California Air Resources Board

PUBLIC MEETING AGENDA

March 25 - 26, 2004
9:00 a.m. / 8:30 a.m.

04-3-1 Public Meeting to Consider a Health Update

04-3-2 Public Meeting to Consider Research Proposals

04-3-3 Public Meeting to Consider Adoption of the Heavy-Duty Diesel Engine Software Upgrade Regulation (Chip Reflash)

Includes AcrobatTM ReaderTM

PC and Mac Compatible

ELECTRONIC BOARD BOOK

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

REVISED 3/16/04

LOCATION:

California Environmental Protection Agency
Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This facility is accessible by public transit. For transit information, call: (916) 321-BUSS, website www.sacrt.com (This facility is accessible to persons with disabilities.)

March 25 - 26, 2004
9:00 a.m./8:30 a.m.

04-3-1 Public Meeting to Consider a Health Update

As part of the regular monthly health update, staff will discuss an ARB funded study that investigated the relationship between exposure to toxic air pollutants and acute respiratory health effects. This pilot study looked at 26 school children with asthma living in Southern California and measured community exposure to air toxics. The investigators found a significant association between air toxics exposures and asthma symptoms. This was a pilot study and more work is needed on exposure to traffic and industrial related air toxics and acute respiratory effects.

04-3-2 Public Meeting to Consider Research Proposals

1. *"Effect of GSTM1 Genotype on Ozone-Induced Allergic Airway Inflammation," University of California, San Francisco, $497,990 Proposal No. 2541-232.*

2. *"Determination of Reactive Oxygen Species Activity in Particulate Matter (PM) and Enhanced Exposure Assessment for the NIH, NIEHS Study Entitled: Ultrafine Particulate Matter and Cardiorespiratory Health," University of California, Irvine, $676,814 Proposal No. 2545-233.*

3. *"Development of a Micro Air Particulate Analyzer (MicroAPA) for Ubiquitous Deployment in Air Quality Monitoring and Epidemiological Studies," University of California, Davis, $225,310. Proposal No. 2549-234.*

4. *"Evaluation of Mechanisms of Exhaust Intrusion into School Buses and Feasible Mitigation Measures," University of California, Riverside, $299,999, Proposal No. 2549-235.*

5. *"Evaluation of the Heavy-Duty Diesel Engine Not-To-Exceed Regulation," University of California, Riverside, $400,000, Proposal No. 2549-236.*

CONTACT CLERK OF THE BOARD, 1001 I Street, 23rd Floor, Sacramento, CA 95814 (916) 322-5594
FAX: (916) 322-3928
ARB Homepage: www.arb.ca.gov

To submit written comments on an agenda item in advance of the meeting.
To request special accommodation or language needs.
TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

04-3-3 Public Hearing to Consider Adoption of the Heavy-Duty Diesel Engine Software Upgrade Regulations (Chip Reflash)

This proposal would require owners of 1993-1999 heavy-duty diesel trucks to have low NOx software installed. Engine manufacturers were required to develop and provide the software under federal Consent Decree/California Settlement Agreements, to partially mitigate off-cycle NOx emissions.

CLOSED SESSION - LITIGATION

The Board will hold a closed session as authorized by Government Code section 11126(e) to confer with, or receive advice from, its legal counsel regarding the following pending litigation:

Concerning Public Hearing to Consider Adoption of the Heavy-Duty Diesel Engine Software Upgrade Regulations (Chip Reflash)

OPEN SESSION TO PROVIDE AN OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE BOARD ON SUBJECT MATTERS WITHIN THE JURISDICTION OF THE BOARD.

Although no formal Board action may be taken, the Board is allowing an opportunity to interested members of the public to address the Board on items of interest that are within the Board's jurisdiction, but that do not specifically appear on the agenda. Each person will be allowed a maximum of five minutes to ensure that everyone has a chance to speak.

THOSE ITEMS ABOVE THAT ARE NOT COMPLETED ON MARCH 25 WILL BE HEARD BEGINNING AT 8:30 A.M. ON MARCH 26.

THE AGENDA ITEMS LISTED ABOVE MAY BE CONSIDERED IN A DIFFERENT ORDER AT THE BOARD MEETING.

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

LOCATION:

California Environmental Protection Agency
Air Resources Board
Central Valley Auditorium, Second Floor
1001 I Street
Sacramento, CA 95814

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March 25 - 26, 2004
9:00 a.m./8:30 a.m.

		Pages
04-3-3	**Public Meeting to Consider adoption of the Heavy-Duty Diesel Engine Software Upgrade Regulation (Chip Reflash)**	**1-116**

CONTACT CLERK OF THE BOARD, 1001 I Street, 23rd Floor, Sacramento, CA 95814 **(916) 322-5594**
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SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

TITLE 13. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION OF THE HEAVY-DUTY DIESEL ENGINE SOFTWARE UPGRADE REGULATION (CHIP REFLASH)

The Air Resources Board (the Board or ARB) will conduct a public hearing at the time and place noted below to consider adopting the proposed heavy-duty diesel engine software upgrade regulation. This proposed software upgrade regulation would mandate installation of software to reduce emissions of oxides of nitrogen (NOx) from 1993-1999 model year heavy-duty vehicles. The proposed regulation would also make minor, mostly related, modifications to the Heavy-Duty Vehicle Smoke and Fleet Inspection programs.

The software upgrades, referred to as low NOx software, were developed in the 1990s as a result of negotiations between the United States Environmental Protection Agency (U.S. EPA), the ARB, and seven engine manufacturers. Owners of eligible vehicles and dealers/distributors with the capability to install the software would have responsibilities under the proposed regulation. This notice summarizes the proposed regulation requirements.

DATE: March 25, 2004

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
1001 I Street
Auditorium, Second Floor
Sacramento, CA 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., March 25, 2004, and may continue at 8:30 a.m., March 26, 2004. This item may not be considered until March 26, 2004. Please consult the agenda for the meeting, which will be available at least 10 days before March 25, 2004, to determine the day on which this item will be considered.

If you have special accommodation or language needs, please contact the ARB's Clerk of the Board at (916) 322-5594 or amalik@arb.ca.gov as soon as possible. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed adoption of section 2011 in new article 3.5 within chapter 1, division 3, title 13, California Code of Regulations (CCR). Proposed amendments to sections 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194 of article 1, chapter 3.5, division 3, title 13, CCR.

What is ARB proposing?

The ARB staff is proposing to reduce air pollution by requiring owners and operators of trucks, school buses, and motor homes with 1993-1998 model year heavy-duty diesel engines to upgrade the software in the electronic control module (ECM) of these engines. Software upgrades were developed by the engine manufacturers and are available now for most 1993-1998 model year engines. If adopted, owners and operators of eligible vehicles that operate in California must ensure that their vehicles' engines have the appropriate low NOx software installed. Since many 1999 model year vehicles have engines produced in 1998, owners and operators of 1999 model year vehicles will need to check to determine if they are affected. Distributors and dealers must provide the appropriate low NOx software to the vehicle owner or operator upon request.

What is a heavy-duty diesel engine software upgrade?

A heavy-duty diesel software upgrade (also referred to as low NOx software upgrade or chip reflash) is simply software installed in the engine that reprograms the vehicle's computer and reduces off-cycle NOx emissions. The installation process typically takes between one-half to one hour.

The ARB staff has prepared a list that can be checked to determine if low NOx software is available for the engine. This list is available from our web site at: http://www.arb.ca.gov/msprog/hdsoftware/hdsoftware.htm

Would out-of-state vehicles be subject to the proposed requirements?

Yes. If adopted, owners and operators of 1993-1999 model year heavy-duty diesel vehicles (trucks, school buses, and motor homes) registered out-of-state, but that travel within California, would also be required to ensure that the engines in their vehicles have the appropriate low NOx software installed.

How much would the low NOx software installation cost?

The ARB staff believes the applicable Consent Decrees and Settlement Agreements require manufacturers to supply the Low NOx software at no cost whenever it is requested. Out-of-service costs to the vehicle owner can be reduced or eliminated if the low NOx software is installed at the same time as another service or repair.

When would low NOx software have to be installed?

If adopted by the Board, this regulation would require the low NOx software upgrade to be installed on a schedule that depends on the model year of the engine in the affected vehicle. Our proposal is as follows:

1993-1994 model years	By April 30, 2005
1995-1996 model years	By August 31, 2005
1997-1998 model years	By December 31, 2005 (except for medium heavy-duty diesel engines (MHDDEs))
1997-1998 model year MHDDEs	By December 31, 2006

How would the low NOx software installations be enforced?

The ARB enforcement staff would verify the installations of the low NOx software through a modified Heavy-Duty Vehicle Inspection Program and modified Heavy-Duty Vehicle Fleet Inspection Program.

How will I know if the regulation is adopted, and it is time to have the software installed?

If the Board adopts this proposed regulation and it becomes effective, the ARB staff will attempt to reach you by mail with an alert stating that the regulation is effective and including the dates that low NOx software is required to be installed in your engine. An informational notice would also be posted on the ARB website.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The Board staff has prepared a staff report: Initial Statement of Reasons (ISOR) for the Proposed Regulation, which includes a summary of the environmental and economic impacts of the proposal and supporting documentation. The staff report is entitled: "Initial Statement of Reasons, Public Hearing to Consider Adoption of The Heavy-Duty Diesel Engine Software Upgrade Regulation (Chip Reflash)" and includes a supplement which updates the proposed compliance dates.

