the modification will increase emissions. In such cases the applicant shall be required to submit durability data in order to show that the durability of the vehicle emission control system is not

affected, and/or that the add-on or modified part demonstrates adequate durability.

E. On-board Diagnostic Requirements

The add-on or modified part manufacturer shall be responsible for ensuring that, if applicable, the manufacturer's part will not affect the proper operation of vehicle's on-board diagnostic system or cause a fault code to be erroneously stored and/or the malfunction indicator light to become illuminated.

F. Specific Evaluation Criteria for General Criteria Parts Subject to Emission Testing

When the Executive Officer requires an add-on or modified parts manufacturer to perform emission testing, the applicant shall demonstrate compliance with the requirements of these test procedures using one of the two optional procedures contained herein.

1) New Vehicle Exhaust Emission Standards

a) The add-on or modified part manufacturer may demonstrate compliance with these procedures by showing that the exhaust emissions from the test vehicle with the add-on or modified part installed are in compliance with the California new

vehicle exhaust emission standards for the vehicle class and model year of the test vehicle. An applicant may elect to use this optional method of compliance only when the emissions test data were collected using the cold start CVS-75 or Cold 505 test procedures provided in Paragraph III.E or the heavy-duty test procedure provided in Paragraph III.F. To demonstrate compliance with the applicable emission standards, each emission test result shall be adjusted by the application of a deterioration factor. The Executive Officer shall specify the use of the certification deterioration factor provided in the original vehicle manufacturer's certification application for the model and model year of the test vehicle. The deteriorated emission test results shall be in compliance with these procedures only if they are equal to or less than the California new vehicle exhaust emission standards for the test vehicle. The applicant shall be permitted one retest if the initial emission test results fail to demonstrate compliance with these procedures. The results of the initial test and the retest will be averaged, and the average number must meet the standards set for the single test in order to demonstrate compliance.

2) Comparative Emission Testing (Baseline vs Modified)

a) The add-on or modified part manufacturer may elect to conduct comparative emission tests to demonstrate compliance with

these procedures. To demonstrate compliance by this method, the manufacturer shall conduct a minimum of two emission tests using any of the test procedures specified in Paragraphs III.E or III.F. The first, or baseline emission test, shall be performed with the test vehicle or engine in the as-built configuration. For the second, or device emission test, the vehicle or engine shall be modified by installation of the add-on or modified part. The add-on or modified part shall be in compliance with these procedures if the difference between the device emission test result and the baseline emission test result (both of which are measured in grams per mile or grams per test as applicable) is equal to or less than the larger of the limits for each of the component elements of exhaust emissions listed below:

Hydrocarbon	0.10 grams per mile or 10% of baseline
Carbon Monoxide	1.0 grams per mile or 15% of baseline
Oxides of Nitrogen	0.10 grams per mile or 10% of baseline
Particulates (diesel only)	0.03 grams per mile or 15% of baseline
Evaporative Emissions	0.2 grams per test or 10% of baseline

When the Executive Officer requires or allows testing other than the explicit testing of Paragraphs III.E or III.F, the limits for determining compliance shall be specified prior to the start of any testing.

b) Each test vehicle must also be subjected to a thorough examination prior to the baseline test to detect, and have corrected, possible defects and deviations from manufacturer's specifications in emission related parts. The baseline emissions of the test vehicle should be typical for that particular make, model and year. Baseline typical vehicle emissions shall be determined by using the data obtained from similar vehicles. The appropriate factors for the particular vehicle being tested will be supplied by ARB upon request.

c) If a vehicle exceeds typical emission values, the applicant may make a full diagnostic evaluation of the vehicle, make any necessary repairs, and retest the vehicle. If no abnormal conditions of the engine or the emission controls are noted, the vehicle shall be accepted as a test vehicle, if approved by the Executive Officer, and the emission data from the vehicle shall be used for comparison with device test results. The applicant may forego the above and replace the test vehicle or select another test vehicle from the given list of alternative vehicles.

d) After the baseline testing has been completed, prior approval is required from the Executive Officer before any servicing, maintenance, or part replacement is made, except those that are in accordance with the written instructions provided with the application. The same type of test fuel shall be used for

all tests unless otherwise specified in writing by the manufacturer.

e) Each vehicle selected shall be tested in the modified and unmodified configurations. All engine settings shall be adjusted to vehicle manufacturer's specifications in the unmodified configuration (baseline) test. The add-on part or modified part shall be installed in accordance with the written instructions provided with the application under the supervision of test laboratory personnel. Engine settings shall be recorded and submitted with test results for each test in both the modified and unmodified configurations. The forms provided in Appendix 5 may be used as a guide.

