MAIL-OUT MSCD 97-01

State of California
AIR RESOURCES BOARD

Notice of Public Availability of Modified Text

AMENDMENTS TO REGULATIONS REGARDING ON-BOARD DIAGNOSTIC SYSTEM REQUIREMENTS FOR 1994 AND LATER PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES AND ENGINES (OBD II)

Public Hearing Date: December 12, 1996
Public Availability Date: February 3, 1997
Deadline for Public Comment: February 18, 1997

At a public hearing held on December 12, 1996, the Air Resources Board (the "Board") considered amendments to California's On-Board Diagnostic II (OBD II) regulation (Section 1968.1, Title 13, California Code of Regulations ("CCR")). The amendments were proposed to address manufacturers' implementation concerns, clarify the regulations where necessary, and improve the effectiveness of the regulations for future model year vehicles.

The Board adopted Resolution 96-60 approving the proposed amendments with modifications. The modifications made by the Board prior to adopting the Resolution are summarized below:

Section (m)(5.1) was modified by the Board to extend the provision to waive specific monitoring requirements on vehicles certified to run on alternate fuels. With the modification, the provision expires after the 2004 model year instead of the 1998 model year.

For purposes of consistency, the staff has proposed amendments to the certification procedures for alternate fuel retrofit systems (sections 2030 and 2031, Title 13, CCR, and "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for Motor Vehicles Certified for 1994 and Subsequent Model Years and for All Model Year Motor Vehicle Retrofit Systems Certified for Emission Reduction Credit"). In accordance with the modification made by the Board regarding implementation of fully compliant OBD II systems on vehicles certified to run on alternate fuels, the proposal would provide retrofit system manufacturers with similar leniency through the 2004 model year.

Sections (m)(6.2) and (m)(6.3) were modified by the Board to extend the existing deficiency provisions in the regulation. Manufacturers will be allowed with Executive Officer approval to certify vehicles through the 2003 model year with two deficiencies without being subject to fines. Additionally, for 2004 and later model year vehicles, manufacturers will be allowed to certify vehicles with one deficiency without being subject to fines. The Board also extended the carry-over provisions to allow manufacturers a carry-over of two years for deficiencies (with a third year available if special circumstances merit additional lead time to correct the deficiency).

In addition to these modifications, the staff has proposed other minor modifications to the OBD II regulation to further address manufacturers' concerns and for clarity:

Sections (b)(1.2.2), (b)(3.3.2), (l)(1.0), and (l)(4.0) have been modified to clarify that small volume manufacturers are not required to meet the specified phase-in percentages; however, such manufacturers shall achieve full compliance by the last year of the phase-in.

Section (b)(3.2)(A) has been modified to remove the maximum limit of 1000 revolutions for evaluating whether catalyst damaging misfire levels are present. However, the use of any interval greater than 200 revolutions continues to be subject to Executive Officer approval.

Section (b)(3.4.1)(B) has been modified to indicate that when using fuel shutoff during the occurrence of catalyst damaging misfire, the malfunction indicator lamp (MIL) need not be illuminated until the second driving cycle as specified in Section (b)(3.4.1)(A).

Sections (b)(3.4.1)(A) and (b)(3.4.2)(A) have been modified to further clarify the conditions under which the MIL must be illuminated and a fault code stored in response to detected misfire.

Sections (b)(3.4.1)(A), (b)(3.4.2)(A), and (b)(3.4.2)(B) have also been modified to further clarify the conditions when a temporary fault code may be erased.

Section (e) has been modified to clarify an allowance for manufacturers to indicate system readiness before all monitors have been completed if the vehicle is operated at extreme conditions (e.g., cold ambient temperatures, high altitudes, etc.) over multiple driving cycles.

Section (h)(7) has been modified to limit the amount of misfire detection capability data that must be submitted at the time of certification. By deleting the phrase “etc.” at the end of this section, manufacturers would only be required to submit data for the following three misfire patterns: misfire across random cylinders, complete misfire in one cylinder, and complete misfire in paired cylinders.

Section (n)(21.0) has been modified to clarify that an equivalent phase-in shall include full compliance no later than one year after the final year of the required phase-in.

Resolution 96-60, the modified portions of Section 1968.1, Title 13, CCR, the modified text of Sections 2030 and 2031, Title 13, CCR, and the modified text of the incorporated certification test procedure are attached. Comments regarding the modifications must be submitted to the Board Secretary, Air Resources Board, P.O. Box 2815, Sacramento, California 95812, no later than February 18, 1997, for consideration by the Executive Officer. Questions regarding this mail-out may be directed to Allen Lyons, Manager, Advanced Engineering Section, at (818) 575-6833.

