State of California
AIR RESOURCES BOARD

# STAFF REPORT: INITIAL STATEMENT OF REASONS FOR RULEMAKING

# PROPOSAL TO CONSIDER THE INCORPORATION OF FEDERAL EXHAUST EMISSION STANDARDS FOR HEAVY-DUTY GASOLINE ENGINES AND ADOPTION OF MINOR AMENDMENTS TO THE LOW-EMISSION VEHICLE REGULATIONS

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## TABLE OF CONTENTS

EXECUTIVE SUMMARY.....I

I. INTRODUCTION.....1

II. PROPOSED HEAVY-DUTY GASOLINE ENGINE AMENDMENTS.....1
A. Background.....1
B. Description of the Proposal.....2

III. PROPOSED AMENDMENTS TO LIGHT- AND MEDIUM-DUTY VEHICLES..4
A. Background.....4
B. Description of the Proposal.....5

IV. OTHER PROPOSED AMENDMENTS .....7

V. AIR QUALITY, ENVIRONMENTAL AND ECONOMIC IMPACTS.....8

VI. REGULATORY ALTERNATIVES.....11

VII. STAFF RECOMMENDATION.....11

REFERENCES ……12

APPENDICES ……13
A. Appendix A: Proposed Regulation Order ……..A-1
B. Appendix B: Description of Proposed Amendments ……B-1

AVAILABILITY OF INCORPORATED DOCUMENTS ON THE INTERNET – REQUEST FOR DOCUMENT FORM

# EXECUTIVE SUMMARY

In January 2001, the United States Environmental Protection Agency (U.S. EPA) adopted more stringent emission standards for heavy-duty gasoline engines. In this rulemaking, staff proposes to align California's exhaust emission standards for heavy-duty engines with the federal program to ensure that California continues to receive only the cleanest engines available. Staff is also proposing minor administrative amendments to facilitate implementation of the LEV II program for light- and medium-duty vehicles.

**Proposal for Heavy-Duty Gasoline Engines.** The standards being proposed for heavy-duty gasoline engines are intended to align California standards with the recently promulgated federal standards. California and federal standards are currently identical through 2007 (1.0 grams per brake horsepower-hour (g/bhp-hr) for non-methane hydrocarbons plus oxides of nitrogen (NMHC+NOx) and 37.1 g/bhp-hr for carbon monoxide (CO)). However, U.S. EPA has recently adopted even more stringent standards for heavy-duty gasoline engines (0.14 g/bhp-hr for NMHC, 0.20 g/bhp-hr for NOx, 14.4 g/bhp-hr for CO, and a new 0.01 g/bhp-hr standard for particulate matter (PM)) effective with the 2008 model year. Staff is proposing to harmonize with the 2008 model year standards for heavy-duty gasoline engines. The resulting standards for smog forming NMHC and NOx are roughly one third those currently applicable in California. This will allow manufacturers to make one engine that meets both California and federal standards. Staff is also proposing to allow manufacturers to participate in the federal averaging, banking, and trading programs.

**Proposal for Light- and Medium-Duty Vehicles.** The amendments currently being proposed for light- and medium-duty vehicles are primarily administrative changes, designed to clarify current regulatory language and to update current emission control label specifications. Other minor changes being proposed include: (1) a requirement that fuel-fired heaters used in conventional vehicles meet the same standards and operational requirements as those used in zero-emission vehicles (ZEVs); (2) a change to the maintenance schedule for high-cost emission-related parts; and (3) a change in the test cycle for providing emission credits to vehicles using direct ozone technology. These provisions are preventative measures to ensure that only the cleanest technologies will be used in California vehicles.

**Emission Impact.** The emission benefits from adoption of the federal heavy-duty gasoline standards will be approximately 3.6 tons per day of reactive organic gas (ROG) plus NOx and 10.3 tons per day of CO in the South Coast Air Basin in 2020. Staff does not anticipate any significant emission benefits from the portion of this proposal pertaining to light- and medium-duty vehicles.

## I. INTRODUCTION

The purpose of this rulemaking is threefold. First, staff is proposing that California's emission standards be amended to align them with the recently adopted more stringent federal heavy-duty Otto-cycle (gasoline) emission standards and to allow participation in the federal averaging, banking, and trading program. Second, staff is proposing a new emission standard for fuel-fired heaters used on non-ZEV applications. Finally, staff is proposing clarifying modifications and other non-substantive language that would update the second generation Low-Emission Vehicle (LEV II) regulations and heavy-duty Otto-cycle and heavy-duty diesel requirements.

The adoption of California's Low-Emission Vehicle (LEV II) program for light- and medium-duty vehicles in 1998 was a harbinger of additional regulatory activity and emission standards for motor vehicles at the federal level. Since then the U.S. Environmental Protection Agency (U.S. EPA) has adopted Tier 2 standards for light- and medium-duty vehicles, more stringent standards for heavy-duty diesel engines beginning in 2004 and 2007 and more stringent standards for heavy-duty Otto-cycle engines beginning with the 2008 model year. As manufacturers begin to implement these new standards nationwide, it has become apparent that some mid-course corrections are necessary both to clarify and update existing California regulatory language. The intent of the proposed amendments in this rulemaking, then, is to facilitate implementation of these new requirements for manufacturers and to align with the federal standards and requirements where appropriate.

## II. PROPOSED HEAVY-DUTY GASOLINE ENGINE AMENDMENTS

### A. Background.

Vehicles sold in California that have a gross vehicle weight (GVW) greater than 8,500 pounds currently fall into three categories:

- chassis-certified complete vehicles between 8,501 and 14,000 pounds GVW (medium-duty vehicles);
- engine-certified incomplete vehicles between 8,501 and 14,000 pounds GVW (medium-duty engines); and
- heavy-duty engines over 14,000 pounds GVW.

Complete medium-duty gasoline vehicles (sold fully assembled directly to the customer) must meet emission standards based on chassis dynamometer[1] testing as set forth in the LEV II regulations. Incomplete medium-duty gasoline vehicles (manufacturer sells a partially assembled engine and platform to a secondary coach builder before final

[1] A dynamometer is a stationary laboratory device used to simulate on-road driving. Chassis dynamometer testing relies on the vehicle tires to drive the dynamometer while engine dynamometer testing relies on the engine directly driving the dynamometer (i.e., minus the transmission, driveshaft, axles, or tires).

delivery to a customer) must be certified using an engine dynamometer to either the ultra-low-emission vehicle (ULEV) or the super-ultra-low-emission vehicle (SULEV) emission standards. All California-certified heavy-duty gasoline vehicles currently must be engine dynamometer-certified to another set of emission standards. Federal regulations treat all gasoline engines used in vehicles over 8,500 pounds GVW as one heavy-duty category that must meet the same federal emission standards using an engine dynamometer.

On January 18, 2001,[2] U.S. EPA published new emission standards for heavy-duty gasoline engines applicable in the 2008 model year. The new emission standards reduce emissions of non-methane hydrocarbons (NMHC), oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM). The U.S. EPA regulations also reduce evaporative emissions from heavy-duty gasoline vehicles and exhaust emissions from diesel engines, contain new on-board diagnostic (OBD II) requirements for vehicles up to 14,000 pounds GVW, and reduce the sulfur content of diesel fuel.

### B. Description of the Proposal.

Recognizing that California would benefit from adopting the new federal emission standards for heavy-duty gasoline engines, staff is currently proposing to harmonize California's heavy-duty gasoline engine regulations with the federal standards. These standards would apply to ULEV medium-duty engines and to heavy-duty engines.[3] These engines would also be required to meet a new formaldehyde standard that would align with the 2004 California urban bus standard. Certification data show formaldehyde emissions from heavy-duty Otto-cycle engines are already well below the proposed formaldehyde standard. As is allowed for light- and medium-duty vehicles, staff is also proposing that a manufacturer be allowed to submit a statement of compliance with the formaldehyde standard at the time of certification in lieu of testing.

