State of California
AIR RESOURCES BOARD

Resolution 85-27

April 25, 1985

Agenda Item No.: 85-5-1

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules, and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in Section 43000 of the Health and Safety Code, the Legislature has declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in the state and, in Sections 39002 and 39003 of the Health and Safety Code, has charged the Air Resources Board with the responsibility for systematically attacking the serious air pollution problem caused by motor vehicles;

WHEREAS, Sections 43013, 43101 and 43104 of the Health and Safety Code authorize the Board to adopt emissions standards and test procedures to control air pollution caused by motor vehicles;

WHEREAS, pursuant to Section 43204 of the Health and Safety Code, motor vehicles and motor vehicle engines must be warranted by their manufacturers to be designed, built and equipped to conform, at the time of sale, with applicable emission standards, and free from defects which cause such vehicles or engines to fail to conform with applicable regulations during their useful lives;

WHEREAS, Section 43100 authorizes the Board to certify new motor vehicles, and Section 43102 provides that no new motor vehicle shall be certified unless it meets the emission standards and test procedures adopted by the Board;

WHEREAS, the Board has adopted "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" (certification test procedures), incorporated by reference in Section 1960.1, Title 13, California Administrative Code;

WHEREAS, the certification test procedures currently permit maintenance of the exhaust gas oxygen sensor during certification testing, but no earlier than 30,000 miles, provided that where sensor maintenance is prescribed between 30,000 and 50,000 miles an audible or visible signal alerts the vehicle operator to the need for maintenance;

WHEREAS, the staff has proposed that the certification test procedures incorporated by Section 1960.1, Title 13, California Administrative Code, be amended to require that oxygen sensors be maintenance free for 50,000 miles, provided that maintenance may be performed between 30,000 and 50,000 miles, if the manufacturer provides free replacement of the oxygen sensor at the first

maintenance interval as determined during certification testing, equips the vehicle with a maintenance indicator, and provides warranty coverage for the oxygen sensor for five years or 50,000 miles, whichever first occurs;

WHEREAS, the staff has further proposed the adoption of Section 1968, Title 13, California Administrative Code, which would require that passenger cars, light-duty trucks and medium-duty motor vehicles equipped with three-way catalyst systems and feedback control be equipped with a means of informing vehicle owners of malfunctions of emission-related components, EGR valves and fuel metering devices, and an on-board means of identifying the likely area responsible for the malfunction, and has proposed that the certification test procedures incorporated by Section 1960.1(h), Title 13, California Administrative Code, be amended to specify that certification applications for vehicles subject to proposed Section 1968 must include a description of the proposed system;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code.

WHEREAS, the California Environmental Quality Act (CEQA) and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, the Board finds that:

The oxygen sensor is critical to the proper functioning of the emission control systems of vehicles equipped with three-way catalyst systems and feedback control;

Extending the minimum maintenance interval for oxygen sensors will result in a reduction of emissions of nitrogen oxides, carbon monoxide, and hydrocarbons;

A net savings for replacement costs of oxygen sensors over a vehicle's lifetime would result from extending the minimum maintenance interval for oxygen sensors as a result of less frequent sensor replacements;

Oxygen sensors not requiring maintenance for 50,000 miles are technologically feasible and already in use on the majority of passenger cars, light-duty trucks and medium duty vehicles;

WHEREAS, the Board further finds that:

In-use emission testing of consumer-owned passenger cars, light-duty trucks and medium-duty vehicles has shown emissions from these vehicles in actual use to exceed the certification standards during their useful lives as defined in Section 43204 of the Health and Safety Code, as well as after that period;

Malfunctions of emission-related components, EGR valves and fuel metering devices in vehicles equipped with three-way catalyst emission control systems and feedback control contribute significantly to the excess emissions found in these vehicles;

Emission-related malfunctions in these vehicles are often difficult to diagnose, and, as they frequently have no effect on driveability or fuel economy, often go undetected;