Copies of the staff report and the full text of the proposed regulatory language, in underline and strikeout format to allow for comparison with the existing regulations, may be accessed on the ARB's web site listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, CA 95814, (916) 322-2990 at least 45 days prior to the scheduled hearing March 25, 2003.

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on the ARB's web site listed below.

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Lisa Jennings, Air Pollution Specialist, at (916) 322-6913, or Earl Landberg, Air Pollution Specialist, at (916) 323-1384.

Procedural inquiries for the proposed administrative action may be directed to Artavia Edwards, Manager, Board Administration & Regulatory Coordination Unit, (916) 322-6070, or Alexa Malik, Regulations Coordinator, (916) 322-4011. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

If you are a person with a disability and desire to obtain this document in an alternative format, please contact the ARB's Clerk of the Board at (916) 322-5594 or amalik@arb.ca.gov as soon as possible. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at www.arb.ca.gov/regact/chip04/chip04.htm

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action will not create costs or savings to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code, or other nondiscretionary savings to state or local agencies.

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons or businesses. There may be as many as 40,000 businesses, up to 3,000 school districts, and over 5,000 individuals who own motor homes with 1993-1999 model year heavy-duty diesel vehicles affected by this proposal. Also affected are approximately 100 dealers/distributors for Caterpillar, Cummins, Detroit Diesel, Mack/Renault, International (Navistar), or Volvo that have the capability to install low NOx software into an eligible engine's ECM. Finally, this proposal will also affect the seven engine manufacturers mentioned already – each of which is located outside of California. The total statewide costs that businesses and individuals may incur to comply with this regulation over its lifetime are up to eight million dollars.

The ARB staff believes that the low NOx software should be provided and installed free of charge to vehicle owners and operators. If engine manufacturers reimburse the dealers and distributors for labor charges, the only cost to the vehicle owner would be the time that the vehicle is out-of-service. This includes time: 1) to drive the vehicle to the dealer or distributor facility; 2) to install the low NOx software; and 3) to return the vehicle back to service. Waiting time would be minimized if vehicle owners and operators make an appointment with the dealer or distributor. This "time cost" can be reduced to next to nothing if the low NOx software is installed at the same time that another service or repair is performed on the vehicle.

The Executive Officer has made an initial determination that the proposed regulatory action will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

In accordance with Government Code section 11346.3, the Executive Officer has determined that the proposed regulatory action will not affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the staff report (ISOR).

The Executive Officer has also determined, pursuant to Title 1, CCR, section 4, that the proposed regulatory action will affect small businesses. Staff was unable to determine the number or percentage of total businesses impacted that are small businesses. Staff believes that some of the approximately 40,000 companies (based on our mail-out) that own 1993-1999 model year heavy-duty diesel vehicles affected by this proposal are small businesses based on income, profit, number of employees, or number of vehicles owned. Some of the

dealers/distributors affected may also be small businesses. Staff has estimated the initial cost for a small business at 0-200 dollars (for time out-of-service) with the typical business spending 0-1500 dollars to comply with this regulatory proposal.

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the ARB's Executive Officer has found that the reporting requirements of the regulation which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing or by e-mail before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received **no later than 12:00 noon, March 24, 2004**, and addressed to the following:

Postal mail is to be sent to:

Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, California 95814

Electronic mail is to be sent to: chip04@listserv.arb.ca.gov and received at the ARB **no later than 12:00 noon, March 24, 2004**. Facsimile transmissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at the ARB **no later than 12:00 noon March 24, 2004**.

The Board requests but does not require that 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The ARB encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under that authority granted in Health and Safety Code, sections 39600, 39601, 43013, 43018, 43701, and 44011.6.

This action is proposed to implement, interpret and make specific sections 39001, 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6 Health and Safety Code, and sections 305, 505, 545, and 2813 Vehicle Code.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Title 2, Division 3, Part 1, Chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with non substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action; in such event the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Public Information Office, Sacramento, CA 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD

Michael N. Schulte

for Catherine Witherspoon
Executive Officer

Date: January 27, 2004

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs see our Web –site at www.arb.ca.gov.

State of California
AIR RESOURCES BOARD

INITIAL STATEMENT OF REASONS

PUBLIC HEARING TO CONSIDER ADOPTION OF THE HEAVY-DUTY DIESEL ENGINE SOFTWARE UPGRADE REGULATION (CHIP REFLASH)

Date of Release: February 6, 2004
Scheduled for Consideration: March 25, 2004

ATTACHMENT A

STAFF REPORT: INITIAL STATEMENT OF REASONS

PUBLIC HEARING TO CONSIDER ADOPTION OF THE HEAVY-DUTY DIESEL ENGINE SOFTWARE UPGRADE REGULATION

Released September 5, 2003

ATTACHMENT B

PROPOSED REGULATION ORDER

ATTACHMENT C

DESCRIPTIVE LIST OF REGULATORY TEXT CHANGES PROPOSED

FOR THE HEAVY DUTY VEHICLE ROADSIDE INSPECTION PROGRAM

AND THE HEAVY DUTY VEHICLE FLEET INSPECTION PROGRAM

I. INTRODUCTION

A. OVERVIEW

The September 5, 2003, Initial Statement of Reasons (ISOR) for Heavy-Duty Diesel Engine Software Upgrade (Chip Reflash) and its referenced and incorporated documents are hereby incorporated by reference and included here as Attachment A. The incorporated Attachment A and this supplemental three page document constitute the ISOR for this same titled regulatory action noticed herein on February 6, 2004. This three page document outlines the changes staff has made to the original September 5, 2003, proposal to develop this updated proposal. The Board will hear this updated proposal at a public hearing commencing March 25, 2004. The Board heard the original proposal at its December 11, 2003, public meeting.

B. BACKGROUND

On September 5, 2003, ARB staff released an Initial Statement of Reasons outlining a proposed regulation for Heavy-Duty Diesel Engine Software Upgrade (Chip Reflash). The proposal was presented to the Board on December 11, 2003; however, the Board did not vote on the proposed rulemaking due to Governor Schwarzenegger's direction to state agencies to review regulations for their impacts on business. (Executive Order S-2-03.)

The staff is returning to the Board in March 2004 to request a vote on the proposed regulation. The delay in potential Board adoption of this regulatory proposal has necessitated changes to the proposed compliance dates in the implementation schedule. Additionally, minor revisions and improvements are also included in the proposed regulatory language. The proposed changes are described below and are reflected in the revised underline and ~~strikeout~~ text in the Proposed Regulation Order located in Attachment B, which includes changes made since the September 5, 2003 proposal.

This staff proposal includes the same substantive requirements regarding chip reflash as those originally noticed (California Regulatory Notice Register 2003, NO. 36-Z) and heard by the Board on December 11, 2003, but with implementation deadlines later than those noticed on September 5, 2003. The revised implementation deadlines are proposed to run through December 2006. Other revisions include additional amendments, some of which are not specifically tied to scan tool evaluations, that are proposed for the Heavy-Duty Vehicle Inspection Program (HDVIP) and Heavy Duty Vehicle Fleet Inspection (Fleet Inspection) program regulations.

Staff may propose a voluntary software upgrade program, based on discussions with the engine manufacturers and the California Trucking Association, which if successful, could be implemented in lieu of finalizing the regulatory package noticed herein.

II. CHANGES TO THE ORIGINALLY PROPOSED REGULATION

As stated before, an originally proposed Heavy-Duty Diesel Engine Software Upgrade (Chip Reflash) regulation was released on September 5, 2003. This February 6, 2004, proposal is an update of that proposal. This proposal is essentially the same as the previous proposal with extended compliance dates in the implementation schedule. The changes to the September 5, 2003, proposal are described in the following paragraphs and are included in the Proposed Regulation Order in Attachment B. In addition to the following discussion, additional rationale for the proposed changes to the HDVIP and Fleet Inspection programs, including rationales for changes specifically to provide for Chip Reflash enforcement, are summarized in Attachment C.

A. COMPLIANCE DATES

The originally proposed compliance dates were chosen so that implementation of the low NOx software upgrade would occur soon after the public board meeting. Because the original Board meeting date was October 2003 and the new Board meeting date is March 2004, additional time is proposed for compliance.

The new implementation schedule that is being proposed in the Heavy-Duty Diesel Engine Software Upgrade (Chip Reflash) proposal is as follows:

1993-1994 model years	By April 30, 2005
1995-1996 model years	By August 31, 2005
1997-1998 model years	By December 31, 2005 (except for medium heavy-duty diesel engines (MHDDEs))
1997-1998 model year MHDDEs	By December 31, 2006

The updated proposal also allows an additional year for compliance by 1997 and 1998 model year medium heavy-duty diesel engines. The 1997 and 1998 medium heavy-duty diesel engines are newer than the 1993 through 1996 model year engines, drive fewer miles than the heavy-duty diesel engines, and are also less likely to have acquired the number of miles that was expected to trigger rebuild. Engine rebuild would be accompanied by the installation of software upgrade. Furthermore, the medium heavy-duty engines contribute a much smaller part of the off-cycle NOx emissions that this measure is aiming to control.

Also, in section 2011 (c)(1), the rebuild option for Renault is now correctly listed as Option B for model years 1993-1998, rather than A for model years 1994-1998, as stated in the referenced staff report released on September 5, 2003.

B. IMPROVEMENTS TO THE REGULATORY LANGUAGE

Other improvements to the Chip Reflash regulatory language include clarifying its applicability; adding definitions to improve clarity; and specifying that dealers,

distributors, repair facilities, and rebuild facilities would provide and install the low NOx software. The revised regulatory language also specifies that installation of low NOx software performed as part of an approved incentive or offset project fulfills the requirement of the proposed regulation.