In addition, staff is proposing optional standards for medium-duty SULEV engines. A manufacturer that elects to certify to this standard may generate extra credits that could give the manufacturer more flexibility in its implementation plan.

The vehicle categories affected by this proposal are described below:

| Weight Category lbs. | Type of vehicle | Compliance Test-type | Applicable Emission Standard | |
|---|---|---|---|---|
| | | | Current | Proposal |
| 8,500-14,000 MDV | Complete | Chassis | CA LEV II | No change |
| 8,500-14,000 MDV | Incomplete | Engine | CA MD Gasoline | EPA HD Gasoline |
| >14,000 HD Gasoline | All | Engine | CA HD Gasoline | EPA HD Gasoline |

[2] Federal Register (66 F.R. 5002, at 5165)

[3] Since California already has stringent exhaust emission standards for complete vehicles, they are not affected by this proposal. Also, California has already adopted the new standards for heavy-duty diesel engines (including the low sulfur fuel specifications) and has its own OBD II and evaporative emission requirements. Therefore, the only elements of this federal rulemaking that staff are proposing be adopted for California are the exhaust NMHC, NOx, CO, and PM standards for heavy-duty gasoline engines used in vehicles above 8,500 pounds GVW.

The following table sets forth the current and proposed (in ***bold italics***) standards.

**California Emission Standards for 2005 and Subsequent Model Heavy-Duty Otto-Cycle Engines**
(in g/bhp-hr)

| Model Year | Emission Category | NMHC + NOx | NMHC | NOx | CO | HCHO | PM |
|---|---|---|---|---|---|---|---|
| **Standards for Heavy-Duty Otto-Cycle Engines Used In Incomplete Medium-Duty Vehicles 8,501 to 14,000 pounds GVW** | | | | | | | |
| 2005 through 2007 | ULEV | 1.0 | n/a | n/a | 14.4 | 0.05 | n/a |
| | SULEV | 0.5 | n/a | n/a | 7.2 | 0.025 | n/a |
| ***2008 and subsequent*** | ***ULEV*** | n/a | ***0.14*** | ***0.20*** | ***14.4*** | ***0.01*** | ***0.01*** |
| | ***SULEV*** | n/a | ***0.07*** | ***0.10*** | ***7.2*** | ***0.005*** | ***0.005*** |
| **Standards for Heavy-Duty Otto-Cycle Engines Used In Heavy-Duty Vehicles Over 14,000 pounds GVW** | | | | | | | |
| 2005 through 2007 | n/a | 1.0 | n/a | n/a | 37.1 | 0.05 | n/a |
| ***2008 and subsequent*** | n/a | n/a | ***0.14*** | ***0.20*** | ***14.4*** | ***0.01*** | ***0.01*** |

Finally, staff is proposing to allow medium-duty engines and heavy-duty engines to participate in the federal averaging, banking, and trading (ABT) program. Previously these engines were not included in ABT because California's medium-duty engine standards were more stringent than their federal counterparts. Allowing participation in ABT could, therefore, potentially allow a manufacturer to delay implementation of cleaner standards for a vehicle or engine family. Alternatively, the LEV I and LEV II programs allowed for the separate accrual of vehicle equivalent credits ("VECs") or vehicle equivalent debits ("VEDs") for a manufacturer that either exceeded or failed to meet the California phase-in requirements for these medium-duty vehicles and engines for a given model year. Although there are separate phase-in requirements for medium-duty engines and chassis-certified vehicles, the accrued credits may be used for either category.

By aligning California's medium- and heavy-duty Otto-cycle engine standards with the federal standards, the California and federal exhaust emission standards and phase-in requirements for medium-duty engines would be the same (with the exception of an optional SULEV category for medium-duty engines) and it would no longer be necessary to maintain a separate credit program in California for engines[4]. Thus, staff is proposing to sunset the California medium-duty credit program for engines after the 2004 model year; beginning with the 2005 model year, staff is proposing that

[4] This proposal does not affect medium-duty chassis-certified vehicles, which will still participate in a California-only program.

all California medium- and heavy-duty engines would be eligible to participate in the federal ABT programs specific to their fuel and weight categories.

The federal ABT program is based on an average emission level (called the maximum family emission limit, or FEL) for a particular group of engines that may be used in lieu of meeting the actual emission standard. Thus, similar to the averaging program for light- and medium-duty vehicles, a manufacturer may certify engines both above and below the standard for a given model year as long as the FEL is equal to or below the applicable emission standards. The emission standards can also be met through averaging with other engine families or banking or trading from other sources to meet the standard. For example, a manufacturer may certify an engine family with an FEL of 0.8 g/bhp-hr to the 1.0 g/bhp-hr standards and earn credits. In California, staff is proposing that the maximum FEL that would be allowed for engines participating in the ABT program is 1.0 g/bhp-hr NMHC plus NOx for those engines certifying to the emission standards for 2005 and subsequent model years, and 1.5 g/bhp-hr NMHC plus NOx for engines certifying to the option 1 or option 2 federal NMHC plus NOx standards.[5] For 2008 and subsequent model years, the FEL in California would be the same as the federal FEL. The proposed regulatory language is contained in Appendix B of this staff report.

A complete description of the proposed regulatory modifications for heavy- and medium-duty Otto-cycle engines is contained in the Appendices to this Staff Report.

## III. PROPOSED AMENDMENTS TO LIGHT- AND MEDIUM-DUTY VEHICLES

### A. Background.

The Air Resources Board (ARB or Board) adopted the LEV II regulations following a November 1998 hearing. These regulations are a continuation of the Low-Emission Vehicle (LEV I) regulations, which were originally adopted in 1990 and were phased in through the 2003 model year. The LEV II regulations extend the scope of the LEV I regulations by increasing the stringency of the emission standards for all light- and medium-duty vehicles beginning with the 2004 model year, and making the expanded category of light-duty trucks (including almost all sport utility vehicles and minivans) subject to the same emission standards as passenger cars. There are several tiers of increasingly stringent LEV II emission standards to which a manufacturer may certify: low-emission vehicle (LEV); ultra-low-emission vehicle (ULEV); super-ultra low-emission vehicle (SULEV); partial zero-emission vehicle (PZEV); and zero-emission vehicle (ZEV). In conjunction with the tiers of more stringent emission standards, the LEV II regulations provide manufacturers flexibility for phasing in vehicles meeting the standards. A manufacturer is allowed to choose the standards to which each vehicle model is certified provided its overall fleet meets the specified phase-in requirements according to a fleet average non-methane organic gas (NMOG) requirement that is progressively lower with each model year from 2004 through 2010.

[5] In 2003 and 2004, a manufacturers can optionally certify to a 1.5 g/bhp-hr NMHC+NOx standard in lieu of the 2005 1.0 g/bhp-hr NMHC+NOx standard.

Subsequent to the adoption of the LEV II program, the U.S. EPA adopted its own version of California emission standards known as the Tier 2 regulations. In December 2000, the Board modified the LEV II program to take advantage of some elements of the recently adopted federal Tier 2 program to ensure that only the cleanest vehicle models will continue to be sold in California.

In November 2001, the Board adopted further modifications to the LEV II regulations. Changes included new emission standards (a particulate matter standard for gasoline vehicles and requiring bi-, flexible- and dual-fuel PZEVs to certify to the same emission standard on both fuels) along with some minor administrative modifications to facilitate the certification effort for manufacturers.