Requiring that vehicles equipped with three-way catalysts and feedback control be equipped with a means of informing vehicle operators of malfunctions of emissions-related components, EGR valves and fuel metering devices, and with an on-board self diagnostic system will ensure that vehicle operators are aware of the need for repairs, including warranty repairs, and promote proper maintenance, thereby contributing to reductions of excess emissions;

Installation of a malfunction and diagnostic system will facilitate the identification and proper repair of malfunctioning equipment under the biennial smog check program;

The proposed malfunction and diagnostic system will result in a substantial decrease of hydrocarbon, carbon monoxide, and nitrogen oxide emissions; and

The staff proposal is a necessary and technologically feasible means of implementing the Board's emission standards, is cost-effective and economically feasible, and provides adequate lead time for manufacturers to comply with its provisions; and

WHEREAS, the Board has determined, pursuant to the requirements of the California Environmental Quality Act, that this regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE BE IT RESOLVED that the Board hereby approves the amendments to Section 1960.1(h), Title 13, California Administrative Code, and the incorporated "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as set forth in Attachment A hereto, and the adoption of Section 1968, Title 13, California Administrative Code, as set forth in Attachment B hereto.

BE IT FURTHER RESOLVED THAT the Board directs the Executive Officer to adopt the amendments as set forth in Attachment A, and Section 1968, Title 13, California Administrative Code, as set forth in Attachment B, after making them available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board hereby determines that the amendments and adoption approved herein will not cause the California emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards, and will not cause the California requirements to be inconsistent with with Section 202(a) of the Clean Air Act, and raise no new issues affecting previous waiver determinations of the Administrator of the Environmental Protection Agency pursuant to Section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall forward the regulations to the Environmental Protection Agency with a request for a waiver or for confirmation that the amendments are within the scope of an existing waiver, as appropriate, pursuant to Section 209(b)(1) of the Clean Air Act.

I hereby certify that the above is a true and correct copy of Resolution 85-27, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ATTACHMENT A

Amend Section 1960.1(h), Title 13, California Administrative Code, to read as follows:

(h) The test procedures for determining compliance with these standards are set forth in "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," adopted by the ~~State Board~~ state board on November 23, 1976, as last amended ~~January 5, 1984~~ 1985.

NOTE: Authority cited: Sections 39600, ~~and~~ 39601, 43013, and 43104, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101, 43102, 43104, ~~and~~ 43106, and 43204, Health and Safety Code.

d. In paragraph 86.079-21 (Application for Certification), amend subparagraph (b)(5) to read:

(5) A statement of maintenance and procedures consistent with the restrictions imposed under subparagraph 86.078-25(a)(1), necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation in normal use conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

e. In paragraph 86.078-25 (Maintenance):

1. Amend subparagraph (a)(1) to read as follows:

(1) Scheduled maintenance on the engine, emission control system, and fuel system of durability vehicles shall, unless otherwise provided pursuant to paragraph (a)(5)(iii), be restricted as set forth in the following provisions.

(i) (A) for gasoline-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated:

(1) Drive belts on engine accessories (tension adjustment only); (30,000 miles).

(2) Valve lash (15,000 miles).

(3) Spark plugs (30,000 miles).

(4) Air filter (30,000 miles).

(5) Exhaust gas sensor (30,000 miles): Provided that, for 1987 and prior model years, an audible and/or visible signal approved by the Executive Officer alerts the vehicle operator to the need for sensor maintenance at the mileage point; and provided that, for 1988 and subsequent model year vehicles;

(a) the manufacturer shall equip the vehicle with a maintenance indicator consisting of a light or flag, which shall be preset to activate automatically by illuminating in the case of a light or by covering the odometer in the case of a flag the first time the minimum maintenance interval established during certification testing is reached and which shall remain activated until reset. After resetting, the maintenance indicator shall activate automatically when the minimum maintenance interval, when added to the vehicle mileage at the time of resetting, is

again reached and shall again remain activated until reset. When the maintenance indicator consists of a light, it shall also activate automatically in the engine-run key position before engine cranking to indicate that it is functioning. The maintenance indicator shall be located on the instrument panel and shall, when activated, display the words "oxygen sensor" or may display such other words determined by the Executive Officer to be likely to cause the vehicle owner to seek oxygen sensor replacement. The maintenance indicator shall be separate from the malfunction indicator light required by Section 1968, Title 13, California Administrative Code;