Because the low NOx software installations will be enforced via the HDVIP and Fleet Inspection programs, additional changes are being proposed to further clarify how those programs will include inspections to determine if the low NOx software has been installed, and how those programs will calculate penalties for failure to install software by the dates specified above. In addition, other changes are being proposed that clarify the original intent and streamline enforcement of the HDVIP and Fleet Inspection programs generally. For example, amendments are proposed to require submittal of a Demonstration of Correction Form and to limit ARB post-repair inspections to repeat offenders.

C. OTHER REVISIONS

Other proposed revisions to the HDVIP program improve the consistency of the language for the Scan Tool Evaluations under Section 2185 Civil Penalty Schedule. Minor rewording occurs for the requirements in paragraphs (a), (b), and (d) and under Section 2186 Demonstration of Correction and Post-Repair Test or Inspection. Section 2186 (c) is proposed to be reformatted. Additional minor reformatting and cross-referencing revisions are described in Attachment C.

III. IMPACTS OF THE CHANGES TO THE ORIGINALLY PROPOSED REGULATION

The impacts of the proposed regulation are discussed in the staff report released September 5, 2003. The estimated emission benefits of the proposed regulation from California-registered vehicles are 8 to 10 tons per day in the South Coast Air Basin in 2010. Under the revised compliance schedule proposed in this supplemental staff report, the heavy-duty fleet would not be entirely reflashed until the end of 2005. Therefore, the 30 to 40 tons per day statewide emission reductions from in-state vehicles would not be realized until the end of 2005.

IV. STAFF RECOMMENDATION

The ARB staff recommends that the Board adopt a new section 2011, title 13, California Code of Regulations and amend sections 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194, title 13, California Code of Regulations. The regulation is set forth in the Proposed Regulation Order in Attachment B.

ATTACHMENT A

STAFF REPORT: INITIAL STATEMENT OF REASONS

PUBLIC HEARING TO CONSIDER ADOPTION OF THE HEAVY-DUTY DIESEL ENGINE SOFTWARE UPGRADE REGULATION

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS

PUBLIC HEARING TO CONSIDER ADOPTION OF THE HEAVY-DUTY DIESEL ENGINE SOFTWARE UPGRADE REGULATION (CHIP REFLASH)

Date of Release: September 5, 2003
Scheduled for Consideration: October 23, 2003

EXECUTIVE SUMMARY

The residents of California continue to be exposed to air quality that exceeds both the state and the national standards for ozone (or smog). Heavy-duty diesel engines are a significant source of oxides of nitrogen (NOx) emissions, which are part of an atmospheric reaction that forms smog. The Air Resources Board (ARB or the Board) lowered the NOx emission certification standard for heavy-duty diesel engines in 1991 and again in 1998 as part of the on-going effort to attain clean air. However, much of these emissions benefits have not been realized in-use due to dual calibrations used by the engine manufacturers in certain 1993-1998 model year heavy-duty diesel engines. (Dual calibration means one calibration was used during the emissions test and another calibration was used for on-highway use that was not emissions tested). In fact, the real-life emissions of these 1993-1998 model year engines are significantly higher than one would expect from their certification standards due to this "off-cycle" computer programming used by the engine manufacturers.

Both the ARB and the U.S. Environmental Protection Agency (U.S. EPA) reached agreements with the engine manufacturers that were to significantly offset the excess emissions caused by the off-cycle programming. The agreements included a number of mitigating measures that have been done, including development of low NOx software. However, years later, a core component of the agreements - installing the low NOx software - has been done on less than ten percent of the engines.

At this point, the software has been developed and it has been demonstrated to effectively mitigate much of the excess emissions with no adverse consequences. Heavy-duty diesel vehicles only need to go to dealerships to have the low NOx software uploaded (a one half hour to one hour process). However, because the software is not being installed as expected under the agreements with the manufacturers, the excess emissions continue to go unchecked. The ARB staff is recommending that the Board adopt a requirement that owners and operators of 1993-1999 model year heavy-duty trucks, school buses, and motor homes that use 1993-1998 model year heavy-duty diesel engines upgrade the software in their engine's electronic control module (ECM).

The ARB staff is recommending a staggered implementation schedule that would require installations before 2005. Enforcement would occur through the ARB's Heavy-Duty Vehicle Smoke Inspection Program and Periodic Smoke Inspection Program, where the software could readily be checked. The penalty for non-compliance for most vehicles would be $300 if the low NOx software were installed within 45 days of issuance of a citation, and an additional $500 penalty if the low NOx software were not installed until after 45 days of issuance of a citation.

The emissions benefits associated with the low NOx software upgrade are significant. NOx emissions would be reduced 30-40 tons per day in 2005 from California-registered vehicles and an additional six to nine tons per day from out-of-state registered vehicles. The cost-effectiveness of the proposal is excellent. At less that $100 per ton of NOx reduced, it is more cost-effective than many regulatory control measures already adopted by the ARB.

I. OVERVIEW

A. INTRODUCTION

1. What is the ARB proposing?

The California Air Resources Board (ARB or Board) staff is proposing to reduce air pollution by requiring owners and operators of trucks, school buses, and motor homes with 1993-1998 model year heavy-duty diesel engines to upgrade the software in the electronic control module (ECM) of these engines. Software upgrades were developed by the engine manufacturers and are available now for most 1993-1998 model year engines used in 1993-1999 model year vehicles.

2. What is a heavy-duty diesel engine software upgrade?

Most heavy-duty diesel engines produced in the 1990s use software that causes the engines in-use to emit oxides of nitrogen (NOx) at two or three times above allowable certification test levels. Heavy-duty diesel software upgrade (also referred to as low NOx software upgrade or chip reflash) is simply software installed in the ECM that reduces these excess NOx emissions.

3. What are off-cycle NOx emissions?

The U.S. Environmental Protection Agency (U.S. EPA), the Department of Justice, and the ARB discovered that seven large manufacturers had, during the 1990s, designed engines with advanced computer controls (software) that maximized fuel economy and created "off-cycle" NOx emissions during certain periods of vehicle operation, such as long-haul driving. Over a million heavy-duty diesel engines manufactured over a period of nearly ten years emitted off-cycle NOx emissions. Most of these engines are still emitting off-cycle NOx emissions today.

4. Why was low NOx software developed?

The software was developed as part of the Low NOx Rebuild Program stipulated in the federal Consent Decrees signed by the U.S. EPA, the Department of Justice, and the affected engine manufacturers. The State of California has similar agreements, called "Settlement Agreements."

5. What are the Consent Decrees and the Settlement Agreements?

The federal Consent Decrees and the California-specific Settlement Agreements are legally-binding agreements with seven engine manufacturers requiring them to partially mitigate their off-cycle NOx emissions and to take corrective action to ensure that future new engines do not produce off-cycle NOx emissions. As part of

the Consent Decrees/Settlement Agreements, the engine manufacturers are required to provide low NOx software upgrades free of charge upon rebuild or upon request.

B. APPLICABILITY

1. Who would be affected by the proposed heavy-duty diesel software upgrade regulation?

Most owners and operators of 1993-1999 model year heavy-duty diesel trucks, school buses, and motor homes that use 1993-1998 model year engines and that operate in California must ensure that their vehicles have the appropriate low NOx software installed. Distributors and dealers must provide the appropriate low NOx software to the vehicle owner or operator upon request.

2. Would out-of-state vehicles be subject to the proposed requirements?

Yes. If adopted, owners and operators of 1993-1999 model year heavy-duty diesel vehicles (trucks, school buses, and motor homes) that use 1993-1998 model year engines and are registered out-of-state but travel within California would also be required to ensure that the engines in their vehicles have the appropriate low NOx software installed.

3. How do I tell if my heavy-duty diesel vehicle would need low NOx software installed?

Check your engine emission control label for the manufacturer of the engine and the engine model in your heavy-duty diesel vehicle.

Caterpillar, Cummins, and Renault have low NOx software for 1993-1998 model year heavy-duty diesel truck engines. Detroit Diesel, Mack, and Volvo have low NOx software for 1994-1998 model year heavy-duty diesel truck engines. International (formerly Navistar) has low NOx software for its 1998 model year heavy-duty diesel truck engines. Engines referred to as truck engines are used not only in trucks, but also in school buses and motor homes. If low NOx software has been developed for your vehicle's engine, you would be required to install it under the proposed regulation, once it is adopted.

The ARB staff has prepared a list of engines that have low NOx software available. Compare your engine manufacturer and engine model with the prepared list, which is included as Appendix C to this staff report, or is available from our web site at: http://www.arb.ca.gov/msprog/hdsoftware/hdsoftware.htm Owners and operators of 1999 model year trucks, school buses and motor homes would also need to check their engines against this list, since many 1999 model year vehicles are equipped with engines produced in 1998.

4. How many California-registered vehicles would be required to install low NOx software?

We estimate that there are about 100,000 California-registered heavy-duty diesel trucks, school buses, and motor homes with 1993-1998 model year engines eligible for low NOx software upgrade. Between four and ten percent of these vehicles may already have the low NOx software upgrade installed.

5. How many out-of-state vehicles would be required to install low NOx software?

We estimate 300,000 to 400,000 out-of-state heavy-duty diesel vehicles with 1993-1998 model year engines visit California and would be subject to the proposed regulation.