### B. Description of the Proposal.

In this rulemaking, staff is proposing a few minor substantive amendments to the LEV II regulations as well as many minor modifications intended to clarify existing language, update existing language and align with updated federal requirements. A complete description of the proposed amendments is contained in the Appendices to this staff report.

1. The proposed new emission standards and requirements include:

**(a) Fuel-fired heater emission standards and certification requirements.** The LEV II program currently requires that fuel-fired heaters used in ZEVs be certified to the ULEV passenger car standard and be designed not to operate above 40$^{o}$F ambient temperature. These requirements were adopted to ensure that equipping vehicles with fuel-fired heaters would not cause an increase in emissions during times when ozone levels are high. At the time these requirements were adopted, there was no indication that fuel-fired heaters would be used in vehicles other than ZEVs, so heater use in conventional vehicles was not addressed. With the implementation of the LEV II program, however, it has become increasingly likely that this could become a point of concern. While there are no conventional vehicles equipped with auxiliary fuel-fired heaters currently certified, one manufacturer has approached staff and has indicated their intent to equip their diesel trucks with fuel-fired heaters. This is because very efficient diesel engines may generate very little excess heat that can be used to warm the passenger compartment. If this occurs, a manufacturer may install an auxiliary fuel-fired heater in vehicles using these engines. Under current regulations, these heaters would not be subject to any emission requirements. Staff is, therefore, proposing that fuel-fired heaters used in conventional light- and medium-duty vehicles meet the same requirements as heaters used in ZEVs. This is a preventive measure to minimize the ozone impact due to use of auxiliary fuel-fired heaters.

**(b) Change in maintenance schedule for test vehicles.** To ensure that vehicle emission control systems are durable, ARB regulations establish permitted

emission-related scheduled maintenance intervals that manufacturers must follow when demonstrating durability during certification testing. This information is also provided to a vehicle owner as part of the vehicle maintenance instructions. Currently, manufacturers are allowed to replace (and advise vehicle owners to replace at the owner's expense) a number of emission control components (e.g., the catalytic converter) at 100,000 miles. This first maintenance interval corresponded to the 100,000-mile "full useful life" standards for passenger cars and light-duty trucks under the LEV I program. Under the LEV II program, however, these vehicles must now meet 120,000-mile "full useful life" standards. Staff is accordingly proposing that the first allowable scheduled maintenance interval be aligned with the 120,000-mile "full useful life" requirements of the LEV II program.

2. The proposed administrative amendments include:

(a) **Proposed Revisions to the California Label Specifications.** Staff is proposing two amendments to the California Label Specifications. First, staff is proposing that the requirement for machine-readable vehicle emission control information (VECI) bar code label be removed. The VECI label was originally intended to be used by inspection and maintenance stations to electronically register test results; however, the California Smog Check stations do not currently scan the VECI label making this requirement obsolete. Therefore, at the request of manufacturers, staff is proposing that this requirement be eliminated.

Second, staff is proposing that the California label requirements be restructured. In 1978, the ARB adopted underhood emission control tune-up label requirements for automobile and engine manufacturers to account for California's unique emission standards and certification requirements. However, in 1998 the U.S. EPA and the ARB adopted regulations that essentially harmonized the California and federal certification and emission control label requirements for manufacturers. In order to account for these harmonized regulations, staff is proposing amendments to the "California Motor Vehicle Emission Control and Smog Index Label Specifications" (hereinafter, Label Specifications) that would align the California certification and emission control label requirements with those of the U.S. EPA.

Previously, the California label specifications were contained in a separate document. However, alignment with the federal emission control label requirements will make a separate document unnecessary. Since the current California and federal emission control labeling requirements are so similar, staff is proposing that the operative language be removed from the Label Specifications and replaced by references in the various Standards and Test Procedures documents incorporating the pertinent Code of Federal Regulations (CFR) label provisions. For example, all of the heavy-duty tune-up label specifications previously contained in the Label Specifications would now be incorporated into the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," Part I.35. Parallel changes would be made for heavy-duty diesel engines and light- and medium-duty vehicles.

The smog index label requirements are not affected by the proposed amendments and would continue to be contained in a separate document.

(b) **Revision to Test Cycle for Direct Ozone Reduction Technologies**. The LEV II regulations allow a manufacturer to earn NMOG fleet average emission reduction credits by incorporating new technologies on the vehicle. In order to receive credit, a manufacturer must submit information describing the operation, durability and performance of the device including the ozone-reducing efficiency. The test cycle currently required for demonstrating ozone reducing efficiency is the Supplemental Federal Test Procedure. However, this cycle may not necessarily determine the efficiency of an ozone reducing technology device under real world conditions. Thus, staff is proposing to change to a test procedure that is more representative of real world operating conditions, the Unified Cycle Driving Schedule.

(c) **Clarification of regulatory language.** Staff is proposing a number of wording changes to the LEV II regulations to clarify the intent of the regulations. These do not change the substance of the regulations and a detailed description of the proposed amendments is contained in Appendix B to this staff report.

(d) **On-Board Diagnostics References.** All light- and medium-duty vehicles and engines sold in California are currently required to meet on-board diagnostic II (OBD II) requirements, which are contained in section 1968.1, title 13, CCR. In April 2002, the Board adopted two new sections to title 13, CCR – sections 1968.2 and 1968.5 – that also contain OBD II regulatory requirements. (As of this time, these newly adopted sections have not yet been approved by the Office of Administrative Law.)

Many of the Standards and Test Procedures documents used in the certification of light-, medium- and heavy-duty vehicles contain a number of references to the OBD II requirements "as required under section 1968.1, title 13, CCR." The newly adopted sections 1968.2 and 1968.5 will also apply to these vehicles. In order for these certification documents to refer to the newly adopted OBD II regulations, as well as any future OBD II regulations, all references to "section 1968.1, title 13, CCR" would be changed to "section 1968, et seq., title 13, CCR, as applicable." Appendix B details the affected documents.

## IV. OTHER PROPOSED AMENDMENTS

A. **Heavy-Duty Diesel Engines**. In this rulemaking, staff is not proposing any substantive modifications to the "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles." Rather, staff has prepared an updated version of the procedure that substantially reorganizes the format. This new document is entitled, "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel

Engines." A description of the proposed document is contained in Appendix B of this staff report.

B. **California Refueling Emission Requirements**. In its recent decision waiving preemption for the California on-board refueling vapor recovery (ORVR) regulatory requirements (67 Fed. Reg. 54180 (August 21, 2002)), U.S. EPA identified two elements that needed to be revised.

First, the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," and title 13, CCR, §1978 contain a statement that, "Gaseous fueled vehicles are exempt from meeting the California refueling standards." This did not effectuate staff's intent that gaseous fueled vehicles would be subject to the federal requirements instead. U.S. EPA has ORVR requirements for vehicles fueled with two gaseous fuels – liquefied petroleum gas (LPG) and natural gas. It makes most sense for the California regulations to specify requirements for these gaseous-fueled vehicles identical to the federal requirements, and incorporate the federal testing requirements. This is how vehicles fueled with gasoline or diesel fuel are treated. Accordingly, the proposed amendments specify the federal ORVR emission standard for LPG-fueled vehicles. There is no federal emission standard for natural gas-fueled vehicles, only specifications for the refueling receptacle. These specifications would be included in the California ORVR requirements.

Second, during adoption of the LEV II requirements, staff updated the ORVR test procedures with a new format. The new format incorporated the LDV/MDV TPs for general certification purposes; however, the amendments had the unintended effect of removing the requirement that only gasoline meeting the federal certification fuel specifications may be used in ORVR certification testing. The proposed amendments would reinstate that requirement.