G. Specific Evaluation for Compliance Criteria Parts

In determining whether specified add-on or modified parts are exempted from the prohibitions of Sections 27156 and 38391 of the California Vehicle Code under the provisions of Compliance Criteria, the Executive Officer shall apply evaluation criteria which consist of documentation that the part, as built, satisfies the criteria outlined in the Compliance Criteria for that part as listed in Appendices 4b through 4f. Additionally, the part manufacturer may be required upon submission of the application for exemption, to submit an as-built part to confirm that the specifications outlined in the applicable Compliance Criteria have been met. The complete

package of Compliance Criteria for eligible parts is included in Appendices 4a through 4f. Finally, as noted in paragraph E above, the part manufacturer must ensure that, if applicable, the part will not affect the proper operation of the on-board diagnostic system, or erroneously cause a fault code to be stored and/or the malfunction indicator light to illuminate.

V. Action on the Application

A. Applications Based on Vehicle Emission Testing for General Criteria Parts

The Air Resources Board staff shall initially evaluate the application, the test data and any other pertinent information concerning the add-on or modified part. On the basis of the information provided by the applicant and/or the Air Resources Board test results, the staff will make a recommendation to the Executive Officer. If the Executive Officer determines that an add-on or modified part will not reduce the effectiveness of the emission control system or result in emissions that exceed the applicable model-year state or federal emission standards for each vehicle, he or she shall issue an Executive Order exempting the add-on or modified part from the prohibitions of Vehicle Code Sections 27156 and 38391. This Executive Order may restrict the installation of the add-on or modified part certified by engineering evaluation to certain makes, model-years, or classes of vehicles. As a condition

of exemption the applicant shall not use the Executive Order as an endorsement or approval by the Air Resources Board.

The Executive Officer shall deny the applicant's exemption request if the add-on or modified part increases emissions more than allowed under the Evaluation Criteria, paragraph IV.F.1.a, or F.2.a. If the Executive Officer denies the applicant's exemption request, the Executive Officer shall convey by letter notice of and the reasons for denial.

B. Applications Based on Compliance Criteria for Eligible Compliance Criteria Parts

The Executive Officer shall review Compliance Criteria applications for proper content. Additionally, the Executive Officer may require the applicant to submit an as-built part to verify that the criteria for that part have been satisfied. Upon determination that the application is properly completed, and that the part does in fact comply with the specifications outlined in the Compliance Criteria, the Executive Officer shall issue an Executive Order exempting the add-on or modified part from the prohibitions of Vehicle Code Sections 27156 and 38391. This Executive Order may restrict the installation of the add-on or modified part to certain makes, model-years, or classes of vehicles. As a condition of exemption the applicant shall not use the Executive Order as an endorsement or approval by the ARB.

C. Labeling Requirements

The add-on or modified part manufacturer shall provide a product information label and complete instructions for its installation in an under-hood location readily visible to the average person with each part or kit of parts sold. The product information label shall contain, at a minimum, the product name as exempted, ARB executive order number using the format "CARB D-XXX," manufacturer's name, and the manufacturer's address. The label installation instructions shall contain a warning to the consumer in bold lettering that the product information label is required to aid in passing the California Smog Check program. The product information label shall be designed for a minimum life of five years.

When the installation of the add-on or modified part requires removal of any emission control component, re-routing of any vacuum hose, or changes to the vehicle manufacturer tune-up specifications, the product information label shall provide a complete description of the required changes and the new tune-up specifications. The add-on or modified part manufacturer shall submit a facsimile or prototype of the product information label and the installation instructions with each application for exemption.

State of California
AIR RESOURCES BOARD

APPENDIX 1

Emission Related Parts List

Adopted November 4, 1977
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The following list of components are examples of emission related parts as defined in Section 1900 (b) (3), Chapter 3, Title 13, California Code of Regulations.

I. Carburetion and Air Induction System

A. Air Induction System:

1. Temperature sensor elements
2. Vacuum motor for air control
3. Hot air duct & stove
4. Air filter housing & element
5. Turbocharger or Supercharger
6. Intercooler

B. Emission Calibrated Carburetors:

1. Metering jets
2. Metering rods
3. Needle and seat
4. Power valve
5. Float circuit
6. Vacuum break
7. Choke mechanism
8. Throttle control solenoid
9. Deceleration valve
10. Dashpot
11. Idle stop solenoid, anti-dieseling assembly
12. Accelerating pump
13. Altitude compensator

C. Mechanical Fuel Injection:

1. Pressure regulator
2. Fuel injection pump
3. Fuel injectors
4. Throttle-position compensator
5. Engine speed compensator
6. Engine temperature compensator
7. Altitude cut-off valve
8. Deceleration cut-off valve
9. Cold-start valve