Sincerely,

Robert H. Cross, Chief
Mobile Source Control Division

Attachments

Attachment I

State of California
AIR RESOURCES BOARD

Resolution 96-60

December 12, 1996

Agenda Item No.: 96-10 -2

WHEREAS, sections 39002 and 39003 of the Health and Safety Code charge the Air Resources Board ("ARB" or "Board") with the responsibility for systematically attacking the serious air pollution problem caused by motor vehicles;

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Board to adopt standards, rules and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in sections 43000 and 43000.5 of the Health and Safety Code, the Legislature declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the state and that despite significant reductions in vehicle emissions in recent years, continued growth in population and vehicle miles traveled throughout California have the potential not only to prevent attainment of the state standards, but in some cases, to result in worsening of air quality;

WHEREAS, section 43004 provides that unless expressly exempted, the exhaust emissions for gasoline-powered motor vehicles shall apply to motor vehicles that have been modified or altered to use a fuel other than gasoline or diesel;

WHEREAS, section 43006 provides that the ARB may certify the fuel system of any motor vehicle powered by a fuel other than gasoline or diesel that meets the standards specified by section 43004 and adopt test procedures for such certification;

WHEREAS, section 43013 of the Health and Safety Code authorizes the Board to adopt motor vehicle emission standards and in-use performance standards that it finds to be necessary, cost-effective, and technologically feasible;

WHEREAS, section 43018 of the Health and Safety Code directs the Board to achieve the maximum degree of emissions reductions possible from vehicular and other mobile sources in order to accomplish the attainment of state standards at the earliest possible date;

WHEREAS, section 44036.2 of the Health and Safety Code directs the Board to require motor vehicle manufacturers to provide service information necessary to properly inspect, test and repair motor vehicles;

WHEREAS, sections 39515 and 39516 of the Health and Safety Code provide that the Board may delegate any duty to the Executive Officer which the Board deems appropriate and that any power, duty, purpose, function, or jurisdiction which the Board may lawfully delegate shall be conclusively presumed to have been delegated to the Executive Officer unless the Board has expressly reserved such authority onto itself;

WHEREAS, in July 1990, the Board adopted and the Office of Administrative Law subsequently approved regulations regarding "Malfunction and Diagnostic System Requirements--1994 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines," (OBD II), which are codified at Title 13, CCR, section 1968.1, and which set forth requirements for (1) monitoring catalyst efficiency, engine misfire, evaporative system integrity, secondary air injection, and chlorofluorocarbon (CFC) containment; (2) improving current monitoring of the fuel system, oxygen sensor, EGR system, and other emission-related components of the on-board diagnostic system; and (3) standardizing fault codes, diagnostic repair equipment, the vehicle connector used for attaching the repair equipment to the vehicle, and the protocol for downloading repair information in order to improve the effectiveness of emission control system repairs;

WHEREAS, the Board adopted amendments to the OBD II regulations in 1991, 1993, and 1994, which were approved by the Office of Administrative Law;

WHEREAS, the staff has now proposed adoption of additional amendments to Title 13, CCR, section 1968.1 that, among other things, provide manufacturers with additional flexibility in complying with the malfunction and diagnostic requirements of the regulations including misfire detection, catalyst monitoring, evaporative system monitoring, and tamper resistance, and would require manufacturers to implement monitoring systems to detect positive crankcase ventilation malfunctions and thermostat malfunctions;

WHEREAS, the staff has further proposed that Title 13, CCR, section 1968.1 be amended to require manufacturers to provide service information in a standardized electronic format, to require electronic access to on-board computer software identifiers, and to provide for verification of software integrity;

WHEREAS, the California Environmental Quality Act (CEQA), section 21080.5 of the Public Resources Code and Board regulations at Title 17, CCR, section 60006 require that no project which may have significant adverse environmental impacts may be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce or eliminate such impacts;

WHEREAS, pursuant to section 43013(e) of the Health and Safety Code and section 11346.3 of the Government Code, the Board has considered and assessed the effects of the proposed amendments to the regulations on the economy of the state;

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 Board finds that:

With the introduction of 1996 model year vehicles, manufacturers have incorporated OBD II systems into nearly all of their vehicle models, and indications are that the systems are largely functioning properly in detecting emission related malfunctions in-use;

The proposed amendments to Title 13, CCR, section 1968.1 would further help to ensure that all OBD II systems function properly in-use by providing for additional compliance flexibility, by clarifying certain requirements that have been perceived by industry as being ambiguous, and by making other minor changes to the requirements that specifically address the problem of premature or false malfunction indications while maintaining system effectiveness in detecting actual and repeatable malfunctions;

Positive crankcase ventilation system malfunctions can contribute significantly to excess in-use emissions by causing crankcase vapors to be vented directly to the atmosphere, and, therefore, monitoring for such malfunctions would result in significant in-use emission reductions;

Thermostat malfunctions can cause excess in-use emissions due to prolonged vehicle warm-up and disablement of existing OBD II monitoring strategies, and, therefore, monitoring would result in a significant in-use emission reduction and further ensure proper OBD II system performance;

Vehicle manufacturers have indicated that they will employ techniques on their own initiative to make on-board computers resistant to tampering and, as such, the specific requirements of Section 1968.1 (d), Title 13, CCR, for electronically reprogrammable computers are unnecessary and could be burdensome and restrictive.