## V. AIR QUALITY, ENVIRONMENTAL AND ECONOMIC IMPACTS

### A. Air Quality and Environmental Impacts

The emission benefits realized by alignment with federal heavy-duty Otto-cycle engine standards will be approximately 3.6 tons per day of reactive organic gas (ROG) plus NOx and 10.3 tons per day of CO in the South Coast Air Basin in 2020. The new PM and formaldehyde standards being proposed for heavy-duty Otto-cycle engines are intended to be a safeguard to ensure that emissions from future engines do not increase to unhealthful levels, rather than to reduce current emission levels. Allowing medium-duty engines to participate in the federal ABT program will likely encourage earlier introduction of cleaner engines into California than required, and therefore, may provide a small emission benefit.

Staff anticipates that there will be limited emission impacts from the proposal for light- and medium-duty vehicles because it consists primarily of administrative changes. The new requirements for fuel-fired heaters and modifications

to the allowable maintenance schedule for test vehicles are meant to be protective measures to ensure that emissions do not increase. They also are not expected to significantly affect emissions.

Staff has not identified any significant adverse environmental impacts that would result from the proposal.

## B. Economic Impact

The staff expects that the proposed amendments will not have a significant cost impact on directly affected persons or businesses. No noticeable impact in California employment, business status, and/or competitiveness will occur.

**1. Legal requirements.** Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment includes a consideration of the impact of the proposed regulation on California jobs, business expansion, elimination, or creation, and the ability of California business to compete.

State agencies are required to estimate the cost or savings to any state or local agency, and to school districts. The estimate is to include any nondiscretionary cost or savings to local agencies and the cost or savings in federal funding to the state.

**2. Affected businesses.** Any business involved in manufacturing or purchasing passenger cars, light-duty trucks, medium-duty vehicles or heavy-duty gasoline engines or vehicles could be affected by the proposed amendments. There are approximately 34 companies worldwide that manufacture California-certified light- and medium-duty vehicles and heavy-duty gasoline engines. Only one motor vehicle manufacturing plant is located in California, the NUMMI facility, which is a joint venture between General Motors and Toyota.

**3. Potential impact on manufacturers and consumers.** The proposed heavy-duty Otto-cycle standards are not expected to have significant economic impacts on engine manufacturers or purchasers of heavy-duty Otto-cycle vehicles. US. EPA estimated that the new federal standards will result in an incremental system cost of less than $198 in the near term and $167 in the long term. Since a manufacturer will already have to incur these costs for engines sold throughout the rest of the United States, and since significant costs would be incurred in certifying federal and California engines to different standards, adoption of the standards for California should not result in increased costs for manufacturers. The proposed standard for formaldehyde is already being met by current California-certified heavy-duty engines. Furthermore, a manufacturer will be allowed to demonstrate compliance with the formaldehyde standard by providing a statement in its application for certification that its Otto-cycle engines will comply with the applicable standard in lieu of testing the engines; this requirement is consistent with the federal certification requirement. Finally, allowing medium-duty gasoline engines to participate in the

federal ABT program will provide a cost savings to manufacturers since this program will give them more flexibility in complying with California's emission requirements. The impact on consumers is also expected to be minimal.

The proposed requirements for light- and medium-duty vehicles are not expected to impact automobile manufacturers significantly, since the proposed regulatory and test procedure changes are primarily administrative. The new requirements for fuel-fired heaters used in conventional vehicles are identical to those applicable to fuel-fired heaters used in ZEVs, so it is expected that such heaters will have been designed to meet the ULEV standard. Revising the first allowable scheduled maintenance interval (increasing it from 100,000 miles to 120,000 miles) for LEV II vehicles is not expected to increase costs significantly. Since LEV II vehicles are required to certify to 120,000-mile standards, manufacturers must already design emission control components to last 120,000 miles. Manufacturers have understood since 1999 that the efficiency of direct ozone reduction technologies would have to be demonstrated using the Unified Cycle (test cycle), and a change in the test cycle should not increase manufacturer costs. Finally, removing the requirement for the VECI bar code label should result in a minor cost savings to the manufacturer.

**4. Potential impact on business competitiveness.** The proposed amendments would have no adverse impacts on the ability of California businesses to compete with businesses in other states because staff is not proposing any changes for light- or medium-duty vehicles that are expected to increase vehicle cost or limit vehicle availability. The proposed medium- and heavy-duty gasoline engine regulatory amendments would have no adverse impacts on the ability of California businesses to compete with businesses in other states because the proposal primarily harmonizes California standards with the federal standards for heavy-duty gasoline engines. Therefore, the engines sold in California will be able to be sold nationwide.

**5. Potential impact on employment.** The proposed amendments are not expected to cause a noticeable change in California employment because all but a very small portion of automobile manufacturing is conducted in other states and all heavy-duty Otto-cycle engine manufacturing is conducted in other states. The amendments are also not expected to significantly increase the cost of California motor vehicles or motor vehicle engines.

**6. Potential impact on business creation, elimination, or expansion.** The proposed amendments are not expected to affect business creation, elimination, or expansion.

**7. Potential costs to local and state agencies.** The proposed amendments are not expected to have a fiscal impact on state and local agencies or on funding to state agencies.

## VI. REGULATORY ALTERNATIVES

Staff considered the following regulatory alternative to the proposed amendments.

**Do not amend California's current regulations.** The recently promulgated federal standards for heavy-duty gasoline engines present California with a cost-effective way to reduce emission from heavy-duty gasoline vehicles. We would be losing emission benefits by not aligning California's standards with the more stringent federal standards. The proposed changes for light- and medium-duty vehicles and medium-duty gasoline engines are primarily administrative and are needed to clarify the intent of the regulations. The remaining changes to the LEV II program (affecting fuel-fired heaters, allowable maintenance schedule, and the test cycle for direct ozone reduction technologies) are needed to ensure that California continues to receive the cleanest vehicles manufactured.

No alternative considered by the agency would be more effective in carrying out the purpose for which the regulation is proposed or would be as effective or less burdensome to affected private persons than the proposed regulation.

## VII. STAFF RECOMMENDATION

For the reasons stated above, staff recommends that the Board adopt the proposal set forth in this staff report.

Attachments

## REFERENCES


1. Staff Report: Initial Statement of Reasons, “Proposed Amendments to California Exhaust and Evaporative Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles “LEV II” and Proposed Amendments to California Motor Vehicle Certification, Assembly Line and In-Use Test Requirements “CAP 2000”,” California Air Resources Board, September 18, 1998.

2. “Manufacturers Advisory Correspondence MAC No. 99-06,” Subject: Certification of Direct Ozone Reduction Technologies, California Air Resources Board.

3. Preamble and Final Rule “Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements; Final Rule,” Federal Register, Volume 66, Number 12, Thursday, January 18, 2001, pages 5001-5134.

4. American National Standards Institute/ American Gas Association Standard for Compressed Natural Gas Vehicle Fueling Connection Devices, ANSI/AGA NGV1 standard-1994.

# APPENDIX A

# PROPOSED REGULATION ORDER

## APPENDIX A

## PROPOSED REGULATION ORDER

### Amendments to Sections 1956.1, 1956.8, 1961, 1965, and 1978, Title 13, California Code of Regulations

Set forth below are the proposed amendments to title 13 of the California Code of Regulations. Proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions. Previously-proposed amendments in the transit bus rulemaking to be considered by the Board at an October 24, 2002 hearing are separately shown in dotted underline and ***~~bold italic strikeout~~*** to indicate additions and deletions, respectively.