D. Continuous Fuel Injection:

1. Fuel pump
2. Pressure accumulator
3. Fuel filter
4. Fuel distributor
5. Fuel injectors
6. Air-flow sensor
7. Throttle-position compensator
8. Warm-running compensator
9. Pneumatic overrun compensator
10. Cold-start valve

E. Electronic Fuel Injection:

1. Pressure regulator
2. Fuel distribution manifold
3. Fuel injectors
4. Electronic control unit
5. Engine speed sensor
6. Engine temperature sensor
7. Throttle-position sensor
8. Altitude/manifold-pressure sensor
9. Cold-start valve

F. Air Fuel Ratio Control:

1. Frequency valve
2. Oxygen sensor
3. Electronic control unit

G. Intake Manifold

II. Ignition System

A. Distributor:

1. Cam
2. Points
3. Rotor
4. Condenser
5. Distributor cap
6. Breaker plate
7. Electronic components (breakerless or electronic system)

B. Spark Advance/Retard Systems:

1. Centrifugal advance mechanism:

   a. weights
   b. springs

2. Vacuum advance unit

3. Transmission controlled spark system:

   a. Vacuum solenoid
   b. Transmission switch
   c. Temperature switches
   d. Time delay
   e. CEC valve
   f. Reversing relay

4. Electronic spark control systems:

   a. Computer circuitry
   b. Speed sensor
   c. Temperature switches
   d. Vacuum switching valve

5. Orifice spark advance control system:

   a. Vacuum by-pass valve
   b. OSAC (orifice spark advance control) valve
   c. Temperature control switch
   d. Distributor vacuum control valve

6. Speed controlled spark system:

   a. Vacuum solenoid
   b. Speed sensor and control switch
   c. Thermal vacuum switch

C. Spark Plugs

D. Ignition Coil

E. Ignition Wires

III. Mechanical Components

A. Valve Trains:

1. Intake valves
2. Exhaust valves
3. Valve guides
4. Valve springs
5. Valve seats
6. Camshaft

B. Combustion Chamber:

1. Cylinder head or rotor housing[1]
2. Piston or rotor[1]

IV. Evaporative Control System

A. Vapor Storage Canister and Filter

B. Vapor Liquid Separator

C. Filler Cap

D. Fuel Tank

F. Canister Purge Valve

V. Positive Crankcase Ventilation System

A. PCV Valve

B. Oil Filler Cap

C. Manifold PCV Connection Assembly

VI. Exhaust Gas Recirculation System

A. EGR Valve:

1. Valve body and carburetor spacer
2. Internal passages and exhaust gas orifices

B. Driving Mode Sensors:

1. Speed sensors
2. Solenoid vacuum valve
3. Electronic amplifier
4. Temperature-controlled vacuum valve
5. Vacuum reducing valve
6. EGR coolant override valve
7. Backpressure transducer
8. Vacuum amplifier
9. Delay valves

[1]Rotary (Wankel) engines only

VII. Air Injection System

A. Air Supply Assembly:

1. Pump
2. Pressure relief valve
3. Pressure-setting plug
4. Pulsed air system

B. Distribution Assembly:

1. Diverter, relief, bypass, or gulp valve
2. Check or anti-backfire valve
3. Deceleration control part
4. Flow control valve
5. Distribution manifold
6. Air switching valve

C. Temperature sensor

VIII. Catalyst, Thermal Reactor, and Exhaust System

A. Catalytic Converter:

1. Constricted fuel filler neck
2. Catalyst beads (pellet type converter)
3. Ceramic support and monolith coating (monolith type converter)
4. Converter body and internal supports
5. Exhaust manifold

B. Thermal Reactor:

1. Reactor casing and lining
2. Exhaust manifold and exhaust port liner

C. Exhaust System:

1. Manifold
2. Exhaust port liners
3. Double walled portion of exhaust system
4. Heat riser valve and control assembly

IX. Miscellaneous Items Used in Above Systems

1. Hoses, clamps, and pipes
2. Pulleys, belts, and idlers

X. Computer Controls

1. Electronic Control Unit (ECU)
2. Computer-coded engine operating parameters (including computer chips)
3. All sensors and actuators associated with the ECU

APPENDIX 2

State of California
AIR RESOURCES BOARD

Vehicle Code Sections 27156 and 38391 Exemption Application for General Criteria Parts

1. Name of Applicant _____

   Address _____

   Phone ( ) _____

2. Name of Device Manufacturer* _____

   Address _____

   Phone ( ) _____

3. Name of Authorized Representative** _____

   Address _____

   Phone ( ) _____

4. Test procedure (check one)

   The test procedure to be used is:

   _____ Cold start CVS-75 Federal Test Procedure

   _____ Cold 505

   _____ Hot Start CVS-75 (applicable to some diesel-powered vehicles)

5. Evaluation Criteria (check one)

   This application is for certification to:

   _____ emission standards

   _____ typical baseline emission levels

*If different from name of applicant. Device as used herein is defined to mean add-on or modified part.