Studies indicate that the majority of vehicle repairs are conducted by independent service facilities, particularly once vehicles are out of warranty; improved access to vehicle service and repair information by the independent service industry would provide more effective and efficient repair of emission-related malfunctions;

The proposed amendments to Title 13, CCR, section 1968.1 are necessary, cost-effective, and technologically feasible to carry out the purposes of the California Clean Air Act; and

The proposed amendments to Title 13, CCR, section 1968.1 do not affect the Board's earlier findings that the full implementation of the regulation will result in emission reductions that will help attain and maintain national and air quality standards for ozone, carbon monoxide and nitrogen dioxide;

The economic and cost impacts of the amendments to Title 13, CCR, section 1968.1 have been analyzed as required by California law, and the conclusions and supporting documentation for this analysis are set forth in the Initial Statement of Reasons for this regulatory action;

The reporting requirements of Title 13, CCR, section 1968.1 applicable to businesses are necessary for the health, safety, and welfare of the people of the State;

The requirements of Title 13, CCR, section 1968.1 establishing monitoring requirements for on-board computer monitoring systems and provisions for distribution of service information, address issues similar to those which are addressed in federal regulations; however, the provisions of Title 13, CCR, section 1968.1 differ from the federal regulations codified at 40 CFR Part 86, section 86.094-2 et seq.

The different state provisions are justified in that they are authorized by state law and the cost of the different state provisions is justified by the benefit to human health, public safety, public welfare, or the environment.

WHEREAS, with respect to the requirements of CEQA and Title 17, CCR, section 60006, the Board further finds:

Title 13, CCR, section 1968.1(b)(3.3) presently provides that phase-in of systems to detect misfire continuously and under all positive torque engine speeds and conditions be completed by the 2000 model year; however, staff has determined, and the Board finds, that some additional lead time and other minor adjustments to the requirements will provide manufacturers an opportunity to refine and produce more efficient and cost-effective monitoring systems;

Section 1968.1 (b)(1), Title 13, CCR, currently requires that phase-in of catalyst monitoring systems capable of detecting catalyst deterioration before hydrocarbon emissions marginally exceed the applicable standard be completed by the 2000 model year; however, the staff has determined, and the Board finds, that additional lead time and a

slight increase in the emission level at which a malfunction must be indicated will better ensure timely detection of catalyst malfunctions without significant risk of malfunction detection on vehicles still meeting applicable standards, and will be more cost-effective;

Although the additional lead time provided to manufacturers to fully phase-in monitoring strategies capable of detecting catalyst damage before emissions marginally exceed applicable standards and for the detection of misfire over the full range of operating may have some short-term adverse environmental impacts in relation to the regulations presently in effect, overriding considerations exist justifying the amendments;

Strict enforcement of the existing regulations could result in the implementation of monitoring strategies that in some instances may not be fully reliable and thus may, in and of themselves, have some adverse environmental consequences;

During the additional lead time period, the possible adverse impacts of the amendments identified above should be mitigated because vehicles not meeting the enhanced catalyst and misfire detection requirements would still be required to monitor for malfunctions, though not at the levels of the enhanced requirements;

The additional lead time would allow for development of more cost-effective and reliable systems, which will assure greater long-term emission reductions from both the enhanced catalyst and misfire monitoring requirements;

The amendments, in the aggregate, will assure greater total emission reductions than provided under the present regulation: the adoption of monitoring requirements for positive crankcase ventilation systems, engine coolant thermostats, and improved access to service information will provide for greater emission reductions than any anticipated loss in reductions from the amendments for catalyst and misfire detection requirements;

There are no other feasible mitigation measures that would reduce the potential environmental impacts while at the same time providing manufacturers with the time necessary to produce more efficient and cost effective monitoring systems.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the amendments to section 1968.1, Title 13, California Code of Regulations as set forth in Attachment A hereto, with the modifications described in Attachment B, also attached hereto, and as follows: amend section (m)(5.1) to provide for continued disablement of specific monitoring strategies through the 1994 model year for alternative-fueled vehicles and section (m)(6.0) et seq. to extend the use of deficiency allowances;

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt section 1968.1, Title 13, California Code of Regulations, after making the modified regulatory language and any additional supporting documents and information available for public comment for a

period of 15 days, provided that the Executive Officer shall consider such written comments regarding the modification and additional supporting documents and information as may be submitted during this period, shall make modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he or she determines that this is warranted;

BE IT FURTHER RESOLVED that the Board hereby determines that pursuant to section 209(b) of the Clean Air Act the amendments adopted herein will not cause California motor vehicle emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards or California requirements to be inconsistent with section 202(a) of the Clean Air Act, and does not raise any new issues;

BE IT FURTHER RESOLVED that the Executive Officer shall, upon adoption, forward the amended subsections to Title 13, CCR, section 1968.1 to the Administrator of the Environmental Protection Agency with a request that these amendments be found to be within the scope of the existing waiver that has been granted under section 209(b) of the Clean Air Act for Title 13, CCR, section 1968.1;

BE IT FURTHER RESOLVED that the Board directs the staff to continue to closely monitor vehicle manufacturers in complying with the requirements of section 1968.1, Title 13, CCR, and to report to the Board in 1998 if further amendments to the regulations are necessary for future model year vehicles.