### § 1956.1. Exhaust Emission Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Urban Bus Engines and Vehicles.

(a) [No change.]

(b) The test procedures for determining compliance with standards applicable to 1985 and subsequent model heavy-duty diesel cycle urban bus engines and vehicles and the requirements for participating in the averaging, banking and trading programs, are set forth in the "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles, " adopted April 8, 1985, as last amended ~~December 8, 2000~~ [insert last amended date], "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines," adopted [insert date of adoption], and the "California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes," adopted [insert adopted date], which ***~~is~~*** are incorporated by reference herein.

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43100, 43101, 43104, and 43806, Health and Safety Code and section 28114 Vehicle Code. Reference: Sections 39002, 39003, 39017, 39033, 39500, 39650, 39657, 39667, 39701, 40000, 43000, 43000.5, 43009, 43013, 43018, 43102, 43806, Health and Safety Code, and section 28114 Vehicle Code.

**§ 1956.8. Exhaust Emission Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles.**

(a) [No change.]

(b) The test procedures for determining compliance with standards applicable to 1985 and subsequent model heavy-duty diesel engines and vehicles and the requirements for participating in the averaging, banking and trading programs, are set forth in the "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles, " adopted April 8, 1985, as last amended ~~December 8, 2000~~ [insert last amended date], the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines," adopted [insert date of adoption], and the "California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes," adopted [insert adopted date], which ~~*is*~~ are incorporated by reference herein.

(c)(1)(A) [No change.]

(B) The exhaust emissions from new 2005 and subsequent model heavy-duty Otto-cycle engines, except for Otto-cycle medium- and heavy-duty engines subject to the alternative standards in 40 CFR §86,005-10(f), shall not exceed:

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**California Emission Standards for 2005 and Subsequent Model Heavy-Duty Otto-Cycle Engines[A]**

(in g/bhp-hr)

| Model Year | Emission Category | NMHC + NOx | NMHC | NOx | CO[F] | HCHO | PM |
|---|---|---|---|---|---|---|---|
| **Standards for Heavy-Duty Otto-Cycle Engines Used In Incomplete Medium-Duty Vehicles 8,501 to 14,000 pounds GVW[B]** | | | | | | | |
| 2005 through 2007 | ULEV | 1.0[C,E] | n/a | n/a | 14.4 | 0.05 | n/a |
| | SULEV | 0.5 | n/a | n/a | 7.2 | 0.025 | n/a |
| 2008 and subsequent | ULEV | n/a | 0.14[E] | 0.20[E] | 14.4 | 0.01 | 0.01 |
| | SULEV | n/a | 0.07[E] | 0.10[E] | 7.2 | 0.005 | 0.005 |
| **Standards for Heavy-Duty Otto-Cycle Engines Used In Heavy-Duty Vehicles Over 14,000 pounds GVW** | | | | | | | |
| 2005 through 2007 | n/a | 1.0[C,E] | n/a | n/a | 37.1 | 0.05[D] | n/a |
| 2008 and subsequent | n/a | n/a | 0.14[E] | 0.20[E] | 14.4 | 0.01 | 0.01 |

A These standards apply to petroleum-fueled, alcohol-fueled, liquefied petroleum gas-fueled and natural gas-fueled Otto-cycle engines.

B. A manufacturer of engines used in incomplete medium-duty vehicles may choose to comply with these standards as an alternative to the primary emission standards and test procedures for complete vehicles specified in section 1961, title 13, CCR. A manufacturer that chooses to comply with these optional heavy-duty engine standards and test procedures shall specify, in the Part I application for certification, an in-use compliance test procedure, as provided in section 2139(c), title 13 CCR.

C A manufacturer may request to certify to the Option 1 or Option 2 federal NMHC + NOx standards as set forth in 40 CFR § 86.005-10(f), ~~adopted October 6, 2000~~. However, for engines used in medium-duty vehicles ~~8,501 - 14,000 lbs. GVWR~~, the formaldehyde ~~and carbon monoxide~~ level ~~standards~~ must meet the standard ~~levels~~ specified above.

D This standard only applies to methanol-fueled Otto-cycle engines.

E A manufacturer may elect to include any or all of its medium- and heavy-duty Otto-cycle engine families in any or all of the emissions ABT programs for HDEs, within the restrictions described in section I.15 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," incorporated by reference in section 1956.8(d). For engine families certified to the Option 1 or 2 federal standards the FEL must not exceed 1.5 g/bhp-hr. If a manufacturer elects to include engine families certified to the 2005 and subsequent model year standards, the NOx plus NMHC FEL must not exceed 1.0 g/bhp-hr. For engine families certified to the 2008 and subsequent model year standards, the FEL is the same as set forth in 40 CFR 86.008-10(a)(1).

F Idle carbon monoxide: For all Otto-cycle heavy-duty engines utilizing aftertreatment technology, and not certified to the on-board diagnostics requirements of section 1968, et seq, as applicable, the CO emissions shall not exceed 0.50 percent of exhaust gas flow at curb idle.

| ~~*Model Year*~~ | ~~*Emission Category*~~ | ~~*NMHC + NOx*~~ | ~~*CO*~~ | ~~*CHO*~~ | ~~*H*~~ |
|---|---|---|---|---|---|
| ~~***Standards for Heavy-Duty Otto-Cycle Engines Used In Incomplete Medium-Duty Vehicles 8,501 to 14,000 pounds GVW[B]***~~ | | | | | |
| ~~2005 and subsequent~~ | ~~ULEV~~ | ~~1.0[C]~~ | ~~4.4~~ | ~~.05~~ | ~~0~~ |
| | ~~SULEV~~ | ~~0.5~~ | ~~.2~~ | ~~.025~~ | ~~0~~ |
| ~~Standards for Heavy-Duty Otto-Cycle Engines Used In *Heavy-Duty Vehicles Over 14,000 pounds GVW*~~ | | | | | |
| ~~2005 and subsequent~~ | ~~n/a~~ | ~~1.0[C]~~ | ~~7.1~~ | ~~.05[D]~~ | ~~0~~ |

(c)(2) [No change.]

(d) The test procedures for determining compliance with standards applicable to 1987 and subsequent model heavy-duty Otto-cycle engines and vehicles are set forth in

the “California Exhaust Emission Standards and Test Procedures for 1987 through 2003 Model Heavy-Duty Otto-Cycle Engines and Vehicles,” adopted April 25, 1986, as last amended December 27, 2000, ~~and~~ the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines,” adopted December 27, 2000, as last amended [INSERT DATE OF AMENDMENT], the “California Non-Methane Organic Gas Test Procedures,” adopted July 12, 1991, as last amended July 30, 2002, and the “California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes,” adopted [insert adopted date], which are incorporated by reference herein.

Subsections (e) through (h). [No change.]

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104, and 43806, Health and Safety Code, and Vehicle Code section 28114. Reference: Sections 39002, 39003, 43000, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43106, 43204, and 43806, Health and Safety Code.

**§ 1961. Exhaust Emission Standards and Test Procedures - 2004 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.**

*Introduction.* This section 1961 contains the California "LEV II" exhaust emission standards for 2004 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles. A manufacturer must demonstrate compliance with the exhaust standards in section 1961(a) applicable to specific test groups, and with the composite phase-in requirements in section 1961(b) applicable to the manufacturer's entire fleet. Section 1961(b) also includes the manufacturer's fleet-wide composite phase-in requirements for the 2001 - 2003 model years.