**An authorized representative may be required to prove that he/she is authorized to act on behalf of an applicant or manufacturer.

6. Device Name(s) _____

7. Briefly describe the purpose of the device _____

_____

_____

_____

8. Briefly describe the operation of the device _____

_____

_____

_____

9. List vehicle names, model years, engine displacements and systems that are compatible with the device, and for which exemption is requested. Specify the correct device model for each vehicle.

_____

_____

_____

_____

_____

_____

_____

10. The following information is required for the Air Resources Board (ARB) to complete an evaluation. Please place a check mark next to the items that are enclosed with the application and provide an explanation for items that are not checked.

(a) _____ A detailed description of the device including operating principles, cross-sectional drawings, electrical schematics, and other such material to assist the staff in understanding its operation.

(b) _____ Copies of all advertising material to be used in selling the device including a sample or facsimile of the packaging label. (Optional).

(c) _____ A copy of the installation and adjustment instructions and drawings that will be included with the device.

(d) _____ A facsimile or prototype of the identification plate or label to be attached permanently to or imprinted on or near each device offered for sale. The plate or label should be placed such that it is visible after the device is installed, and should contain:

i) the manufacturer's name
ii) the device name and model number
iii) the Air Resources Board exemption number identified as "ARB E.O. No.D-XX".

(e) _____ A facsimile or prototype engine compartment plate or label located adjacent to, but not covering, the vehicle manufacturer's Vehicle Emission Control Information (tune-up) label. This plate or label is only required if a change is recommended to vehicle manufacturer's tune-up parameters. In addition to the recommended tune-up parameter changes, the plate or label must contain the same information as the device label.

(f) _____ A list of the companies or persons that will manufacture the device under license.

11. The ARB may require one or more devices for testing. Do you agree to provide the device(s) free of costs? ____ yes ____ no. The device(s) will be returned only if return is requested at the time the device(s) are submitted.

Emission Statements

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

I understand that an exemption, if granted, does not constitute a certification, accreditation, approval, or any other type of endorsement by the Air Resources Board of any claims concerning alleged benefits of a device. I further understand that no claims of any kind concerning anti-pollution benefits may be made for an exempted device.

Signature of Authorized Representative: _____

Date: _____

APPENDIX 3

State of California
AIR RESOURCES BOARD

Application for Exemption of Aftermarket Turbochargers from Vehicle Code Sections 27156 and 38391

The following information is required before the ARB can evaluate your aftermarket turbocharger system. Please provide the information as completely as possible and explain any unanswered items.

I. Manufacturer of Turbocharger System

Name: _____

Address: _____ Tel. No. _____

Authorized Representative: _____

Title: _____

II. Vehicle Application

If the turbocharger is applicable for two or more engines or chassis models, you may use separate sheets to complete the information.

Make: _____ Model Years: _____

Engine Family: _____ No. Cylinders: _____

Fuel Induction System (No. of barrels, maximum air flow, type of fuel injection system, etc.)

_____

_____

_____

For heavy-duty vehicles and secondary vehicles such as motor homes, complete the following:

Primary Vehicle or Engine Manufacturer _____ Original Chassis or Engine Model _____

Secondary Vehicle Manufacturer _____ Secondary Vehicle Model _____

Gross Vehicle Weight (lbs) _____ Frontal Area _____

III. Test Procedure (check one)

The test procedure to be used is:

_____ Cold start CVS-75 Federal Test Procedure

_____ Cold 505

_____ Hot start CVS-75 (applicable to some diesel-powered vehicles)

IV. Evaluation Criteria (check one)

This application is for certification to:

_____ Emission standards

_____ Typical baseline emission levels

V. Turbocharger System

Name of original (turbocharger) manufacturer

_____

Turbocharger Model No: _____

Type of turbine (e.g., axial flow, radial flow): _____

Area of throat: _____

Distance from centroid area of center of vortex: _____

Area Ratio (A/R) for turbine size: _____

Please supply the turbocharger engineering drawings and turbocharger kit, and complete installation instructions.

VI. Modification to OEM System

In the turbocharging process, you may have to modify certain OEM systems. Check the items that you will modify and explain the modification in detail.

_____ 1. Fuel induction system (this should include carburetor, fuel injection system, fuel pump, fuel filter and all pertinent calibrations and adjustments).