I hereby certify that the above is a true and correct copy of Resolution 96-60, as adopted by the Air Resources Board.

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Pat Hutchens, Clerk of the Board

Attachment II

Modifications to Section 1968.1, Title 13, California Code of Regulations

These are amendments to section 1968.1, Title 13, CCR. Amendments adopted by the Board on December 12, 1996, are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions. Amendments noticed for comment between February 3, 1997, and February 18, 1997, are indicated by double underline for additions and ~~*italics with strikeout*~~ to indicate deletions.

1968.1 Malfunction and Diagnostic System Requirements--1994 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines

Section (b):

(1.2.2) TLEV applications shall employ an emission threshold malfunction criterion of 2.0 times the applicable FTP HC standard plus the emissions from a test run with a representative 4000 mile catalyst system (125 hours of operation for medium-duty vehicles with engines certified on an engine dynamometer). The emission threshold criterion for LEV and ULEV applications shall be 2.5 and 3.0 times the applicable FTP HC standard, respectively, plus the emission level with a representative 4000 mile catalyst system. Notwithstanding, beginning with the 1998 model year, manufacturers shall phase in an emission threshold of 1.~~6~~75 times the applicable FTP HC standard for all categories of low emission vehicles, which shall not include the emission level with a 4000 mile catalyst system. The phase in percentages (based on the manufacturer's projected sales volume for low emission vehicle applications) shall equal or exceed ~~3~~20 percent in the 1998 model year, ~~6~~40 percent in the 1999 model year, 60 percent in the 2000 model year, 80 percent in the 2001 model year, with 100 percent implementation for the 200~~0~~2 model year. Alternate phase-in schedules that provide for equivalent emission reduction and timeliness overall as defined in section (n)(21.0) shall be accepted. Small volume manufacturers shall not be required to meet the phase-in percentages; however, such manufacturers shall achieve 100 percent compliance by the 2002 model year. ~~ULEV applications shall comply with the 1.5 times the standard emission threshold, and shall be included in the phase-in percentages specified above; however, prior to the 1998 model year, the Executive Officer shall revise the emission threshold for such vehicles if the manufacturer submits data and/or an engineering evaluation which adequately demonstrate that substantial vehicle body and/or catalyst system modifications would be necessary for this threshold to be met.~~

Section (b):

(3.2) Malfunction Criteria: The manufacturer shall specify in the documentation provided for certification (see subsection (g) and (h) infra.) a percentage of misfires out of the total number of firing events necessary for determining a malfunction for each of the conditions listed below.

(A) The percent misfire evaluated in 200 revolution increments for each engine speed and load condition which would result in catalyst damage. Subject to Executive Officer approval, a longer interval ~~*(up to 1000 revolutions)*~~ may be employed (but only for determining, on a given driving cycle, the first misfire exceedance in section (3.4.1)(A) below) provided the manufacturer submits data and/or an engineering evaluation which adequately demonstrate that catalyst damage would not occur due to unacceptably high catalyst temperatures before the interval has elapsed. The manufacturer shall submit in the certification documentation catalyst temperature data versus percent misfire over the full range of engine speed and load conditions. The data shall be obtained from a representative cross section of a manufacturer's engine offerings from small to large displacements. Up to three such engine evaluations shall be documented per manufacturer, though a manufacturer may submit more data if desired. An engineering evaluation shall be provided for establishing malfunction criteria for the remainder of engine families in the manufacturer's product line. The Executive Officer shall waive the evaluation requirement each year if, in the judgment of the Executive Officer, technological changes do not affect the previously determined malfunction criteria;

Section (b):

(3.3.2) 1997 and Later Model Year Vehicles: Manufacturers shall phase in expanded misfire monitoring conditions beginning with the 1997 model year. The phase in percentages (based on the manufacturer's projected sales volume for all vehicles and engines) shall equal or exceed 50 percent in the 1997 through 1999 model years, 75 percent in the ~~1998~~ 2000 model year, 90 percent in the ~~1999~~ 2001 model year, with 100 percent implementation for the 2002~~0~~ model year. Alternate phase-in schedules that provide for equivalent emission reduction and timeliness overall shall be accepted. Small volume manufacturers shall not be required to meet the phase-in percentages; however, 100 percent implementation of these monitoring conditions shall be required beginning with the 2002~~0~~ model year. On vehicles meeting these phase-in percentages, except as provided for in section (3.3.3) below, monitoring for misfire shall be continuous from engine starting (see section (n)) and under all positive torque engine speeds and load conditions. Vehicles not meeting the monitoring conditions of this section shall meet the monitoring conditions specified in section (b)(3.3.1) above.