(b) the manufacturer shall provide free replacement of the oxygen sensor, including both parts and labor, and shall reset the maintenance indicator without any charge, the first time the maintenance interval established during certification testing is reached for vehicles certified with scheduled sensor maintenance before 50,000 miles. If the oxygen sensor is replaced pursuant to the warranty provisions of Section 2037, Title 13, California Administrative Code, before the first maintenance interval is reached, the manufacturer shall also replace the oxygen sensor and reset the maintenance indicator at the mileage point determined by adding the maintenance interval to the vehicle's mileage at the time of the warranty replacement. If the calculated mileage point for a second oxygen sensor replacement would exceed 50,000 miles, no free second replacement shall be required;

(c) The maintenance indicator shall be resettable. The maintenance instructions required by paragraph 3.f. of these procedures shall provide instructions for the resetting of the maintenance indicator, and shall specify that the maintenance indicator shall be reset each time the oxygen sensor is replaced; and

(d) Notwithstanding the provisions of Section 2037(c), Title 13, California Administrative Code, the oxygen sensor, including any replacement required pursuant to this section, shall be warranted for the useful life of the vehicle or engine. If such oxygen sensor fails during the useful life period, it shall be replaced by the manufacturer in accordance with Section 2037(d), Title 13, California Administrative Code.

(6) Choke (cleaning or lubrication only); (30,000 miles).

h. Certification, if granted, is effective only for the vehicle/engine family described in the original manufacturer's certification application. Modifications by a secondary manufacturer to vehicles/engines shall be deemed not to increase emissions above the standards under which those vehicles/engines were certified and to be within the original certification if such modifications do not: (1) increase vehicle weight more than 10 percent above the curb weight, increase frontal area more than 10 percent, or result in a combination increase of weight plus frontal area of more than 14 percent; or (2) include changes in axle ratio, tire size, or tire type resulting in changes in the drive train ratio of more than 5 percent; or (3) include any modification to the emission control system. No originally certified vehicle/engine which is modified by a secondary manufacturer in a manner described in items (1) through (3) of the preceding sentence may be sold to an ultimate purchaser, offered or delivered for sale to an ultimate purchaser, or registered in California unless the modified vehicle/engine is certified by the state board in accordance with applicable test procedures to meet emission standards for the model year for which the vehicle/engine was originally certified.

For the purposes of this subsection, "secondary manufacturer" means any person, other than the original manufacturer, who modifies a new motor vehicle prior to sale to the ultimate purchaser.

i. For all vehicles subject to the provisions of Section 1968, Title 13, California Administrative Code, the manufacturer shall submit with its application for certification a description of the malfunction and diagnostic system to be installed on the vehicles. The vehicles shall not be certified unless the Executive Officer finds that the malfunction and diagnostic system complies with the requirements of Section 1968, Title 13, California Administrative Code.

6. Optional 100,000 Mile Certification Procedure

The alternate emission standards shown in paragraph (4) preceding shall apply to any engine family which meets all of the following additional requirements:

a. Each exhaust emission durability data vehicle shall be driven, with all emission control systems installed and operating, for 100,000 miles or such lesser distance as the Executive Officer may agree to as meeting the objectives of this procedure. Emission tests performed on emission-data vehicles and durability-data vehicles (for determination of the deterioration factors) shall be non-regeneration emission tests for diesel-powered passenger cars, light-duty trucks and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems. Compliance with the emission standards shall be established as follows:

All references in these test procedures to "useful life", 5 years, and 50,000 miles shall mean "total life", 10 years, and 100,000 miles, respectively, except in subparagraph (ii).

b. Only the following scheduled maintenance shall be allowed under subparagraph 86.078-25(a)(1)(i).