_____ 2. Air intake system such as air cleaners, air flow control sensors, heated air intake system, etc.

_____ 3. Intake manifold (please include any adaptor or devices you plan to use to change fuel-air mixture vaporization).

_____ 4. Ignition system (i.e., distributor, vacuum and centrifugal timing mechanism, points, plugs and all specifications).

_____ 5. Exhaust system such as exhaust manifolds, head pipes, mufflers, etc.

_____ 6. Valve train components including valve clearance adjustments.

_____ 7. Others. (Specify)

VII. Modification to OEM Emission Control Systems

Please check the applicable items and explain the modifications in detail.

_____ 1. EGR system (valve body, vacuum amplifier, vacuum signals, temperature control sensors, back pressure transducer, etc.).

_____ 2. Catalytic converter, thermal reactor and fuel-air mixture feedback control.

_____ 3. Air injection system (air pump, air injection port, by-pass valve, etc.).

_____ 4. Spark control system.

_____ 5. Positive crankcase ventilation system.

_____ 6. Others (Specify)

VIII. The following items are usually required for a Air Resources Board (ARB) evaluation. Please check the ones enclosed and give an explanation for excluding items that are not checked.

_____ 1. Advertising material to be used in selling the turbocharger.

_____ 2. A sample or facsimile of packaging labels.

_____ 3. A sample or facsimile label or identification plate containing the manufacturer's name, turbocharger model and the Air Resources Board exemption number. The exemption number shall be identified: "ARB E.O. No. D-XX". This label

or plate must be permanently attached to or imprinted on each system in a location clearly visible and readable after installation.

_____ 4. A sample or facsimile label showing any changes in tune-up parameters recommended by the turbocharger manufacturer. This label must be permanently attached in a location adjacent to or as close as possible to the OEM Vehicle Emission Control Information label (tune-up label).

_____ 5. Detailed installation and/or maintenance instructions. This should include assembly drawings, parts list, and fuel octane/cetane requirements.

IX. Emission Statements

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

I understand that an exemption, if granted, does not constitute a certification, accreditation, approval, or any other type of endorsement by the Air Resources Board of any claims concerning alleged benefits of a device. I further understand that no claims of any kind concerning anti-pollution benefits may be made for an exempted device.

Signature of Authorized Representative: _____

Date: _____

State of California
AIR RESOURCES BOARD

Vehicle Code Sections 27156 and 38391 Exemption
Application for Compliance Criteria Parts

1. Name of Applicant _____

   Address _____

   Phone (___) _____

2. Name of Device Manufacturer* _____

   Address _____

   Phone (___) _____

3. Name of Authorized Representative** _____

   Address _____

   Phone (___) _____

4. Device Name(s) _____

5. Briefly describe the purpose of the device _____

   _____

   _____

   _____

*If different from name of applicant. Device as used herein is defined to mean add-on or modified part.

**An authorized representative may be required to prove that they are authorized to act on behalf of an apolicant or manufacturer.

6. Briefly describe the operation of the device _____

_____

_____

_____

7. List vehicle names, model years, engine displacements and systems that are compatible with the device, and for which exemption is requested. Specify the correct device model for each vehicle.

_____

_____

_____

_____

_____

_____

_____

8. The requirements contained in Paragraphs II.D and IV.C-E and G. and appendices 4a through 4f must be satisfied by the aftermarket part manufacturer in order to obtain an exemption from the prohibitions of Vehicle Code Sections 27156 and 38391.

9. The ARB may require one or more devices for verifying that the device is built as specified in the application. Do you agree to provide the device(s) free of costs? ____ yes ____ no. The device(s) will be returned only if return is requested at the time the device(s) are submitted.

Emission Statements

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

I understand that an exemption, if granted, does not constitute a certification, accreditation, approval, or any other type of endorsement by the Air Resources Board of any claims concerning alleged benefits of a device. I further understand that no claims of any kind concerning anti-pollution benefits may be made for an exempted device.

Signature of Authorized Representative: _____

Date: _____

APPENDIX 4b

COMPLIANCE CRITERIA FOR EXHAUST HEADERS FOR NON-FEEDBACK CONTROLLED CATALYST-EQUIPPED VEHICLES

1. The exhaust header manufacturer must provide a description of the exhaust headers for non-feedback controlled catalyst-equipped vehicles which clearly demonstrates that the headers meet the following compliance criteria:

* The header system must have provisions for all emission controls present on the production system.

* The number and location of catalysts must not be altered.

* Emission related specifications and/or adjustments must not be altered.

2. Check the items affected by the header installation which can in any way influence exhaust emissions. Please explain the effect in detail.