Section (b):

(3.4) MIL Illumination and Fault Code Storage:

(3.4.1) ~~Except as provided below, u~~ Upon detection of the level of misfire specified in subsection (3.2) (A), the following criteria shall apply for MIL illumination and fault code storage:

(A) A temporary fault code shall be stored and the MIL shall blink once per second

during actual misfire conditions no later than after the third exceedance of the specified misfire level when operating in the region bound by the maximum engine speed and load conditions encountered during the FTP cycle and no later than after the first exceedance of the specified misfire level when operating at any other engine speed and load condition during a single driving cycle. The MIL shall blink during every subsequent exceedance during the driving cycle but may remain extinguished when misfire is not present. If the level of misfire is exceeded again (a single exceedance) during the following driving cycle or the next driving cycle in which similar conditions are encountered (see section (3.4.3) ~~*any subsequent driving cycle*~~ or while a temporary fault code for the level of misfire specified in subsection (3.2)(B) is present, the MIL shall blink as specified above, a fault code shall be stored, and the MIL shall ~~and~~ remain continuously illuminated, even if the misfire ceases ~~otherwise.~~ unless similar conditions have been encountered without an ~~*indication*~~ exceedance of the specified misfire level, in which case the initial temporary code and stored conditions may be erased. Further, if similar driving conditions are not encountered during 80 driving cycles subsequent to the initial detection of a malfunction, the initial temporary code and stored conditions may be erased.

(B) Notwithstanding, ~~I~~in vehicles which provide fuel shutoff and default fuel control to prevent overfueling during misfire conditions, the MIL need not blink. ~~*and may i*~~Instead, the MIL may illuminate continuously in accordance with the requirements for continuous MIL illumination in section (3.4.1)(A) above upon detection of misfire provided that the fuel shutoff and default control shall be activated as soon as misfire is detected. Fuel shutoff and default fuel control may be deactivated only to permit fueling outside of the misfire range.

(3.4.2) Upon detection of the misfire level~~s~~ specified in subsection (3.2) (B) ~~or (C)~~, the following criteria shall apply for MIL illumination and fault code storage:

(A) A temporary fault code shall be stored no later than after the fourth exceedance of the specified misfire level during a single driving cycle and the MIL shall be illuminated and a fault code stored no later than the end of the following driving cycle or the next ~~the next~~ ~~*any subsequent*~~ driving cycle in which similar conditions are encountered (see section (3.4.3)) if the level of misfire is again exceeded four times ~~detected~~. If ~~misfire is not detected during the second driving cycle, the MIL shall be illuminated and a fault code stored no later than the next driving cycle in which misfire is detected, unless~~ driving conditions similar to those under which misfire was originally detected have been encountered ~~(see section (3.4.3))~~ without an ~~*indication*~~ exceedance of the specified misfire level, ~~in which case~~ the initial temporary code and stored conditions may be erased. Furthermore, if similar driving conditions are not

encountered during 80 driving cycles subsequent to the initial detection of a malfunction, the initial temporary code and stored conditions may be erased.

(B) Notwithstanding, a temporary fault code shall be stored no later than after the first exceedance of the specified misfire level during a single driving cycle if the exceedance occurs within the first 1000 revolutions from engine start (defined in section (n)(20.0)) during which misfire detection is active. The MIL shall be illuminated and a fault code stored no later than the end of any subsequent driving cycle if misfire is again detected in the first 1000 revolutions. If similar conditions are encountered during a subsequent driving cycle ~~*and misfire is not detected*~~ without an exceedance of the specified misfire level, the initial temporary code and stored conditions may be erased. Furthermore, if similar driving conditions are not encountered during 80 driving cycles subsequent to the initial detection of a malfunction, the initial temporary code and stored conditions may be erased.

(3.4.3) Upon detection of misfire, manufacturers shall store the engine speed, load, and warm-up status (i.e., cold or warmed-up) under which the first misfire event which resulted in the storage of a temporary fault code was detected. A driving cycle shall be considered to have similar conditions if the stored engine speed conditions are encountered within 375 rpm, load conditions within ~~10~~ 20 percent, and the same warm-up status is present. With Executive Officer approval, other strategies for determining if similar conditions have been encountered may be employed. Approval shall be based on comparable timeliness and reliability in detecting similar conditions.