25(a)(1)(i)(A) Option 1. For 1981 and later model gasoline or diesel-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated.

(1) Drive belt tension on engine accessories (30,000 miles).
(2) Valve lash (15,000 miles).
(3) Spark plugs (30,000 miles).
(4) Air filter (30,000 miles).
(5) Exhaust gas sensor (30,000 miles): Provided that, for 1987 and prior model years, an audible and/or visible signal approved by the Executive Officer alerts the vehicle operator to the need for sensor maintenance at the mileage point; and (a) the manufacturer shall equip the vehicle with a maintenance indicator consisting of a light or flag, which shall be preset to activate automatically by illuminating in the case of a light or by covering the odometer in the case of a flag the first time the minimum maintenance interval established during certification testing is reached and which shall remain activated until reset. After resetting, the maintenance indicator shall activate automatically when the minimum maintenance interval, when added to the vehicle mileage at the time of resetting, is again reached and shall again remain activated until reset. When the maintenance indicator consists of a light, it shall also activate automatically in the engine-run key position before engine cranking to indicate that it is functioning. The maintenance indicator shall be located on the instrument panel and shall, when activated, display the words "oxygen sensor" or may display such other words determined by the Executive Officer to be likely to cause the vehicle owner to seek oxygen sensor replacement. The maintenance indicator shall be separate from the malfunction indicator light required by Section 1968, Title 13, California Administrative Code;

(b) the manufacturer shall provide free replacement of the oxygen sensor, including both parts and labor, and shall reset the maintenance indicator without any charge, the first time the maintenance interval established during certification testing is reached for vehicles certified with scheduled sensor maintenance before 50,000 miles. If the oxygen sensor is replaced pursuant to the warranty provisions of Section 2037, Title 13, California Administrative Code, before the first maintenance interval is reached, the manufacturer shall also replace the oxygen sensor and reset the maintenance indicator at the mileage point determined by

adding the maintenance interval to the vehicle's mileage at the time of the warranty replacement. If the calculated mileage point for a second oxygen sensor replacement would exceed 50,000 miles, no free second replacement shall be required;

(c) The maintenance indicator shall be resettable. The maintenance instructions required by paragraph 3.f. of these procedures shall provide instructions for the resetting of the maintenance indicator, and shall specify that the maintenance indicator shall be reset each time the oxygen sensor is replaced; and

(d) Notwithstanding the provisions of Section 2037(c), Title 13, California Administrative Code, the oxygen sensor, including any replacement required pursuant to this section, shall be warranted for the useful life of the vehicle or engine. If such oxygen sensor fails during the useful life period, it shall be replaced by the manufacturer in accordance with Section 2037(d), Title 13, California Administrative Code.

(6) Choke, cleaning or lubrication only (30,000 miles).
(7) Idle speed (30,000 miles).
(8) Fuel Filter (30,000 miles).
(9) Injection timing (30,000 miles).

25(a)(1)(i)(B) Option 2. For 1981 and later model gasoline or diesel-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated:

(1) Drive belt tension on engine accessories (30,000 miles).
(2) Valve lash (15,000 miles).
(3) Spark plugs (30,000 miles).
(4) Air filter (30,000 miles).
(5) Fuel filter (30,000 miles).
(6) Idle speed (30,000 miles).
(7) Injection timing (30,000 miles).

c. In addition, adjustment of the engine idle speed (curb idle and fast idle), valve lash, and engine bolt torque may be performed once during the first 5000 miles of scheduled driving, provided the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

d. The manufacturer agrees to apply to vehicles certified under this paragraph the provision of Section 43204 of the California Health and Safety Code for a period of ten years or 100,000 miles, whichever first occurs.

ATTACHMENT B

Adopt Section 1968, Title 13, California Administrative Code, to read as follows:

1968. Malfunction and Diagnostic System for 1988 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles with Three-Way Catalyst Systems and Feedback Control.