Prior to the 2004 model year, a manufacturer that produces vehicles that meet the standards in section 1961(a) has the option of certifying the vehicles to those standards, in which case the vehicles will be treated as LEV II vehicles for purposes of the fleet-wide phase-in requirements. Similarly, 2004 - 2006 model-year vehicles may be certified to the "LEV I" exhaust emission standards in section 1960.1(g)(1) and (h)(2), in which case the vehicles will be treated as LEV I vehicles for purposes of the fleet-wide phase-in requirements.

A manufacturer has the option of certifying engines used in incomplete and diesel medium-duty vehicles with a gross vehicle weight rating of greater than 8,500 lbs. to the heavy-duty engine standards and test procedures set forth in title 13, CCR, sections 1956.8(c), (g) and (h).

(a) *Exhaust Emission Standards*.

Subsection (a)(1) through (7). [No change.]

(8) *Requirements for Vehicles Certified to the Optional 150,000 Mile Standards.*

(A) *Requirement to Generate Additional Fleet Average NMOG Credit*.

[No change.]

(B) *Requirement to Generate a Partial ZEV Allowance.* A vehicle that is certified to the 150,000 mile SULEV standards shall also generate a partial ZEV allocation according to the criteria set forth in section C.3 of the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962~~(h)~~."

Subsections (9) through (11). [No change.]

(12) *NMOG Credit for Direct Ozone Reduction Technology*. A manufacturer that certifies vehicles equipped with direct ozone reduction technologies shall be eligible to receive NMOG credits that can be applied to the NMOG exhaust emissions of the vehicle when determining compliance with the standard. In order to receive credit, the manufacturer must submit the following information for each vehicle model, including, but not limited to:

(A) a demonstration of the airflow rate through the direct ozone reduction device and the ozone-reducing efficiency of the device over the range of speeds encountered in the ~~SFTP test cycle~~ Unified Cycle Driving Schedule.

(B) an evaluation of the durability of the device for the full useful life of the vehicle; and

(C) a description of the on-board diagnostic strategy for monitoring the performance of the device in-use.

Using the above information, the Executive Officer shall determine the value of the NMOG credit based on the calculated change in the one-hour peak ozone level using an approved airshed model.

Subsections (13) and (14). [No change.]

(15) *Emission Standard for a Fuel-Fired Heater.* Whenever a manufacturer elects to utilize an onboard fuel-fired heater on any passenger car, light-duty truck or medium-duty vehicle, the fuel-fired heater must meet LEV II ULEV standards for passenger cars and light-duty trucks less than 8,500 pounds GVW as set forth in section 1961(a)(1).

(b) *Emission Standards Phase-In Requirements for Manufacturers*.

Subsections (b)(1) through (b)(2). [No change.]

(3) *Medium-Duty Vehicle Phase-In Requirements*.

(A) [No change.]

(B) *Phase-In Requirements for LEV II MDVs*. For the 2004 through 2006 model years, a manufacturer, other than a small volume manufacturer must phase-in at least one test group per model year to the MDV LEV II standards. All 2007 and subsequent model year MDVs, including those produced by a small volume manufacturer, are subject to the LEV II MDV standards. Beginning in the 2005 model year, all medium-duty engines certified to the optional medium-duty engine standards in title 13, CCR §1956.8(c) or (h), including those produced by a small volume manufacturer, must meet the standards set forth in title 13, CCR §1956.8(c) or (h), as applicable. A manufacturer that elects to certify to the Option 1 or Option 2 federal standards as set forth in 40 CFR §86.005-10(f) is not subject to these phase-in requirements.

(C) *Identifying a Manufacturer's MDV Fleet*. For the 2001 and subsequent model years, each manufacturer's MDV fleet shall be defined as the total number of California-certified MDVs produced and delivered for sale in California. The percentages shall be applied to the manufacturers' total production of California-certified medium-duty vehicles delivered for sale in California. For the 2005 and subsequent model years, a manufacturer that elects to certify to the optional medium-duty engine standards in title 13, CCR, §1956.8(c) or (h) shall not count those engines in the manufacturer's total production of California-certified medium-duty vehicles for purposes of this subsection.

(D) *Requirements for Small Volume Manufacturers***.** In 2001 through 2003 model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV Tier 1 standards in a quantity equivalent to 100% of its MDV fleet. In 2004 through 2006 ~~and subsequent~~ model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV LEV I standard~~s~~ in a quantity equivalent to 100% of its MDV fleet. Engines certified to these MDV LEV I standards are not be eligible for emissions averaging.

(E) For a manufacturer that elects to certify to the optional medium-duty engine standards in title 13,.CCR §1956.8(c) or (h), all such 2005 and subsequent model year MDVs, including those produced by a small volume manufacturer, shall be subject to the emissions averaging provisions applicable to heavy-duty diesel or Otto-cycle engines as set forth in the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," or the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines, incorporated by reference in §1956.8(b) or (d), as applicable.

(c) *Calculation of NMOG Credits/Debits.* [No change.]

(d) *Test Procedures.* The certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as amended ~~July 30, 2002~~ [INSERT DATE OF AMENDMENT], and the "California Non-Methane Organic Gas Test Procedures," as amended July 30, 2002, which are incorporated herein by reference. In the case of hybrid electric vehicles and on-board fuel-fired heaters, the certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the

Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962.

(e) *Abbreviations.* The following abbreviations are used in this section 1961:

"ALVW" means adjusted loaded vehicle weight.
"ASTM" means American Society of Testing and Materials.
"CO" means carbon monoxide.
"FTP" means Federal Test Procedure.
"g/mi" means grams per mile.
"GVW" means gross vehicle weight.
"GVWR" means gross vehicle weight rating.
"HEV" means hybrid-electric vehicle.
"LDT" means light-duty truck.
"LDT1" means a light-duty truck with a loaded vehicle weight of 0-3750 pounds.
"LDT2" means a "LEV II" light-duty truck with a loaded vehicle weight of 3751 pounds to a gross vehicle weight of 8500 pounds or a "LEV I" light-duty truck with a loaded vehicle weight of 3751-5750 pounds.
"LEV" means low-emission vehicle.
"LPG" means liquefied petroleum gas.
"LVW" means loaded vehicle weight.
"MDV" means medium-duty vehicle.
"mg/mi" means milligrams per mile.
<u>"NMHC" means non-methane hydrocarbons.</u>
"Non-Methane Organic Gases" or "NMOG" means the total mass of oxygenated and non-oxygenated hydrocarbon emissions.
"NOx" means oxides of nitrogen.
"PC" means passenger car.
"SULEV" means super-ultra-low-emission vehicle.
"TLEV" means transitional low-emission vehicle.
"ULEV" means ultra-low-emission vehicle.
"VEC" means vehicle-equivalent credits.
"VED" means vehicle-equivalent debits.
"VMT" means vehicle miles traveled.
<u>"ZEV" means zero-emission vehicle.</u>

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204, and 43205.5, Health and Safety Code.

**§ 1965. Emission Control and Smog Index Labels – 1979 and Subsequent Model-Year Motor Vehicles.**

In addition to all other requirements, emission control labels are required by the California certification procedures ~~and smog index labels shall conform to~~ contained in the "California Motor Vehicle Emission Control and Smog Index Label Specifications for 1978 through 2003 Model Year Motorcycles, Light-, Medium- And Heavy-Duty Engines And Vehicles," adopted March 1, 1978, as last amended ~~November 22, 2000~~] [INSERT LAST AMENDED DATE], which is incorporated herein by reference, the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty trucks and Medium-Duty Vehicles," incorporated by reference in §1961(d), the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles," incorporated by reference in §1956.8(b), the "California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric Vehicles in the Urban Bus and Heavy-Duty Vehicle Classes," incorporated by reference in §1956.8(b) and (d), and the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," incorporated by reference in §1956.8(d). Smog index labels for passenger cars and light-duty trucks shall conform to the "California Smog Index Label Specifications," adopted [INSERT ADOPTION DATE], which is incorporated herein by reference. Motorcycles shall meet the requirements of Title 40 Code of Federal Regulations section 86.413-78, as last amended October 28, 1977, which is incorporated herein by reference.