_____ 1. Exhaust system (e.g., catalytic converter, heat riser, power heat valve, etc.)

_____ 2. Air induction system (e.g., air cleaner, air flow control sensor, hot air duct, etc.)

_____ 3. Intake manifold

_____ 4. Ignition system

_____ 5. Fuel injection or carburetion system, related parts

_____ 6. Electronic control devices and sensors

_____ 7. Evaporative control system

_____ 8. Positive crankcase ventilation system

_____ 9. Exhaust gas recirculation system

_____ 10. Air injection system

_____ 11. Others (specify)

APPENDIX 4c

COMPLIANCE CRITERIA FOR INTAKE MANIFOLDS FOR NON-EGR VEHICLES ONLY

1. The intake manifold manufacturer must provide a description of the intake manifold (for use on non-exhaust gas recirculation (non-EGR) equipped vehicles) which clearly demonstrates that it meets the following compliance criteria:

   * Emission related specifications and/or adjustments including basic timing, idle air/fuel ratio and RPM settings, choke settings, etc. must not be altered;

   * For a given model year of vehicle, the aftermarket intake manifold must accept the installation and proper function of the vehicle's original production carburetor(s) or fuel injector(s) and associated emission control system components (e.g., thermal vacuum switches, choke units, etc.) certified for the vehicle's California engine family;

   * Any intake manifold height increase over the original production intake manifold must allow for the installation and function of associated devices/systems (e.g., carburetor(s), fuel injector(s), air cleaner assembly, hot air duct, etc.) within the confines of the original production hood;

   * The aftermarket intake manifold must be heated by the same means (i.e., exhaust gas or water).

2. Check the items affected by the intake manifold installation which can in any way influence emissions. Please explain the effect in detail.

_____ 1. Exhaust system (e.g., heat valve, heat stove, etc.)

_____ 2. Air induction system (e.g., air cleaner, air flow control sensor, hot air duct, etc.)

_____ 3. Fuel injection or carburetion system and related parts

_____ 4. Ignition system (e.g., component mounting provisions, etc.)

_____ 5. Electronic or vacuum control devices and sensors

_____ 6. Evaporative control system

_____ 7. Positive crankcase ventilation system

_____ 8. Air injection system

_____ 9. Others (specify)

APPENDIX 4e

COMPLIANCE CRITERIA FOR IGNITION DISTRIBUTORS

1. The ignition distributor manufacturer must provide a description of the ignition distributor which clearly demonstrates that it meets the following compliance criteria:

   * Emission related specifications and/or adjustments including basic timing, idle air/fuel ratio and RPM settings, choke settings, etc. must not be altered;

   * The mechanical and vacuum ignition timing curves individually must not under any conditions exceed those of the original production unit or original manufacturer's service replacement unit by more than + 4 crankshaft degrees. A graph shall be required with the mechanical advance curve plotted at 1000, 2000, 3000, and 4000 engine RPM plus, if applicable, the vacuum advance curve plotted at 5, 10, 15, and 20" Hg. Mechanical advance only distributors are exempt from the requirements of this paragraph (but not the above paragraph). In addition, mechanical advance distributors may not exceed the total advance available in the OEM distributor, where total advance represents the sum of the vacuum and mechanical advance.

2. Check the items affected by the ignition distributor installation which can in any way influence emissions. Please explain the effect in detail.

_____ 1. Fuel injection or carburetion system and related parts

_____ 2. Electronic or vacuum control devices and sensors

_____ 3. Others (specify)

APPENDIX 4d

COMPLIANCE CRITERIA FOR IGNITION SYSTEM COMPONENTS (EXCLUDING DISTRIBUTORS)

1. The ignition system components applicable here include coils, capacitive discharge systems, multi-spark systems, electronic spark generators (amplifier units), cylinder to cylinder spark adjusters, knock sensors, spark retard devices, and points conversion kits. The ignition system manufacturer must provide a description of the ignition system component which clearly demonstrates that it meets the following compliance criteria:

   * The ignition system component must have provisions for all emission controls or provide for their equivalent in the production system;

   * Emission related specifications and/or adjustments including basic timing, idle air/fuel ratio, and RPM settings, choke settings, etc. must not be altered;

   * With the installation of the ignition system component, the ignition timing must not under any condition exceed that of the original production system by more than + 4 crankshaft degrees.

2. Check the items affected by the installation of the ignition system components which can in any way influence emissions. Please explain the effect in detail.

_____ 1. Ignition system

_____ 2. Electronic control devices and sensors

_____ 3. Fuel injection or carburetion system and related parts

_____ 4. Exhaust gas recirculation system

_____ 5. Air injection system

_____ 6. Others (specify)

APPENDIX 4f

COMPLIANCE CRITERIA FOR INTERCOOLERS ON TURBOCHARGED OR SUPERCHARGED VEHICLES THAT ARE CATALYST EQUIPPED

1. The intercooler manufacturer must provide a description of the intercooler which clearly demonstrates that it meets the following compliance criteria:

   * The OEM's maximum intake manifold pressure (boost) must not be altered.