C. NEED FOR NOx REDUCTIONS

1. What are the health effects associated with NOx emissions?

NOx is a pollutant that is harmful to human health. It causes lung irritation and lung damage. NOx also reacts in the atmosphere to form ozone (smog) and contributes to the secondary formation of particulate matter, which results in haze. Smog contributes to breathing difficulties and lung tissue damage. Particulate matter contributes to increased respiratory disease, lung damage, cancer, and premature death. NOx, and the ozone and fine particulate matter it forms, are especially damaging to children, contributing to slower lung growth and development and decreased lung functioning.

2. Why does California need NOx reductions?

California is required to attain the National Ambient Air Quality Standards (NAAQS) and the more stringent California standards. Failure to meet the NAAQS could subject California to lawsuits and sanctions, including the loss of federal highway funds. Without this measure and others, residents of California would continue to breathe unhealthy air. In short, we need NOx reductions to protect public health and to preserve the state's federal highway funding.

3. Does California have a plan to meet the National Ambient Air Quality Standards?

California's plan for meeting the NAAQS is contained in our State Implementation Plan, or SIP. The ARB is currently updating California's SIP and is working with local air districts and the U.S. EPA to develop, adopt, and implement strategies to reduce emissions from all pollution sources in various regions in California. Once the SIP is approved, the strategies in the SIP become legally-binding commitments.

The local, state, and federal strategies in the SIP must together reduce emissions by an amount sufficient to meet the NAAQS by a specified timeframe for a specific region. The reductions from this proposed regulation are a critical component to achieving the total emission reductions needed to meet our SIP commitments.

D. PROPOSED REQUIREMENTS

1. When would I have to have low NOx software installed?

If the regulation is adopted by the Board as proposed by the staff, the low NOx software upgrade must be installed between April and December 2004, depending on the model year of the engine in your vehicle. Our proposal is as follows:

1993-1994 model years	By April 30, 2004
1995-1996 model years	By August 31, 2004
1997-1998 model years	By December 31, 2004

2. How do I get the low NOx software installed?

Go to your local engine dealer or distributor and request the low NOx software for your engine. You may choose to arrange to have the low NOx software upgrade installed when your vehicle is having other maintenance performed in order to avoid an additional trip to the engine dealer or distributor. In some cases, owners with large fleets may be able to arrange for the software to be installed on-site.

3. Can the software be installed outside of California?

Yes. The low NOx software is available throughout the nation, not just in California. Vehicle owners and operators may use their own local engine dealers and distributors for the installation of the low NOx software upgrade.

4. How long would the low NOx software installation take?

The low NOx software upgrade takes only about 15 to 30 minutes to install on your engine's ECM. In some cases, the installation may take longer (if, for example, your ECM is especially hard to access). Of course, time is required for driving your vehicle to and from the engine dealer or distributor. Additionally, there may also be waiting time once you are at the dealer or distributor – this could be reduced or eliminated by scheduling an appointment. If the low NOx software upgrade is performed at the same time as you are having other service performed, your vehicle should not be out of service any additional significant amount of time.

5. How would the low NOx software installations be enforced?

The ARB enforcement staff already inspects heavy-duty vehicles at California Highway Patrol (CHP) weigh stations, randomly selected roadside locations, and

fleet facilities for excessive smoke and tampering. This proposal would amend the inspection process to add a scan tool evaluation to verify that the correct low NOx software has been installed. Failure to have the low NOx software installed would result in a citation accompanied by monetary penalties.

6. Is this like smog check for trucks?

No. There are no in-use emission limits that vehicles would have to meet as part of this proposal.

7. What is the proposed penalty for not installing the low NOx software as required?

The penalty would be $300 if the low NOx software were installed within 45 days of issuance of a citation. If the software were not installed until after 45 days of issuance of a citation, there would be an additional $500 penalty. The penalties for the failure to install the low NOx software apply to both California-registered vehicles and out-of-state registered vehicles, and would be in addition to any penalties incurred in the HDVIP for excessive smoke and tampering.

8. Are there any proposed exemptions from these penalties?

The $300 penalty would be waived for California-registered school buses if the low NOx software were installed within 45 days of issuance of a citation. If the software were not installed until after 45 days of issuance of a citation, both the $300 penalty and the additional $500 penalty would apply.

E. BENEFITS AND COSTS

1. How much would the low NOx software installation cost?

The low NOx software should be provided and installed free of charge to vehicle owners and operators. Engine manufacturers have a responsibility to mitigate the excess NOx emissions caused by the "computer-based strategies" they programmed into their engines. The ARB staff believes the applicable Consent Decrees and Settlement Agreements require manufacturers to supply the Low NOx software at no added cost whenever it is requested.

Some engine manufacturers have provided the software free of charge to all that request it. Unfortunately, some engine manufacturers are not installing the low NOx software free of charge unless it is installed in conjunction with an engine rebuild. If those engine manufacturers continue refusing to reimburse the dealers/distributors, dealers and distributors might pass charges on to the vehicle owner/operator for about one-half to one hour of labor. The ARB is pressing the engine manufacturers to meet their obligations so that the vehicle operators and owners incur no costs.

2. What will be the cost to the vehicle owner/operator?

The only cost to the vehicle owner should be the time that the vehicle is out-of-service. We have estimated two hours as the average time out-of-service. This estimate includes time: 1) to drive the vehicle to the dealer or distributor facility; 2) to install the low NOx software; and 3) to return the vehicle back to service. If you make an appointment with your dealer or distributor, your waiting time would be minimized. This "time cost" can be reduced to next to nothing if the low NOx software is installed at the same time as another service or repair is performed on your vehicle.

3. How would low NOx software affect fuel economy?

Manufacturers have reported negligible fuel economy differences. Several fleets have had the low NOx software installed prior to rebuild and have reported no noticeable differences in their fuel use. However, there is a potential for a minor fuel economy penalty. We expect the average fuel economy penalty, if any, to be below one percent.

4. How would low NOx software affect the operation of my vehicle?

According to the engine manufacturers, the low NOx software upgrade should have no adverse affects on the operation of your vehicle.

5. How much would the proposed requirements reduce emissions?

This regulation, once implemented, will reduce NOx emissions 30–40 tons per day statewide from California-registered vehicles by the year 2005. We estimate that NOx emissions will be reduced by an additional six to nine tons per day by 2005 from out-of-state registered vehicles traveling in California. The NOx benefits from this regulation are equivalent to taking more than 600,000 passenger vehicles off the road in 2005.

6. Is the proposed regulation cost-effective?

Yes, the proposed regulation is cost-effective at less than $100 per ton of NOx reduced. This cost-effectiveness value assumes that there are no labor charges to the vehicle owner for the installation of the low NOx software. The proposed regulation compares favorably with the cost-effectiveness of other ARB mobile source regulations.

F. OTHER QUESTIONS

1. How many software installations have already been done?

To date, about four percent to ten percent of heavy-duty diesel vehicles with eligible engines have already had the low NOx software upgrade installed. This means that between about 4,000 and 10,000 heavy-duty diesel vehicles registered in California now have the low NOx software upgrade. Of the vehicles registered out-of-state that travel in California, we estimate that between 12,000 and 40,000 now have the low NOx software upgrade.

2. Why haven't more software installations been done?

There are several factors that may be causing the low rate of low NOx software installation to date.

First, engines are lasting longer than the ARB expected. When the Low NOx Rebuild Program was included in the Consent Decrees/Settlement Agreements, the ARB expected engine rebuilds to occur at around 300,000 to 400,000 miles of service based on prevailing information regarding engine rebuild practices. Under this precept, most heavy-duty diesel trucks with 1993-1998 model year engines should have been rebuilt by now. But the increased durability of the diesel engine has enabled many engines to run 750,000 to 1,000,000 miles before needing a rebuild.

Second, engines subject to the Consent Decree/Settlement Agreement Low NOx rebuild requirements are used in school buses and motor homes, which travel significantly fewer annual miles than do long-haul trucks. Additionally, the poor economy during the past few years may have contributed to vehicle owners delaying their engine rebuilds.

Finally, in some cases the software upgrade installations may not be occurring at the time of rebuild, even though it is required.

3. Why didn't the U.S. EPA and the ARB recall these vehicles and require software upgrade when we first found the problem?

During the Consent Decree/Settlement Agreement negotiations, the U.S. EPA and the ARB expected that installing the low NOx rebuild kits at the time of engine rebuild would minimize the amount of time a vehicle is out-of-service, would offset any changes in fuel economy, and would achieve a higher compliance rate. It therefore seemed more reasonable to require the installation of the low NOx rebuild kits at the time of engine rebuild (particularly if hardware were involved), rather than to mandate a truck recall.

Since then, we have learned that software alone can fix the problem, engine manufacturers have reported negligible fuel economy differences, and the software installation rate under the Low NOx Rebuild Program has been very low. Accordingly, the ARB staff is proposing this regulation to ensure that we achieve the emission reductions expected in California under the Consent Decrees/Settlement Agreements. There is no reason to wait until rebuilds are performed, and each day of delay causes adverse health impacts that could be avoided. Thus, we are proposing this regulation to quickly reduce excess NOx emissions and protect public health.

G. RECOMMENDATION

1. What is the staff recommendation for Board action?

We recommend that the Board adopt new section 2011, title 13, California Code of Regulations, and amend the following sections to support the new section: 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194. The proposed new regulatory language and amendments are set forth in the Proposed Regulation Order in Appendix A.