Note: Authority cited: Sections 39600, 39601 and 43200, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101, 43102, 43103, 43104, 43107 and 43200, Health and Safety Code.

**§ 1978. Standards and Test Procedures for Vehicle Refueling Emissions.**

(a)(1) Vehicle refueling emissions for 1998 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, fuel-flexible, and hybrid electric passenger cars, light-duty trucks, and medium-duty vehicles with a gross vehicle weight rating less than 8,501 pounds, shall not exceed the following standards. ~~Gaseous~~ Natural gas-fueled vehicles are exempt from meeting these refueling standards, but the refueling receptacles on natural gas-fueled vehicles must comply with the receptacle provisions of the American National Standards Institute/ American Gas Association Standard for Compressed Natural Gas Vehicle Fueling Connection Devices, ANSI/AGA NGV1 standard-1994, which is incorporated herein by reference. The standards apply equally to certification and in-use vehicles.

Hydrocarbons (for gasoline-fueled, diesel-fueled, and hybrid electric vehicles): 0.20 gram~~s~~ per gallon of fuel dispensed.

Organic Material Hydrocarbon Equivalent (for alcohol-fueled, fuel-flexible, and hybrid electric vehicles): 0.20 gram~~s~~ per gallon of fuel dispensed.

Hydrocarbons (for liquefied petroleum gas-fueled vehicles): 0.15 gram per gallon of fuel dispensed.

Subsections (a)(2) and (a)(3) [No change.]

(b) The test procedures for determining compliance with standards applicable to 1998 through 2000 gasoline, alcohol, diesel, and hybrid electric passenger cars, light-duty trucks, and medium-duty vehicles are set forth in the "California Refueling Emission Standards and Test Procedures for 1998-2000 Model Year Motor Vehicles," as amended August 5, 1999, which is incorporated herein by reference. The test procedures for determining compliance with standards applicable to 21001 and subsequent gasoline, alcohol, diesel, and hybrid electric passenger cars, light-duty trucks and medium-duty vehicles are set forth in the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," adopted August 5, 1999, and last amended [insert last amended date], which is incorporated herein by reference.

Note: Authority cited: Sections 39600, 39667, 43013, 43018, 43101 and 43104, Health and Safety Code. Reference: Sections 39003, 39500, 39667, 43000, 43013, 43018, 43101, 43102, and 43104, Health and Safety Code.

# APPENDIX B

# PROPOSED AMENDMENTS TO THE TEST PROCEDURES

## APPENDIX B

## DESCRIPTION OF PROPOSED AMENDMENTS

**I. Proposed Amendments to "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines,**" (hereinafter, HDG TPs) and title 13, CCR, §1956.8(c), (d) and (h)

1. Page 0 (before the Table of Contents).

~~2. "California Motor Vehicle Emission Control and Smog Index Label Specifications" (incorporated by reference in section 1965, title 13, CCR).~~

~~3. "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles" (incorporated by reference in section 1978(b), title 13, CCR).~~

3 ~~5~~. OBDII (section 1968~~.1~~, et seq., title 13, CCR, as applicable).

Items 2 and 3 of this page are deleted because these requirements only apply to vehicles (not engines) under 8,500 pounds GVW whereas the HDG TPs apply only to engines.

Item 5 is amended to refer to the multiple sections of title 13, CCR that apply to the on-board diagnostic requirements (specifically, 1968.1, 1968.2 and 1968.5), without specifically identifying the pertinent sections. The purpose of this amendment is to avoid having to update this document every time an amendment is proposed to the OBD II requirements. See the staff report for a more complete description of the proposed amendments.

2. Part I.1.B.3. The reference to small volume manufacturer, I.1.A.~~1.5~~ has been amended to provide a more generic reference because there are two sections in I.1.A that apply at present and there could be more in the future. By making this amendment generic, staff could avoid having to update this reference in the future.

Part I.l.B.5. This requirement has been moved to Part II of the test procedures. See §86.1342-94B.

3. Part I.2.B. These definitions have been added for completeness.

4. Part I.10.A.3. and A.4 [see also title 13, CCR, §1956.8(c)]. The proposed amendments remove the deletion of subparagraph (a)(1) (emission standards) and replace the text with: "Subparagraph (a): [No change.]." to reflect the alignment of the California exhaust emission standards with the federal standards. The separate reference to subparagraphs (a)(2) through (a)(4) is removed because those

subparagraphs are included subparagraph (a). The applicable emission standards are set forth in the table in Part I.10.B as well for clarity.

Part I.10.B [see also title 13, CCR, §1956.8(c)]. The proposed amendments in table in section B. would add the 2008 and subsequent federal exhaust emission standards, allow a manufacturer to participate in the federal ABT program, revise the medium-duty formaldehyde standard from 0.05 to 0.01 to align with the standard for urban buses, and add footnote F regarding idle carbon monoxide requirement which was inadvertently omitted in the previous version of the test procedures.

5. Part I.15. This proposed amendment would delete the federal requirement that allows the cross-trading of heavy-duty Otto-cycle engine credits with heavy-duty Otto-cycle vehicle credits.

6 Part I.17. See I.1, above.

7. Part I.23.B.2. This proposed amendment would allow the manufacturer to submit a statement of compliance with the formaldehyde standard in lieu of testing, as is allowed for light- and medium-duty vehicles.

8. Part I.35.A. See the staff report for a description of this proposed amendment. As mentioned in the staff report, the tune-up label specifications have been modified. The proposal would two new documents entitled, “California Motor Vehicle Emission Control and Smog Index Label Specifications for 1978 through 2003 Model Year Motorcycles, Light-, Medium- and Heavy-Duty Engines and Vehicles,” which sunsets the current label specifications, and the “California Smog Index Label Specifications for 2004 and Subsequent Model Passenger Cars and Light-Duty Trucks which contains only the Smog Index label requirements.” The proposed amendments are referenced in title 13, CCR, §1965.

Part I.35.B. This label requirement is being added at the request of the manufacturers because fleet owners in California are often only allowed to buy vehicles that have the California designation of LEV, ULEV or SULEV. The proposed amendment would add the ULEV label to engines certified to the federal Option 1 or 2 standards so that fleet owners could also purchase these vehicles which are actually cleaner than the California ULEVs. . (See 40 CFR 86.005-10(f).)

9. Part I.40. This requirement has not been deleted; rather staff is proposing adding a sentence to the federal language that makes the identical requirement applicable in California. This is done in order to make it clear that there is no distinction between the California and federal requirement.

10. Part II. The proposed amendments in this part add the more recent (but not new) sections of the Code of Federal Regulations to include them in the California version of the test procedures.

**II. Proposed amendments to the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles"** (hereinafter LDV/MDV TPs) and title 13, CCR §1961.

1. In the original version of the LDV/MDV TPs document, no adoption or amendment dates were added to the individual incorporated sections of the Code of Federal Regulations (CFR) because all were adopted on the same date -- May 4, 1999 – and that date was identified in the introductory paragraph. However, since then there have been several significant federal rulemakings (e.g., Tier 2 standards, etc) that have amended CFR sections that are incorporated into these LDV/MDV TPs. A proposed amendment in the introductory paragraph accounts for the differing amended dates of individual CFR sections by identifying only the original May 4, 1999 adoption date, with all subsequent adoption or incorporation dates being specified in the text of the LDV/MDV TPs where the particular CFR section is incorporated.