   * Installation of the intercooler must not require disconnection of OEM temperature sensor, or alteration of OEM temperature sensor design specifications.

   * The emission related specifications must not be altered (tune-up specifications must not be altered).

   * Fuel system calibration must not be altered.

2. Check the items affected by the intercooler installation which can in any way influence emissions. Please explain the effect in detail.

_____ 1. Exhaust system (e.g., heat valve, heat stove, etc.)

_____ 2. Air induction system (e.g., air cleaner, air flow control sensor, hot air duct, etc.)

_____ 3. Fuel injection or carburetion system and related parts

_____ 4. Electronic or vacuum control devices and sensors

_____ 5. Catalyst system

_____ 6. Exhaust gas recirculation system

_____ 7. Air injection system

_____ 8. Computer calibration on chip

_____ 9. Turbocharger or supercharger system

_____ 10. Ignition system

_____ 11. Others

APPENDIX 5

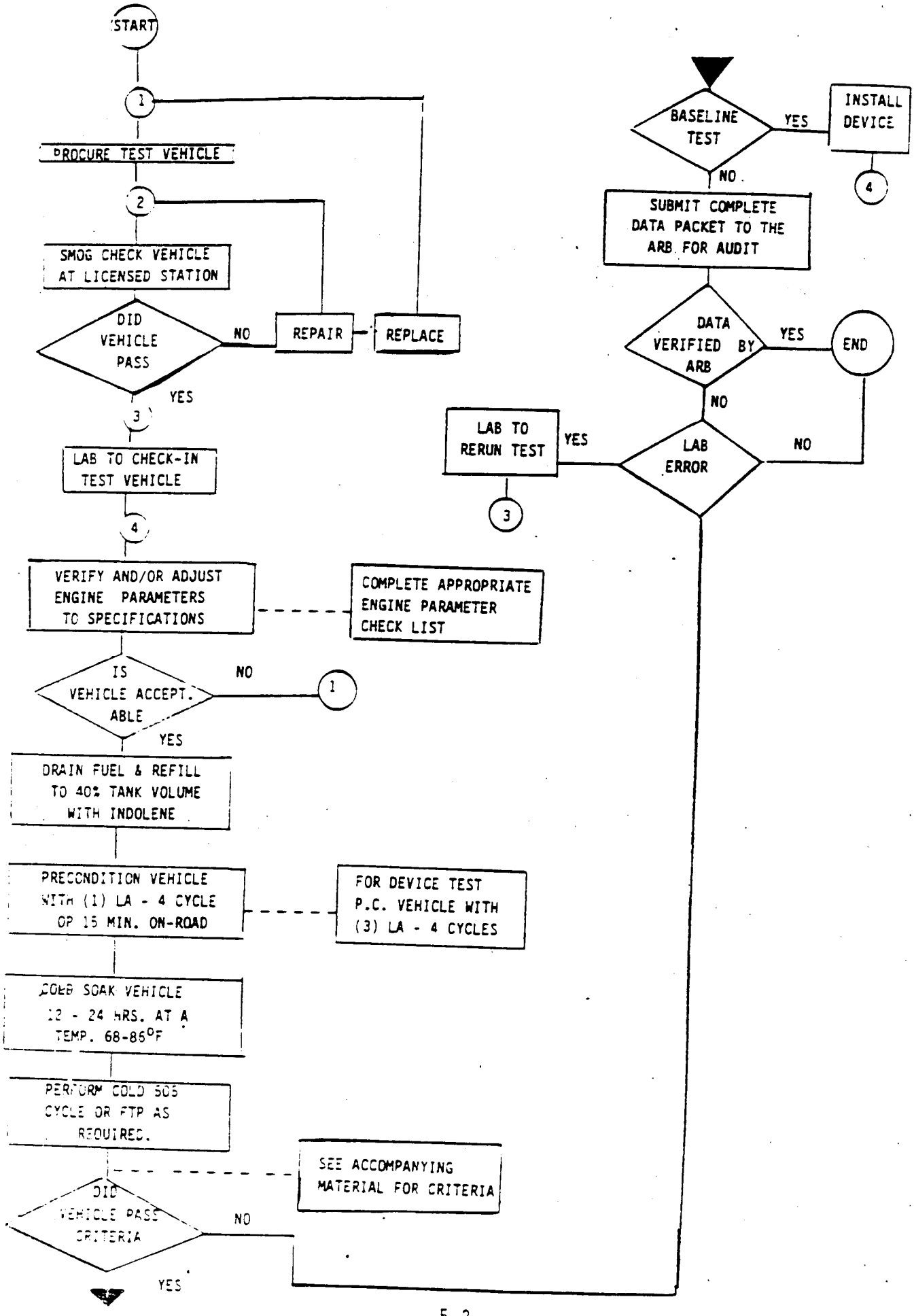
Test Vehicle Flowchart and Documentation