Section (e):

(e) READINESS/FUNCTION CODE The on-board computer shall store a code upon first completing a full diagnostic check (i.e., the minimum number of checks necessary for MIL illumination) of all monitored components and systems (except as noted below) since the computer memory was last cleared (~~e.g.~~ i.e., through the use of a scan tool or battery disconnect). The code shall be stored in the format specified by SAE J1979 or SAE J1939, whichever applies. Both documents are incorporated by reference in sections (k)(2.0) and (k)(5.0). The diagnostic system check for comprehensive component monitoring and continuous monitoring of misfire and fuel system faults shall be considered complete for purposes of determining the readiness indication if malfunctions are not detected in these areas by the time all other diagnostic system checks are complete. Subject to Executive Officer approval, ~~I~~if monitoring is ~~*temporarily*~~ disabled for a multiple number of driving cycles due to the continued presence of extreme operating conditions (e.g., cold ambient temperatures, high altitudes, etc), readiness for the subject monitoring system may be set without monitoring having been completed ~~*under conditions which may lead to false codes for any system, that check shall not be considered in determining diagnostic system readiness*~~. Executive Officer approval shall be based on the conditions for monitoring system disablement, and the number of driving cycles specified without completion of

monitoring before readiness is indicated. For evaporative system monitoring, the readiness indication shall be set when a full diagnostic check has been completed with respect to the 0.040 inch orifice malfunction criteria if the monitoring conditions are constrained with respect to detection of a 0.020 inch leak (see sections (b)(4.2.2) and (4.3)).

Section (h):

(7) Data supporting the selected degree of misfire which can be tolerated without damaging the catalyst. For vehicles designed to meet the expanded misfire monitoring conditions (section (b)(3.3.2) or (b)(3.3.3)), representative data demonstrating the capability of the misfire monitoring system (i.e., probability of detection of misfire events) to detect misfire over the full engine speed and load operating range for selected misfire patterns (i.e., random cylinders, one cylinder out, paired cylinders out~~, *etc.*~~).

Section (l):

(l) SIGNAL ACCESS

(1.0) The following signals in addition to the required freeze frame information shall be made available on demand through the serial port on the standardized data link connector: calculated load value, diagnostic trouble codes, engine coolant temperature, fuel control system status (open loop, closed loop, other; if equipped with closed loop fuel control), fuel trim (if equipped), fuel pressure (if available), ignition timing advance (if equipped), intake air temperature (if equipped), manifold air pressure (if equipped), air flow rate from mass air flow meter (if equipped), engine RPM, throttle position sensor output value (if equipped), secondary air status (upstream, downstream, or atmosphere; if equipped), and vehicle speed (if equipped). The signals shall be provided in standard units based on the SAE specifications incorporated by reference in this regulation, and actual signals shall be clearly identified separately from default value or limp home signals. Additionally, beginning with a phase-in of 30 percent in the 2000 model year, 60 percent in the 2001 model year, and with full implementation by the 2002 model year, the software calibration identification number shall be made available through the serial port on the standardized data link connector. The phase-in percentages shall be based on the manufacturer's projected sales volume for all vehicles and engines. Small volume manufacturers shall not be required to meet the phase-in percentages; however, such manufacturers shall achieve 100 percent compliance by the 2002 model year. The software calibration identification number shall be provided in a standardized format. Alternate phase-in percentages that provide for equivalent timeliness overall in implementing these requirements shall be accepted.

Section (l):

(4.0) Beginning with a phase-in of 30 percent in the 2000 model year, 60 percent in the 2001

model year, and with full implementation by the 2002 model year, manufacturers shall provide for verification of the on-board computer software integrity in electronically reprogrammable control units through the standardized vehicle data connector in a standardized format to be adopted by SAE. The phase-in percentages shall be based on the manufacturer's projected sales volume for all vehicles and engines. Small volume manufacturers shall not be required to meet the phase-in percentages; however, such manufacturers shall achieve 100 percent compliance by the 2002 model year. Such verification shall be capable of being used to determine if the emission-related software and/or calibration data are valid and applicable for that vehicle. Alternate phase-in percentages that provide for equivalent timeliness overall in implementing these requirements shall be accepted.

Section (m):

(5.1) Vehicles and engines certified to run on alternate fuels shall meet these requirements by the 1996 model year. However, manufacturers may request the Executive Officer to waive specific monitoring requirements for which monitoring may not be reliable with respect to the use of alternate fuels until the ~~*1999*~~ 2005 model year.

Section (m):

(6.2) Beginning with the 1997 model year and through the 2003~~*0*~~ model year, the certification provisions set forth in section (m)(6.1) above shall continue to apply subject to the following limitations: 1) The specified fines shall apply to the ~~*second*~~ third and subsequently identified deficiencies, with the exception that fines shall apply to all monitoring system deficiencies wherein a required monitoring strategy is completely absent from the OBD system, and 2) Manufacturers may not carry over monitoring system deficiencies for more than two ~~*to future*~~ model years unless it can be adequately demonstrated that substantial vehicle hardware modifications and additional lead time beyond two years would be necessary to correct the deficiency, in which case the deficiency may be carried over for ~~*one*~~ three model years.

(6.3) Beginning with the 2004 model year, the certification provisions set forth in section (m)(6.1) and (m)(6.2) above shall continue to apply subject to the following limitations: 1) The specified fines shall apply to the second and subsequently identified deficiencies, and 2) Manufacturers may not carry over monitoring system deficiencies to future model years.