II. BACKGROUND

A. HEAVY-DUTY DIESEL VEHICLES AND EMISSIONS

Under the ARB's existing program to control emissions from mobile sources, heavy-duty vehicles, regardless of fuel type, are defined as vehicles with gross vehicle weight ratings (GVWRs) greater than 14,000 pounds. The heavy-duty vehicle category, which is dominated by vehicles powered by diesel engines, includes vehicles such as dump trucks, solid waste collection vehicles, fuel cargo tankers, larger delivery trucks, urban buses, school buses, motor homes, and line haul trucks.

Diesel engines are compression ignited, which means that the fuel and air mixture is ignited by high pressure in the combustion chamber instead of by spark plugs as used in gasoline-fueled vehicles. Regulating the amount of fuel injected into the combustion chamber controls the power output. The primary pollutants of concern from diesel engines are NOx and particulate matter (PM). The high temperatures and excess air cause the nitrogen in the air to combine with available oxygen to form NOx. PM emissions result from fuel droplets that have not completely combusted.

In contrast to their high NOx and PM emissions, diesel engines in heavy-duty vehicles emit relatively low levels of carbon monoxide (CO), carbon dioxide (CO_2), and reactive organic gases (ROG). Nonetheless, these emission impacts are important due to the potential of CO to create "hot spots" that affect public health (although nearly all areas of California are in CO attainment), the role of CO_2 in global warming, and the reaction of ROG in the atmosphere to form ozone.

B. EMISSION STANDARDS

The federal Clean Air Act grants California the authority to adopt and enforce rules to control mobile source emissions within California – California is the only state in the nation with the authority to establish its own unique motor vehicle control program. In doing so, however, the ARB is required to adopt state requirements that are as stringent as, or more stringent than, the federal requirements.

Table 1 below presents the California heavy-duty diesel engine emission standards to which 1993-1998 model heavy-duty diesel engines, excluding urban bus engines, were originally required to certify using the Federal Test Procedure (FTP). The California emission standards were aligned with the federal emission standards for the model years shown.

Section IV of this staff report provides the emission limits that the low NOx software upgrades are designed to achieve. While the low NOx software upgrades

reduce off-cycle NOx emissions, they do not reduce NOx emissions to the levels that the engines were required to achieve at the time of original certification using the FTP.

Table 1 California Heavy-Duty Diesel Engine Emission Standards (for engines used in vehicles with GVWRs greater than 14,000 pounds, excluding urban bus engines) In grams per brake horsepower-hour (g/bhp-hr)					
Model Year	Carbon Monoxide	Non-methane Hydrocarbons	Total Hydrocarbons	PM	NOx
1991 - 1993	15.5	1.2	1.3	0.25	5.0
1994 - 1997	15.5	1.2	1.3	0.10	5.0
1998	15.5	1.2	1.3	0.10	4.0

C. EMISSIONS INVENTORY

The baseline statewide emissions inventory for all on-road heavy-duty diesel vehicles with GVWRs greater than 14,000 pounds is shown in Table 2 below. These emission estimates, based on the ARB's emission inventory modeling program, EMFAC2002 version 2.2, represent the emissions contribution of all heavy-duty diesel vehicles before the implementation of this regulatory proposal.

Table 2 Baseline Emissions for On-Road Heavy-Duty Diesel Vehicles > 14,000 lbs. GVWR (Statewide, Annual Average, tons per day)					
Pollutant	2000	2005	2010	2015	2020
ROG	28	27	23	18	16
NOx	741	673	524	346	239
PM10 (exhaust)	17	14	11	8	7
CO	135	123	108	94	88

III. NEED FOR CONTROL

The proposed software upgrade regulation is an important step in further reducing the human health and environmental impacts of NOx and ozone. This section summarizes the air quality rationale for the staff's proposal.

A. NOx

NOx is a combination of highly-reactive gases formed when fuel is burned at a high temperature. Combustion of fuel by motor vehicles is the most significant source of NOx production. NOx causes a wide variety of health and environmental problems through formation of ozone, toxic chemicals, and acid rain. This is of

particular concern for the San Joaquin Valley, which hosts at least two significant trucking corridors. Reacting with other compounds, NOx results in the secondary formation of PM in the form of nitrates. These atmospheric particles contribute to visibility impairment in both urban areas and national parks. NOx, and the ozone and fine particulate matter it forms, are especially damaging to children, contributing to slower lung growth and development and decreased lung functioning. Reducing NOx emissions is an essential component of California's strategy for cleaner air.

B. OZONE

Ozone is formed when NOx and volatile organic compounds react in the presence of sunlight and heat. California has a serious, statewide ozone problem and is home to the top four most ozone-polluted metropolitan areas (Los Angeles-Riverside-Orange County, Fresno, Bakersfield, and Visalia-Tulare-Porterville), as ranked by the American Lung Association in 2003. Ozone causes harmful health effects ranging from eye irritation, sore throats, and coughing, to lung damage, cancer, and premature death. Those who may be severely affected include children, the elderly, and individuals with compromised respiratory systems. Even healthy children and adults who play or exercise outdoors are also at risk. In addition to human health affects, ozone interferes with the ability of plants to produce and store food, and damages the foliage of trees and other plants. It is estimated that ozone is responsible for one to two billion dollars in reduced crop production in the United States each year.

C. STATE IMPLEMENTATION PLAN

The federal Clean Air Act requires each region that violates National Ambient Air Quality Standards (NAAQS) to develop a State Implementation Plan (SIP). The local, state, and federal strategies in the SIP must together reduce emissions by an amount sufficient to meet the NAAQS by a specified timeframe for a specific region. California's SIP is a collection of region-specific plans that detail how each area will meet the air quality standards. These plans include permitting and monitoring programs, local air district rules, state regulations, and federal controls. California has SIPs for meeting ozone, PM, and CO air quality standards for areas of nonattainment.

We have made significant progress in controlling ozone throughout California by reducing NOx and ROG emissions. Statewide exposure to unhealthful ozone concentrations has been cut in half since 1980. However, California still has areas that violate the one-hour federal ozone standard. In addition, most of California does not attain the more health-protective state and new federal standards for ozone. As such, additional reductions in NOx emissions are critical for achieving federal and state ozone standards.

The ARB is currently updating California's SIP and is working with local air districts and the U.S. EPA to develop, adopt, and implement strategies to reduce

emissions from all pollution sources in various regions in California. Once the SIP is approved, the strategies it contains become legally-binding commitments. The Board already approved one regional element of the California SIP on June 26, 2003 – the San Joaquin Valley PM10 SIP. On September 25, 2003, the Board is scheduled to consider the South Coast SIP. This regulatory proposal is a component of these two regional SIP elements. The reductions from this proposed regulation are critical to achieving the total emission reductions needed to meet our SIP commitments.

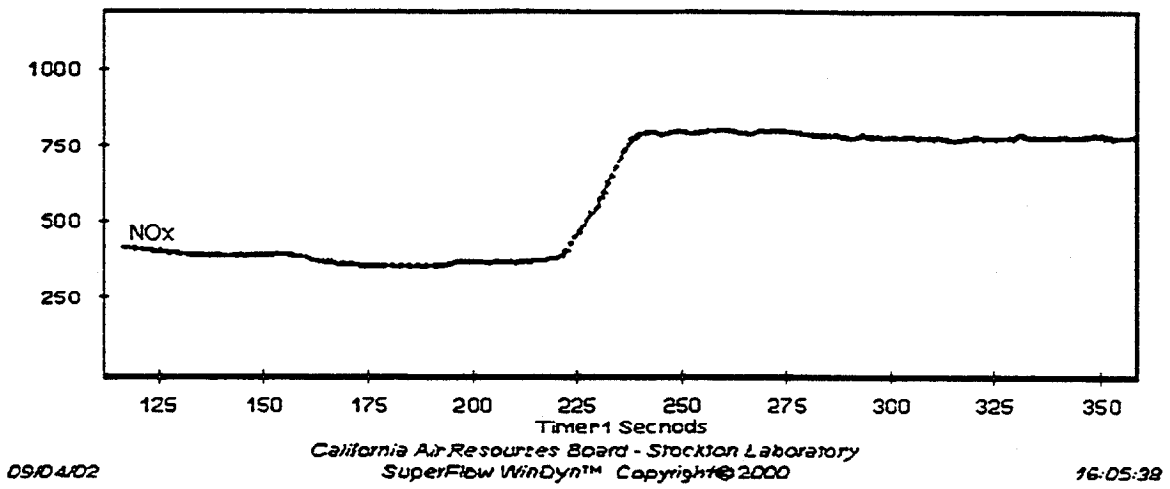
IV. NEED FOR THE PROPOSED REGULATIONS

A. OFF-CYCLE EMISSIONS

The U.S. EPA, the Department of Justice, and the ARB discovered that seven large manufacturers had, throughout the late 1980s and 1990s, designed engines with advanced computer controls that maximized fuel economy during certain typical periods of vehicle operation, such as long-haul driving. These computer-based strategies, utilized on engines in trucks, school buses, urban buses, and motor homes, allowed the engines to comply with emission limits when being tested on the FTP, but caused increased NOx emissions during highway driving. This type of programming is sometimes referred to as "dual mapping." The result was in-use NOx emissions significantly higher than the emission levels to which the engine was certified. We call these high NOx emissions "off-cycle" or excess NOx emissions. Over a million heavy-duty diesel engines manufactured over a period of nearly ten years emitted excess NOx emissions nationwide. Most continue to do so.