2. Part I.C.3. As mentioned in Section III.B.3.(a) of the staff report, the tune-up label specifications would be restructured. There would be two incorporated documents, one entitled "California Motor Vehicle Emission Control and Smog Index Label Specifications for 1978 through 2003 Model Year Motorcycles, Light-, Medium- and Heavy-Duty Engines and Vehicles," which sunsets the current label specifications, and a new document entitled "California Smog Index Label Specifications for 2004 and Subsequent Model Passenger Cars and Light-Duty Trucks," which addresses smog index label requirements only. The proposed amendments would be referenced in title 13, CCR, §1965.

3. Part I.D.1(e). [See I.1., above concerning the proposed amendment to the language referring to the OBD provisions.]

4. Part I.E. second introductory paragraph. Proposed new language would be added to clarify that a medium-duty diesel vehicle (as opposed to a medium-duty engine) that is certified federally to a chassis standard must also be chassis-certified in California. This language is necessary because in California, a manufacturer has the option of certifying a complete diesel vehicle to the engine standards whereas a federally-certified diesel medium-duty passenger vehicle (MDPV) in the same weight category must be chassis-certified. The proposed amendment would not allow the manufacturer of a federally chassis-certified vehicle (i.e., an MDPV) to be certified in California to the engine standards. If a diesel vehicle is not chassis-certified federally, however, the manufacturer would still have the option of certifying to the engine standards in California.

5. Part I.E1.1.1. The proposed amendment inserts the Tier 1 diesel option standard for LEV I passenger cars and light-duty trucks that was inadvertently omitted in the table for light-duty trucks 3751-5750 lbs. LVW. While this standard has remained in

the standards table in title 13, CCR, 1960.1(f)(2), it had been inadvertently omitted from the standards table in the LDV/MDV TPs document.

6. Part I.E.1.10(a), [see, also title 13, CCR, §1961(a)(12)]. The current version of the LDV/MDV TPs requires a manufacturer to determine the efficiency of a direct ozone reduction device using the Supplemental Federal Test Procedure test cycle. However, staff is proposing that the test cycle used for this determination be changed so that it is more representative of real world operating conditions, consistent with Manufacturer's Advisory Correspondence No. 99-06. The actual speed vs. time sequence of the Unified Cycle is added in Part II.E of the LDV/MDV TPs.

7. Part I.E.1.13, [see, also title 13, CCR §1961(a)(15)]. Staff is proposing that the scope of the ZEV fuel-fired heater requirement be expanded to apply to light- and medium-duty vehicles that incorporate such technology. A more complete description of the proposal is set forth in the staff report.

8. Part I.E.2.3. and Part I.E.3.2.4, [see, also title 13, CCR §1961(b)(3)]. These proposed amendments reflect the alignment of the California and federal heavy-duty exhaust emission standards as they apply to medium-duty engines. The proposed amendment sunsets the accrual of credits for medium-duty engines in California and allows the medium-duty engine manufacturer to participate in the federal ABT programs. A more complete description of the proposed amendments is contained in the staff report.

9. Part I.E.5. The LEV II regulations amended the weight classifications for light-duty trucks from 0-6,000 pounds GVW to 0 to 8,500 pounds GVW, and for medium-duty vehicles from 6,000-14,000 pounds GVW to 8,501-14,000 pounds GVW. However, because this table applies to both LEV I and LEV II vehicles, it is confusing and misleading to have only the LEV I weight classifications listed. Thus staff is proposing that the weight ranges that are listed in the table be removed, and that language be added that would just describe the vehicle category (e.g., passenger car, light-duty truck and keeping the medium-duty vehicle title) without specifying weight ranges.

10. Part I.G.8.1. This proposed amendment extends the allowable maintenance schedule for parts (such as the catalytic converter) that were previously only allowed to be changed at 100,000 miles to only allowing those emission-related parts to be changed at 120,000 miles. A more complete description of this proposed amendment is contained in the staff report.

11. Part I.H.1.4.7. This paragraph incorrectly references section E.1.4. The proposed amendment changes the reference to H.1.4, as was originally intended.

12. Part I.H.2.1. The federal regulations do not provide a timetable for the notification of approval or denial or running changes to a manufacturer. Traditionally in California the regulations have stated that the running changes will be deemed

approved within 30 days of notification by the manufacturer unless the Executive Officer has requested more information or denied the running changes. The LEV II amendments inadvertently omitted that language. This proposed amendment reinstates that language for California.

13. Part I.H.4.4. This proposed amendments contains the certification requirements for a manufacturer that elects to utilize a fuel-fired heater. See the staff report for a description of the proposed fuel-fired heater amendments.

14. Part I.J. These amendments add sections 86.1854 through 86.163. They are incorporated to update the California references to the CFR. These sections are not required in California.

15. Part II. The majority of the proposed amendments in this part are to incorporate recently adopted CFR sections.

16. Part II.D.3. This proposed amendment is to clarify that a manufacturer can only develop engine family specific reactivity adjustment factors for vehicles certified to LEV and ULEV standards. SULEVs are not eligible for engine-family specific reactivity factors since the baseline specific reactivity value is necessary to calculate the engine family specific RAF, and there is no such value specified for SULEVs.

17. Part II.E. This is a new section adding the speed vs. time sequence for the Unified Cycle Driving Schedule to be used by a manufacturer when determining the efficiency of a direct ozone reducing device. A description of this proposal is contained in the staff report.

**III. Proposed Amendments to the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines**," (hereinafter HDD TPs) and title 13, CCR 1956.8(a).

The format of this document has been reorganized and updated from the previous version of these test procedures that are now entitled the "California Exhaust Emission Standards and Test Procedures for 1985 through 2003 Model Heavy-Duty Diesel Engines and Vehicles. The proposed clarifying amendments are non-substantive except for the reduced formaldehyde standard for medium-duty engines. The format of the new HDD TPs much more closely follows the Code of Federal Regulations (CFR) as follows: in cases where the CFR section is incorporated by reference with no modifications, the notation "[No change.]" is used. In cases where the federal requirements are modified by California requirements, the notation "Amend [or delete) subparagraph (_) as follows:" is used. If the federal requirement is not applicable, the notation "[n/a]" is used. In cases where there are California only requirements, the additional California requirements are noted in a separate subsection with a separate numbering convention.

Although the 2007 standards approved by the Board in October, 2001 have not been formally adopted by the Office of Administrative Law, staff anticipates that the standards and these test procedures will be adopted in their entirety. Thus, the underline and strikeout provisions of that rulemaking have been added or removed as applicable. If there are changes by OAL, however, staff will present those changes in a 15-day modification, if necessary.

The current version of the HDD TPs, entitled, "California Exhaust Emission Standards and Test Procedures for 1985 ~~and Subsequent~~ through 2003 Model Heavy-Duty Diesel Engines and Vehicles would be sunset for the 2003 model year. All 2004 and subsequent model year requirements would be set forth in the new HDD TPs, entitled the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines."

## IV. Proposed amendments to the California Refueling Emission Standards And Test Procedures For 2001 And Subsequent Model Motor Vehicles

Proposed amendments to this document track the proposed amendments to title 13, CCR, section 1978, which are described in the staff report.

The exemption for gaseous-fueled vehicles would be deleted, and liquefied natural gas-fueled and natural gas-fueled vehicles would be added to the list of vehicles subject to the refueling requirements. Liquefied natural gas-fueled vehicles would be made subject to a refueling emissions standard identical to the applicable federal standard. Natural gas-fueled vehicles would be subject to the federal refueling receptacle requirements incorporated from 40 CFR section 86.1810-01(k)(3).