Section (n):

(21.0) An "Alternate or Equivalent Phase-in" is one that achieves equivalent emission reductions by the end of the last year of the scheduled phase-in. The emission reductions shall be calculated by multiplying the percent of vehicles (based on the manufacturer's projected sales volume of all vehicles and engines) meeting the new requirements per year by the number of years implemented prior to and including the

last year of the scheduled phase-in and then summing these yearly results to determine a cumulative total (e.g., a three year, 30/60/100 percent scheduled phase-in would be calculated as (30%*3 years) + (60%*2 years) + (100%*1 year) = 310). Manufacturers shall be allowed to include vehicles introduced before the first year of the scheduled phase-in (e.g., in the previous example, 10 percent introduced one year before the scheduled phase-in begins would be calculated as (10%*4 years) and added to the cumulative total). Any alternate phase-in which results in an equal or larger cumulative total by the end of the last year of the scheduled phase-in shall be considered acceptable by the Executive Officer; however, all vehicles shall comply with the respective requirements subject to the phase-in within one model year following the last year of the phase-in schedule.

Attachment III

Modifications to Sections 2030, 2031, and the incorporated certification procedures, "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for Motor Vehicles Certified for 1994 and Subsequent Model Years and for All Model Year Motor Vehicle Retrofit Systems Certified for Emission Reduction Credit."

Note: The proposed amendments are shown in <u>underline</u> to indicate additions to the sections and ~~strikeout~~ to indicate deletions.

Amend Title 13, California Code of Regulations, Sections 2030 and 2031, to read as follows:

Article 5. Approval of Systems Designed to Convert Motor Vehicles to Use Fuels Other Than the Original Certification Fuel or to Convert Motor Vehicles for Emission Reduction Credit

2030. Liquefied Petroleum Gas or Natural Gas Retrofit Systems.

a) Applicable Standards and Test Procedures.

The standards and test procedures for approval of systems designed to convert 1993 and earlier model year motor vehicles to use liquefied petroleum gas or natural gas fuels are contained in "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Liquefied Petroleum Gas or Natural Gas Fuels" adopted by the State Board on April 16, 1975, as amended November 21, 1995. The standards and test procedures for approval of systems designed to convert 1994 and subsequent model year motor vehicles to use liquefied petroleum gas or natural gas fuels are contained in "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for Motor Vehicles Certified for 1994 and Subsequent Model Years and for all Model Year Motor Vehicle Retrofit Systems Certified for Emission Reduction Credit," adopted by the State Board March 11, 1993, as amended ~~November 21, 1995~~_____ _____. At the option of the retrofit system manufacturer, the standards and test procedures for approval of systems designed to convert 1994 and subsequent model year vehicles to use liquefied petroleum gas or natural gas fuels may be used for approval of systems designed to convert 1993 and earlier model year motor vehicles to use liquefied petroleum gas or natural gas fuels in lieu of the "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Liquefied Petroleum Gas or Natural Gas Fuels."

b) Implementation Phase-ln Schedule.

Notwithstanding subsection (a), a retrofit system manufacturer may apply "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Liquefied Petroleum Gas or Natural Gas Fuels" to certify retrofit systems for 1994 and 1995 model-year vehicles in accordance with the following implementation phase-in schedule. Each manufacturer may certify a maximum of 85 percent of its total 1994 model-year engine family retrofit systems, 45 percent of its total 1995 model-year systems, and 45 percent of its total 1996 model-year systems, according to the requirements of these test procedures and "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Alcohol or Alcohol/Gasoline Fuels", adopted by the State Board on April 28, 1983, as amended November 21, 1995. The remaining percentage of each manufacturer's certified 1994, 1995, and 1996 model-year engine family retrofit systems and all of 1997 and subsequent model-year engine family retrofit systems shall be certified according to "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems For Motor Vehicles Certified For 1994 and Subsequent Model Years and for all Model Year Motor Vehicle

Retrofit Systems Certified for Emission Reduction Credit." The percentages shall be determined from the total number of retrofit systems certified and shall be met prior to the end of the next respective calendar year. "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Liquefied Petroleum Gas or Natural Gas Fuels" shall not be applied to certify a retrofit system for installation on a transitional low-emission vehicle ("TLEV)", low-emission vehicle ("LEV)", or ultra-low emission vehicle ("ULEV)" or to certify a retrofit system designed to convert a vehicle to TLEV, LEV, or ULEV emission standards (as defined in Section 1960.1, Title 13, California Code of Regulations), or to certify a retrofit system for emission reduction credits.

NOTE: Authority cited: Sections 39515, 39600, 39601 and 43006, Health and Safety Code. Reference: Sections 43000, 43004, 43006, 43008.6, 43013 and 43108, Health and Safety Code; and Sections 27156, 38391 and 38395, Vehicle Code.

2031. Alcohol or Alcohol/Gasoline Fuels Retrofit Systems.

a) Applicable Standards and Test Procedures.