Figure 1 below demonstrates the representative increase in NOx emissions when an engine switches to off-cycle mode. Based on test data from the ARB's Stockton Inspection and Maintenance Development Laboratory, Figure 1 shows that after about 220 seconds of engine operation in a steady state mode typical of on-highway driving, the engine's alternative control map program begins operation resulting in an approximate doubling of NOx emissions. These increased NOx emissions are emitted from almost 100,000 California-registered vehicles driving on the road everyday. An additional 300,000 to 400,000 affected 1993-1999 model year vehicles travel in California from out-of-state emitting increased NOx emissions from the off-cycle engine mode.

Figure 1
Graph of Off-Cycle NOx Emissions
PPM (concentration) vs. Time



B. CONSENT DECREES AND SETTLEMENT AGREEMENTS

The federal Consent Decrees and the California-specific Settlement Agreements are legally-binding agreements with the affected engine manufacturers. These agreements require the engine manufacturers to partially mitigate off-cycle NOx emissions from existing engines and to take corrective action to ensure that future new engines do not produce off-cycle NOx emissions. In addition to the low NOx rebuild requirements discussed below, other key provisions of the Consent Decrees/Settlement Agreements are: 1) the requirement for the majority of affected engine manufacturers to begin producing engines meeting the NOx plus non-methane hydrocarbons (NMHC) emission standard for 2004 and later model year engines by October 1, 2002 – over one year ahead of when originally required by the U.S. EPA and the ARB; and 2) the requirement for affected engine manufacturers to certify engines by October 1, 2002, using supplemental certification procedures known as the Not-To-Exceed (NTE) test and the EURO III European Stationary Cycle (ESC) test, in addition to the FTP. A brief discussion of the supplemental test procedures (the NTE and the ESC) is presented in the next section.

C. LOW NOx REBUILD REQUIREMENTS

1. Emissions Limits

The affected engine manufacturers agreed to reduce NOx emissions from pre-settlement engines through certain software and/or minor hardware changes made to the engines through the use of low NOx rebuild kits. The manufacturers[1] were given two emission-limit options as shown in Table 3 below. Option B has higher emission limits than Option A, but includes an additional model year of engines. A generic version of the Low NOx Rebuild Program language is contained in Appendix B to this staff report. Appendix B is intended to help clarify the Low NOx Rebuild Program requirements. Appendix B, however, is not a legal document and is not intended to represent the minor manufacturer-specific requirements in the individual Consent Decrees/Settlement Agreements.

Table 3
Low NOx Rebuild Requirements

Option A (1994 – 1998)			Option B (1993 – 1998)		
	MHDDE	HHDDE		MHDDE	HHDDE
Euro III (ESC)	6.0 g/bhp-hr	7.0 g/bhp-hr	Euro III (ESC)	6.5 g/bhp-hr	7.5 g/bhp-hr
NTE	7.5 g/bhp-hr	8.75 g/bhp-hr	NTE	8.1 g/bhp-hr	9.38 g/bhp-hr

Upon rebuild of any engine in an engine family specified in the Consent Decrees/Settlement Agreements, the low NOx rebuild kit is to be installed at no additional cost to the vehicle owner. The Consent Decrees/Settlement Agreements indicate that the low NOx rebuild kit is to be installed on engines being rebuilt with accumulated mileage greater than 290,000 miles on a heavy heavy-duty diesel engine (HHDDE) and greater than 185,000 on a medium heavy-duty diesel engine (MHDDE). HHDDEs are used in vehicles with GVWRs greater than 33,000 pounds, while MHDDEs are used in vehicles with GVWRs of 14,001-33,000 pounds. The Consent Decrees/Settlement Agreements also stipulate that low NOx rebuild kits are to be installed on engines with less than the specified mileage where the service event includes replacement or reconditioning of more than one major cylinder component in all of the engine's cylinders. Finally, the affected engine manufacturers must make low NOx rebuild kits available to anyone that requests one.

The Consent Decrees/Settlement Agreements also subject urban bus engines to the low NOx rebuild requirements due to off-cycle emissions. However, the Consent Decrees/Settlement Agreements contain provisions allowing manufacturers to exclude engines manufactured at a low volume from the low NOx rebuild

[1] Except Navistar – For Navistar/International, the low NOx rebuild only applies to 1998 model year engines without stipulated NOx limits

requirements. The two manufacturers of urban bus engines, Detroit Diesel Corporation and Cummins, have used the low volume exemption for their urban bus engines. As a result, no low NOx rebuild kits are available for urban buses. In estimating the emission benefits of this proposal, we did not include any emission reductions from the urban bus engine category.

2. Engine Rebuild Practices

An engine rebuild generally involves the disassembly of the engine to a point where high wear components are checked and measured against the Original Equipment Manufacturer specifications, replaced or reconditioned as necessary, and reassembled. The components that are checked during the rebuild process are engine bearings, piston rings, rod, valves and springs, and gaskets and seals. An "in-frame" rebuild is carried out when the engine is still in the vehicle, while an "out-of-frame" rebuild takes place after the engine is removed from vehicle. The difference between these two rebuilds lies in the thoroughness of the service. In addition to replacing the same parts as an in-frame rebuild, an out-of-frame rebuild may replace the camshaft bearing, turbocharger, and other fuel system components, such as fuel injectors and the fuel injection pump, that are inaccessible during in-frame maintenance.

Under the Consent Decrees/Settlement Agreements, low NOx software is to be installed upon engine rebuild, or when otherwise requested (e.g., at other service events). At the time of negotiations for the Consent Decrees and the Settlement Agreements, the prevailing assumption was that engine rebuilds were occurring at mileage intervals of about 300,000 to 400,000 miles. Nowadays, heavy-duty diesel engines are performing well for longer periods of time and engine rebuilds occur closer to when the engine has accumulated 750,000 to 1,000,000 miles. While engine manufacturers have complied with the provisions of the Low NOx Rebuild Program requiring them to develop low NOx rebuild kits (i.e., software upgrades), rebuilds are not occurring as expected and only a small percentage (about four to ten percent) of eligible engines have had the software upgrades installed. As such, the Low NOx Rebuild Program is not achieving its expected emission benefits.

It is important to note that while the Consent Decrees/Settlement Agreements contain mileage accumulation thresholds for installation of the software upgrades upon rebuild, there are no regulatory requirements mandating engine rebuilds at specific mileage intervals or that they be performed at all. The decision to perform an engine rebuild is mostly an economic decision on the part of the vehicle owner and it is generally performed only when other maintenance will not correct such problems as increased oil consumption, loss of performance, poor fuel economy, or engine failure.

3. Engine Certification Test Procedures

Prior to the implementation of the Consent Decrees/Settlement Agreements, new heavy-duty engines were certified to applicable emission standards based on compliance with a standardized laboratory test method known as the FTP. The FTP mimics the light loads and low speeds typical of urban driving. The high speed, high load operating conditions typical of on-highway heavy-duty trucks, or other heavy-duty vehicles operating in a steady-state mode, are not well represented on the FTP.

Due to the limitations of the FTP in capturing a heavy-duty engine's emission levels over a range of simulated driving conditions, the Consent Decrees/Settlement Agreements included provisions requiring compliance with the supplemental test procedures (the NTE and ESC) by October 1, 2002. The supplemental test procedures are more representative of typical on-highway driving conditions than the FTP and will help ensure that future new engines do not continue to emit off-cycle NOx. Recognizing the effectiveness of the NTE and the ESC in testing heavy-duty engine emission levels over the majority of real world driving conditions, both the U.S. EPA and the ARB have adopted rules requiring the use of the supplemental test procedures, in addition to the FTP, for new engine certification. While the U.S. EPA requirements do not become effective until the 2007 model year for federally-certified engines, engines produced for sale in California must be certified using the supplemental test procedures, in addition to the FTP, beginning with the 2005 model year (except for urban bus engines, which are not required to submit to testing under the supplemental procedures until the 2007 model year).

Because of their ability to mimic more real world driving conditions, the supplemental test procedures are also the basis for the emission limits contained in the Low NOx Rebuild Program. The low NOx software upgrades are designed to meet specified emission limits on the NTE and ESC tests and will reduce off-cycle NOx emissions from existing engines. However, the software upgrades will not reduce NOx emissions to the levels that the engines were required to achieve at the time of original certification using the FTP. Neither the Low NOx Rebuild Program nor this regulatory proposal contain requirements for in-use testing to verify emission levels.

D. POTENTIAL CONCERNS ABOUT LOW NOx SOFTWARE INSTALLATION

The Consent Decrees/Settlements Agreements require the affected engine manufacturers to report the impact of low NOx software on fuel consumption, driveability, and safety. According to the manufacturers, there are negligible impacts on fuel economy and no detected impacts on driveability and safety.

Not only have the manufacturers reported negligible fuel economy differences, several fleets have had the low NOx software installed prior to rebuild and have also

reported no noticeable differences in their fuel use. However, there is a potential for a minor fuel economy penalty. We expect the average fuel economy penalty, if any, to be below one percent.

Nationwide, approximately 90,000 vehicles have already had the low NOx software installed. While this represents a small percentage of the total vehicles nationwide for which low NOx software upgrades are available, it is still a significant number of vehicles. We are not aware of any truck owner/operator complaints regarding significant changes in fuel economy or performance as a result of the installation of the low NOx software.

Another concern is the potential for the engine's ECM to stop working. Based on limited data provided to us by distributors, we estimate the current ECM failure rate at the time of low NOx software upgrade to be less than one percent. Replacing a failed ECM can cost $1500 or more. If the ECM fails at time of software installation, the truck owner/operator would naturally assume the failure was related to the software installation. Although the Consent Decrees/Settlement Agreements are silent on ECM failure, we believe the manufacturers should assume some responsibility for their functioning. However, apportioning financial responsibility for failure of ECMs, many of which are now out of warranty, is ultimately between the customer and the dealer or distributor performing the service. We will continue to evaluate reported incidences of ECM failure.