(a) All 1988 and subsequent model year passenger cars, light-duty trucks, and medium-duty vehicles equipped with a three-way catalyst system and feedback control shall be equipped with a means of informing the vehicle operator of the malfunction of computer-sensed emission-related components, and of the on-board computer processor, and of the malfunction of the emission-related functioning of the fuel metering device ~~or~~ and EGR valve on vehicles so equipped, and which provides for on-board diagnosis of the likely area of the malfunction without the aid of any external device.
The system shall include a means of informing the vehicle operator, upon initiation of engine starting, that it is functioning properly.
No malfunction and diagnostic system shall be required for malfunctions which would significantly impair vehicle driveability or prevent engine starting.

(b) This section ~~may~~ shall be implemented as specified in this subsection or by any means determined by the executive officer to meet the requirements of this section:

The vehicles shall be equipped with a malfunction indicator light and an on-board self-diagnostic system. The on-board computer processor shall interrogate input parameters from computer-sensed emission-related components and shall also interrogate the functioning of the fuel metering device and of the EGR valve on

vehicles so equipped. Upon detection of a malfunction of any such component, device, or valve, the computer processor shall cause the malfunction indicator light to illuminate. An on-board computer processor malfunction shall also cause the malfunction indicator light to illuminate. In the case of any such component, device or valve whose malfunction would significantly impair vehicle driveability or prevent engine starting, no malfunction indication or diagnostic code shall be required. The indicator light shall also illuminate in the engine-run key position before engine cranking to indicate that the malfunction indicator light is functioning. The self-diagnostic system shall provide an on-board means of identifying, without the aid of any external device, the likely area responsible for the detected malfunction when the vehicle is serviced. The malfunction indicator light shall be located on the instrument panel and shall when illuminated, display the phrase "Check Engine" or "Service Engine Soon" or may display such other phrase determined by the executive officer to be likely to cause a vehicle owner to seek corrective action.

(c) For purposes of this section:

(1) A "computer-sensed emissions-related component of the three-way catalyst emission control system" means a component which provides emission control system input to ~~or receives output from~~ the on-board computer processor.

(2) "Malfunction" means the partial or total failure ~~or diminished response~~ of one or more computer-sensed emission-related components or the on-board computer processor, or of the emission-related functioning of a fuel

metering device or EGR valve to a degree which would likely cause the emissions of an average certification vehicle with the failure or diminished response failures, individually or in combination, to exceed the emissions standards applicable pursuant to Subchapter 1 (commencing with Section 1900), Chapter 3 of Title 13.

(d) The executive officer shall grant an extension for compliance with the requirements of this section with respect to a specific vehicle model or engine family if a manufacturer demonstrates that it cannot modify a present electronic control system by the 1988 model year because major design system changes not consistent with the manufacturer's projected changeover schedule would be needed to comply with the provisions of this regulation. The period of extension shall not exceed that necessary to enable modification of the electronic system in accordance with the manufacturer's projected changeover schedule or three years, whichever first occurs. Any manufacturer requesting an extension shall, no later than July 1, 1986, submit to the executive officer of the state board an application setting forth the required demonstration and specifying the period for which the extension is requested.

Note: Authority cited: Sections 39600, 39601, and 43013, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101, 43102, 43104, 43105, and 43204, Health and Safety Code.

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider Adoption of Regulations Requiring Malfunction and Diagnostic Systems and Amendments Extending the Maintenance Interval for Oxygen Sensors for 1988 and Subsequent Model Year Gasoline-Powered Vehicles

Agenda Item No.: 85-5-1

Public Hearing Date: April 25, 1985

Response Date: May 30, 1985

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

Certified: _____
Board Secretary

Date: 09-27-85

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : August 5, 1985

Subject : Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
85-6
85-27
85-30
85-63

FILED AND POSTED BY
OFFICE OF THE SECRETARY
AUG 05 1985
Resources Agency of California