The standards and test procedures for approval of systems designed to convert 1993 and earlier model year motor vehicles to use alcohol or alcohol/gasoline fuels in lieu of the original certification fuel system are contained in "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Alcohol or Alcohol/Gasoline Fuels," adopted by the State Board April 28, 1983, as amended November 21,1995. The standards and test procedures for approval of systems designed to convert 1994 and subsequent model year motor vehicles to use alcohol or alcohol/gasoline fuels are contained in "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for Motor Vehicles Certified for 1994 and Subsequent Model Years and for all Model Year Motor Vehicle Retrofit Systems Certified for Emission Reduction Credit," adopted by the State Board March 11, 1993, as amended ~~November 21, 1995~~_____ . At the option of the retrofit system manufacturer, the standards and test procedures for approval of systems designed to convert 1994 and subsequent model year motor vehicles to use alcohol or alcohol/gasoline fuels may be used for approval of systems designed to convert 1993 and earlier model year motor vehicles to use alcohol or alcohol/gasoline fuels in lieu of the "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Alcohol or Alcohol/Gasoline Fuels."

b) Implementation Phase-ln Schedule.

Notwithstanding subsection (a), a retrofit system manufacturer may apply "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Alcohol or Alcohol/Gasoline Fuels" to certify retrofit systems for 1994 and 1995 model-year vehicles in accordance with the following implementation phase-in schedule. Each manufacturer may certify a maximum of 85

percent of its total 1994 model-year engine family retrofit systems, 45 percent of its total 1995 model-year systems, and 45 percent of its total 1996 model-year systems, according to the requirements of these test procedures and the "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Liquefied Petroleum Gas or Natural Gas Fuels," adopted by the State Board on April 16, 1975, as amended November 21,1995. The remaining percentage of each manufacturer's certified 1994, 1995, and 1996 model-year engine family retrofit systems and all of 1997 and subsequent model-year engine family retrofit systems shall be certified according to "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems For Motor Vehicles Certified For 1994 and Subsequent Model Years and for all Model Year Motor Vehicle Retrofit Systems Certified for Emission Reduction Credit." The percentages shall be determined from the total number of retrofit systems certified and shall be met prior to the end of the next respective calendar year. "California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Alcohol or Alcohol/Gasoline Fuels" shall not be applied to certify a retrofit system or installation on a transitional low-emission vehicle ("TLEV"), low-emission vehicle ("LEV"), or ultra-low-emission vehicle ("ULEV") or to certify a retrofit system designed to convert a vehicle to TLEV, LEV, or ULEV emission standards (as defined in Section 1960.1, Title 13, California Code of Regulations), or to certify a retrofit system for emission reduction credits.

NOTE: Authority cited: Sections 39515, 39600, 39601 and 43006, Health and Safety Code. Reference: Sections 43000, 43004, 43006, 43008.6, 43013 and 43108, Health and Safety Code; and Sections 27156, 38391 and 38395, Vehicle Code.

Amend Section (3) of the "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for Motor Vehicles Certified for 1994 and Subsequent Model Years and for All Model Year Motor Vehicle Retrofit Systems Certified for Emission Reduction Credit" to read as follows:

3. GENERAL REQUIREMENTS

(a) Product Specifications:

In addition to all other standards or requirements imposed, the following general requirements shall apply to all alternative fuel or credit-generating conventional fuel retrofit systems to be certified for installation on California-certified gasoline or diesel-fueled motor vehicles:

(i) Alternative fuel retrofit systems for gaseous fuels shall be equipped with a lockoff valve, actuated by an electrical or vacuum signal, preventing delivery of fuel to the carburetor, or fuel injection system, while the engine is shut down.

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

(iii) If the vehicle to be retrofitted was certified with an on-board diagnostic (OBD) system pursuant to Section 1968 or 1968.1, Title 13, California Code of Regulations (CCR), the proper function of the on-board diagnostic system shall not be impaired as a result of the installation and operation of the alternative fuel or credit-generating conventional fuel retrofit system. This requirement may necessitate modification of the OBD system to prevent it from storing erroneous trouble codes (e.g., storing a code signifying faulty operation of the evaporative canister purge valve because the evaporative emission control system has been removed). All modifications to OBD components, programming or wiring, must be fully specified as parts of the retrofit system. If the retrofit system includes modifications to the OBD system, the applicant must submit an analysis showing that these modifications will not adversely affect OBD performance. Notwithstanding, for ~~1998~~2004 and previous model year vehicles, retrofit system manufacturers may request Executive Officer approval to disable specific on-board diagnostic monitoring strategies for which monitoring may not be reliable with respect to the use of alternative fuels (e.g., oxygen sensor response rate checks).

The manufacturer shall submit data and/or an engineering evaluation to justify the request.

(iv) With the exception of idle speed control and throttle position control, no component or calibration of the fuel system that could affect emission performance shall be adjustable by the system installer or the vehicle's user.