V. PROPOSED REQUIREMENTS

We are proposing to reduce NOx emissions by requiring owners and operators of trucks, school buses, and motor homes with 1993-1998 model year heavy-duty diesel engines to upgrade the software in the ECM of these engines. Software upgrades have been developed by the engine manufacturers and are available now for affected 1993-1998 model year engines, which are used in 1993-1999 model year vehicles.

The affected engine manufacturers agreed to reduce NOx emissions from existing engines through certain software and/or hardware changes made to the engine. However, all low NOx rebuild kits developed by the engine manufacturers include only software changes; they do not include any hardware changes to the engine. Therefore, the installation of low NOx software does not involve a significant modification to the engine. The low NOx software installation is not restricted to times of regularly scheduled major maintenance or engine rebuild and may therefore be installed during other service events.

The following sections discuss the major provisions of the proposed regulation.

A. APPLICABILITY

The requirements to install low NOx software apply to owners of eligible 1993-1999 model year vehicles and to engine dealers and distributors. Eligible vehicles are those equipped with 1993-1998 model year engines for which low NOx software is available. A list of the engines with low NOx software available is in Appendix C of this staff report. The requirements apply to all eligible vehicles operating in California whether registered in California or elsewhere.

B. LOW NOx SOFTWARE LABEL

Our proposal requires that a label be affixed to each engine upon installation of the low NOx software. The proposed label requirements mirror those in the Consent Decrees/Settlement Agreements. Therefore, the same label that has been used for compliance with the Low NOx Rebuild Program under the Consent Decrees/ Settlement Agreements may be used for compliance with this regulation.

The label is to include an identifiable characteristic that indicates that the engine has low NOx software, a place for the date of installation, and the name of the individual who performed the installation. The label material is to be suitable for the location and fabricated so that the label cannot be removed intact. Finally, the placement of the label is to be consistent with California law.

C. EXEMPTIONS

For California-registered school buses, the initial $300 penalty for failing to install the low NOx software by the appropriate compliance date would be waived if the software were installed within 45 days of issuance of a citation. However, if the software were not installed until after 45 days, both the $300 penalty and the additional $500 penalty would apply.

D. IMPLEMENTATION SCHEDULE

As proposed by the ARB staff, the low NOx software upgrades must be installed between April and December 2004, depending on the model year of the applicable engine. Our proposal is as follows:

1993-1994 model years	By April 30, 2004
1995-1996 model years	By August 31, 2004
1997-1998 model years	By December 31, 2004

E. ENFORCEMENT

Installations of the low NOx software would be verified by ARB enforcement staff through the existing Heavy-Duty Vehicle Inspection Program (HDVIP) and the

Periodic Smoke Inspection Program (PSIP). In the HDVIP, the ARB staff already inspects heavy-duty vehicles at California Highway Patrol (CHP) weigh stations, randomly selected roadside locations, and fleet facilities for excessive smoke and tampering. The PSIP requires fleet operators to self-inspect their vehicles and to repair those exceeding smoke opacity limits.

When implemented, we expect that existing enforcement staff will be targeting enforcement of this regulation during its first two or three years to ensure that the low NOx software upgrades are indeed occurring as required. Due to the near-term compliance dates of this proposal, we do not anticipate that significant on-going staff resources will be required to target enforcement of this regulation in the long-term.

As part of this proposal to require the installation of the low NOx software, we are also proposing to amend the HDVIP to include an evaluation of both in-state and out-of-state vehicles to verify that the correct low NOx software has been installed on each applicable heady-duty diesel vehicle. This evaluation will be performed using a scan tool provided by each engine manufacturer. Out-of-state vehicles will not be subject to any fleet facility inspections. This proposal also includes amendments to the PSIP that require fleets subject to the PSIP to demonstrate installation of the applicable low NOx software through record keeping requirements. Failure to have the low NOx software installed by the compliance dates shown above would result in a citation accompanied by the monetary penalties described below.

F. PENALTIES

Under the proposed regulation, the penalty for failing to install the low NOx software by the specified compliance dates would be $300 if the low NOx software were installed within 45 days of issuance of a citation. If the software were not installed until after 45 days of issuance of a citation, there would be an additional $500 penalty. The proposed penalties for the failure to install the low NOx software apply to both California-registered vehicles and out-of-state registered vehicles, and would be in addition to any penalties incurred in the HDVIP for excessive smoke and tampering. However, the $300 penalty would be waived for California-registered school buses if the low NOx software were installed within 45 days of issuance of a citation. If the software were not installed until after 45 days, both the $300 penalty and the additional $500 penalty would apply.

G. RECORDKEEPING

The proposed regulation requires vehicle owners and operators to record certain information associated with the low NOx software upgrade upon installation. This information, which is necessary to demonstrate the installation of the low NOx software for each applicable engine, includes: 1) the name, address, and phone number of the facility performing the installation; 2) the name of the person performing the installation; 3) the date of the installation; and 4) a description of the

eligible engine, including the engine family name and number, and the low NOx software installed. This information is likely to be contained on a repair receipt or completed work order. The records required to demonstrate the installation of the low NOx software are important for ensuring that the NOx reductions are achieved and that public health is protected.

VI. REGULATORY ALTERNATIVES

A. DO NOT AMEND CURRENT CALIFORNIA REGULATIONS

One alternative we considered was not going forward with this regulatory proposal. In this case, low NOx software installations would only occur under the existing provisions of the Low NOx Rebuild Program, if at all. As already discussed, the software upgrades are not occurring as anticipated and thus the Low NOx Rebuild Program is not achieving significant emission reductions in a timely manner.

We rejected this alternative because we have proposed SIP commitments to obtain the potential NOx reductions achieved by installing low NOx software. Not implementing this proposal will slow California's progress in attaining the federal NAAQS. Installing low NOx software is critical to reducing off-cycle NOx emissions to the maximum extent possible right now and to achieving our SIP emission reduction targets.

B. INSTITUTE SOFTWARE UPGRADE ON A VOLUNTARY BASIS

The engine manufacturers encouraged implementing a voluntary program to install the low NOx software. Two of the affected engine manufacturers have offset projects or supplemental emissions projects that provide incentives to vehicle owners to install the low NOx software prior to engine rebuild. Even with these incentives available, the number of engines that have the low NOx software installed has remained very low. An improvement over the current situation might be realized with the addition of incentive money provided by the state. We estimate that up to 15 percent of the fleet could be captured with a 300 dollar per vehicle incentive at a cost to the state of up to 5 million dollars. The associated emission reductions are estimated to be zero to six tons per day of NOx.

We did not pursue this alternative for a couple of reasons. The first reason that staff rejected this approach is because the engine manufacturers have a responsibility to mitigate the off-cycle NOx emissions caused by the "computer-based strategies" they programmed into their engines. But more importantly, only nominal NOx reductions could be achieved, thus hindering our ability to meet our SIP emission reduction targets.

C. REQUIRE LOW NOx SOFTWARE TO BE DEVELOPED FOR ALL 1993-1998 MODEL YEAR ENGINES

Low NOx software has not been developed for every 1993-1998 model year heavy-duty engine manufactured by the affected engine manufacturers. Under the Consent Decrees/Settlement Agreements, the manufacturers were given two options for developing the low NOx software. In one option, software for 1994-1998 model year engines has been developed and the NOx emission allowance is slightly lower than in the other option. In the other option, software for 1993-1998 model year engines has been developed and the NOx emission allowance is slightly higher. Since some manufacturers chose the option to develop low NOx software for only the 1994-1998 engines, that means there is no low NOx software for the 1993 engines manufactured by those companies. In addition to the two options for developing the low NOx software, the engine manufacturers were not required to develop low NOx software for engines manufactured in low volumes.

We considered proposing a regulation to require that additional low NOx software be developed for the 1993 model year engines and the low-volume engines that do not currently have low NOx software available. We rejected this alternative because of the time and effort necessary to develop the new software for the relatively few number of vehicles not captured by this regulatory proposal.

D. SUMMARY

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. OUTREACH AND STATUTUORY AUTHORITY

A. OUTREACH

We conducted workshops on February 24, 2003, and June 25, 2003, to introduce the regulatory proposal concept and then later to describe some of the specifics as the proposal was being further developed. The public was notified of these meetings via notices sent by mail to interested parties on certain ARB mailing lists and via e-mail notification stating that the workshop notice had been posted on the ARB web site.

Interested parties notified via mail included air pollution control officers throughout California, members of environmental organizations, parties interested in heavy-duty vehicle programs, such as the Heavy-Duty Vehicle Inspection Program, school bus program affiliates, and environmental justice affiliates. Because the regulatory proposal affects engine dealers/distributors, we made a concerted effort

to develop a mailing list to include them. At the same time, we created a new e-mail list serve to service anyone with an e-mail address.

After the first workshop, as our regulatory proposal development progressed, we became concerned that individuals who owned vehicles with 1993-1998 model year heavy-duty diesel engines had not been adequately engaged in the public process. We developed a letter directed to the largest number of 1993-1998 model year heavy-duty diesel engine owners. This letter was directed at over 40,000 owners/operators of 1993-1998 model year trucks registered in California. This letter was attached to the second workshop notice and sent to both the interested parties already mentioned and to the truck owners/operators whose addresses were gleaned from a DMV database.