The forms contained in this Appendix are intended to provide the add-on or modified part manufacturer with a guide to be followed in pursuit of an exemption from the prohibitions of California Vehicle Code Sections 27156 and 38391. The completion of these forms will not guarantee an exemption from Vehicle Code Sections 27156 and 38391, but will ensure that the ARB has a record of the procedures followed and test vehicle parameters noted. Explicit documentation of engine parameters, etc. is encouraged, but not required.

Contents:

	Page
Test Vehicle Flowchart	5-2
Test Vehicle Check-in Sheet	5-3
Engine Parameter Data Sheet	5-4

TEST VEHICLE FLOWCHART



Test Vehicle Check-in

Mo Day Yr

Vehicle No. | Year | Make | Model | Mileage

Eng. Displ. | Trans. | A/C | Vehicle Identification No.

Eng. Family (Emission Label) | Inertia | AHP

1. Check exhaust system for leaks ____
2. Check fuel system for leaks ____
3. Check belts and hoses ____
4. Check emission hose routing ____
5. Check fluid levels: Engine oil ____
   Transmission ____
   Coolant ____
6. Check air filter ____
7. Check PCV ____
8. Check for sufficient drive wheel tire tread ____
9. Set drive wheel tire pressure to 45 psi ____
10. Attach smog check compliance certificate and test results ____

COMMENTS: _____

_____

_____

_____

Technician's Name _____ Technician's Signature _____

Engine Parameter Data

Mo Day Yr

Vehicle No. | Year | Make | Model | Mileage

Eng. Displ. | Type | Vehicle Identification No.

Test #	Test	Computer Scanner - Make/Model		
*	1. Battery Voltage			___
*	2. Trouble Codes		___	___
	3. Prom I. D. No.		_____	
*	4. Closed/Open Loop - Rich/Lean Status		___	___
*	5. O_2 Voltage (Varies)		___	___
*	6. Air Cleaner Divert-Air Switch Solenoid		___	___
*	7. EGR Solenoid-Canister Purge Solenoid		___	___
	8. Park/Neutral Switch - A/C Clutch		___	___
*	9. RPM - Throttle Position Sensor		___	___
	10. Nose Switch - Wide Open Throttle		___	___
*	11. RPM - MPH		___	___
	12. RPM - Torque Conv. Clutch		___	___
	13. MPH - Torque Conv. Clutch		___	___
	14. 3rd Gear SW - 4th Gear SW		___	___
	15. Manifold Press. KPA - Volts		___	___
	16. Barometric Press. KPA - Volts		___	___
*	17. Coolant Temperature-Idle Air Position		___	___
	18. Knock retard-Throttle Body Backup		___	___
*	19. RPM - Mixture Control Dwell		___	___
	20. Ignition - Crank		___	___

21. Power Steering

22. Block Learn - Integrator

* 23. Turbo Boost - O_2 Cross Counts

24. Start-up Enrich - Blend Enrich

25. ALCL Vote - MC Sol. Dwell

26. O_2 Loop region - MC Sol. Dwell

27. Altitude SW - Temp. SW

28. Press. diagnostic State (Min-T)

* 29. Fan Sol. - Early Fuel Evaporation

30. Spark Advance Ref. - ISC Motor

31. E-Cell

32. Hi Batt - Lo Batt Status

33. Quasi Asynch - Asynch

34. Manifold Air Temp.- Fan

35. Air Flow - Filtered Load (LV8)

36. Prop. Step Taken

37. Clear Flood Mode

38. Selected Diagnostic State

39. O/D Disable - 4th Gear Delay

40. A/C Head Pressure

41. Inj. Pulse Width

42. Vacuum - Wastegate Bypass

43. Ignition Spark

44. Eng. Temp. Warm - Hot

45. EST

46. Rear Vac-Brk - A/C Freon Low

47. Diesel EGR Min. - Max. ____ ____

48. Exh. Press. Reg. ____

49. EGR Press. Desired - Actual ____ ____

* 50. Ignition Timing Spec.-Actual Measured ____ ____

* Items marked must be verified by conventional means, i.e., timing light, digital multimeter (10,000 ohm impedance), OEM procedure, etc., if computer scanner is not available.

COMMENTS: _____

_____

_____

_____

_____ _____

Technician's Name Technician's Signature