During the regulatory proposal development, face-to-face meetings were held with the affected engine manufacturers. Telephone conversations have been conducted with trucking associations (both state and national associations), with engine manufacturer representatives, with engine dealers/distributors, and with truck owners/operators. Preliminary workshop notices were shared with the California Trucking Association and the American Trucking Association. Workshop notices were also mailed to trucking associations in the three states contiguous with California – Oregon, Nevada, and Arizona. The ARB has been proactive and thorough in the outreach efforts for the Heavy-Duty Diesel Engine Software Upgrade regulatory proposal.

Prior to the enforcement dates, the ARB staff will make a dedicated effort to inform affected truck owners/operators of this proposed regulation, should the Board adopt it. Our outreach will include mailing notices through Department of Motor Vehicles (DMV) records, distributing informational notices at HDVIP inspection points, posting informational notices at truck stops, and working with dealers and trucking associations to further disseminate information.

B. STATUTORY AUTHORITY

Sections 39600 and 39601 of the Health and Safety Code authorize the ARB 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. In section 43000 of the Health and Safety Code, the Legislature has declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the state. In sections 39002 and 39003 of the Health and Safety Code, the Legislature has charged the Board with the responsibility of systematically addressing the serious air pollution problem caused by motor vehicles. Another section, Health and Safety Code Section 43013, and specifically subsection (h) therein, directs the Board to adopt standards to reduce air contaminants from vehicular sources, including NOx emissions from diesel vehicles. Also, Health and Safety Code Section 43018 directs the Board to endeavor to achieve the maximum degree of emission reduction possible from vehicular sources

to accomplish the attainment of state ambient air quality standards by the earliest practicable date. Finally, section 43701(b) of the Health and Safety Code requires the Board to adopt regulations that require heavy-duty diesel vehicles to utilize emission control equipment and alternative fuels to reduce emissions to the greatest extent feasible.

C. NOTICE OF DISPUTE

Six of the seven affected engine manufacturers have sent the ARB a jointly-signed letter (dated August 22, 2003) claiming that requiring installation of low NOx rebuild kits before the time of normal engine rebuild would breach Settlement Agreements between those manufacturers and the ARB. By sending the ARB this letter, the engine manufacturers have initiated the dispute resolution process that begins with attempts to resolve this issue through informal negotiations. Only after informal negotiations have failed would this issue be submitted for formal mediation. These potential negotiations and mediation, which may occur concurrently with this regulatory proposal, may or may not lead to a resolution of the dispute before the Board considers this regulatory proposal. The ARB believes that the Consent Decrees/Settlement Agreements do not preclude the ARB from using its regulatory powers to require the installation of low NOx software before the time of normal engine rebuild.

VIII. ENVIRONMENTAL IMPACTS AND COST-EFFECTIVENESS

A. EMISSION BENEFITS OF PROPOSED REGULATION

Table 4
Estimated Statewide NOx Reductions from Software Upgrade
Calendar Year 2005, tons per day

California-Registered Vehicles	Out-of-State Registered Vehicles Operating in California	Total
30-40	6-9	36-49

Table 4 above presents the estimated emission benefits of this regulatory proposal. The estimated statewide NOx reductions in 2005 are 30 to 40 tons per day from California-registered vehicles. The estimated reductions from out-of-state vehicles traveling in California in 2005 are estimated to be an additional 6 to 9 tons per day of NOx, for total reductions of 36 to 49 tons per day. Out-of-state vehicles account for about 25 percent of the heavy heavy-duty diesel truck (trucks with GVWRs greater than 33,000 pounds) mileage and emissions in the California emissions inventory.

1. Calculation of Emission Reductions

The estimated emission reductions are based on vehicle miles traveled, confidential Consent Decree data on engine manufacturer market share, engine time

in off-cycle mode and engine emissions level in off-cycle mode, as well as estimated emissions levels after software upgrade.

In estimating emission reductions, we corrected for a number of factors: the applicable model years for each manufacturer, the number of vehicles that have already received the software upgrade, the manufacturers' low volume exemption, and the differences between calculated NOx emissions and modeled NOx emissions. The range of estimated benefits reflects the uncertainty in those corrections.

2. South Coast SIP Emission Reductions

The estimated NOx emission reductions in the South Coast Air Basin in 2010 as a result of this proposed regulation are 8 to 10 tons per day. These reductions are SIP creditable (included in the inventory and therefore can count towards SIP commitments) emission reductions from California-registered vehicles. However, due to the uncertainty in the number of 1993-1999 model year vehicles that would still be involved in interstate commerce in 2010, no reductions from out-of-state vehicles are included in the estimated NOx benefits for the South Coast region.

B. COST-EFFECTIVENESS

The proposed software upgrade regulation is very cost-effective at less than $100 per ton of NOx reduced and compares favorably with the cost-effectiveness of other ARB mobile source regulations. The cost-effectiveness value assumes no labor costs are incurred by vehicle owners for the software installation because the engine manufacturers are required to cover these costs under the Consent Decrees/Settlement Agreements.

IX. ECONOMIC IMPACTS

A. LEGAL REQUIREMENT

Sections 11346.3 and 11346.5 of the Government Code require 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 school districts. The estimate is to include any non-discretionary cost or savings to local agencies and the cost or savings in federal funding to the state.

B. AFFECTED BUSINESSES

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons or businesses. There may be as many as 40,000 businesses, up to 3000 school districts, and over 5000 motor home owners that operate vehicles powered with 1993-1998 model year heavy-duty diesel engines affected by this proposal. Also affected are approximately 100 dealers/distributors for Caterpillar, Cummins, Detroit Diesel, Mack/Renault, International (Navistar), and Volvo that have the capability to install low NOx software into an eligible engine's ECM. Finally, this proposal will also affect the seven engine manufacturers mentioned already – each of which is located outside of California. The total statewide costs that businesses and individuals may incur to comply with this regulation over its lifetime are up to eight million dollars.

1. Number of California-registered vehicles

There are about 100,000 heavy-duty diesel vehicles with 1993 through 1998 model year diesel engines registered in California. That total is based on 2002 DMV registration records. It excludes urban buses, for which the applicable engine manufacturers have used their low volume exemptions from the provisions of the Low NOx Rebuild Program.

After sorting DMV registrations to account for the companies that own multiple trucks, we believe that there are approximately 40,000 companies that own heavy-duty diesel vehicles affected by this proposal and 100 heavy truck dealers/distributors in California.

2. Number of out-of-state vehicles

We estimate 300,000 to 400,000 out-of-state registered vehicles will visit California and would be subject to the regulation. This is based on DMV- reported 1.37 million International Registration Program (IRP) vehicles that visited California in 2002 (DMV, 2003). Of the California-registered vehicles, about 29 percent have 1993-1998 model year engines. We would expect trucks used in interstate commerce to be somewhat newer than the general truck population. Therefore, our estimate assumes that about 22 percent to 29 percent of out-of-state registered vehicles visiting California would be subject to the regulation.

While our legal obligation is to assess the potential for adverse economic impacts on California business enterprises and individuals, we also want to acknowledge the potential impact on enterprises and individuals outside of California. Because we want to promote a level playing field for California businesses, we are also requiring 1993-1999 model year trucks, buses, and motor homes registered out-of-state to comply with this regulatory proposal, when implemented.

C. POTENTIAL COSTS TO VEHICLE OWNERS OR OPERATORS

Because the engine manufacturers are required to pay for the installation costs of the software upgrade under the provisions of the Consent Decrees/Settlement Agreements, the only costs to the vehicle owners or operators should be the time that the vehicle is out-of-service. We have estimated two hours as the average time out-of-service. This estimate allows for time to: 1) drive the truck to the dealer/distributor facility; 2) to install the low NOx software; and 3) to return the truck to service. An appointment is essential to minimize the wait time for the low NOx software installation. We have estimated the dollar amount for vehicle time out-of-service at one hundred dollars per vehicle. This cost can be reduced to next to nothing if the low NOx software is installed at the same time as other service or repair is performed on the vehicle.

In the event that the engine manufacturers refuse to provide reimbursement to their dealers/distributors, the cost to the vehicle owner or operator may include half an hour to one hour of labor at a minimum. The ARB is pressing the engine manufacturers to meet their obligations so that no labor costs are incurred by vehicle owners or operators.

D. POTENTIAL COSTS TO ENGINE DEALERS/DISTRIBUTORS

There should be no cost to the dealers/distributors whether the engine manufacturers reimburse them or they charge the vehicle owner/operator. Under the Consent Decrees/Settlement Agreements, the low NOx software is to be provided free of charge to anyone that requests it. Engine manufacturers have provided dealers/distributors with codes to use for billing the manufacturers for costs associated with low NOx software installations at the time of rebuild. We believe that the engine manufacturers should allow use of these reimbursement codes for low NOx software installation prior to rebuild.

At the time of this writing, the actions of the engine manufacturers have created uncertainty among engine dealers/distributors. Some dealers/distributors have stated that they do not have reimbursement codes from the engine manufacturers to cover their labor costs for installing low NOx software prior to an engine rebuild. Other dealers believe that they are to install the low NOx software for anyone that asks and that the engine manufacturer will reimburse them for their labor. Some dealers are charging both for labor and the low NOx software when installed before rebuild. Other dealers are providing the software at no charge, but charge for labor. We expect to resolve these differences in reimbursement practices by working with the engine manufacturers and the engine dealers/distributors prior to implementation of this proposal, if adopted by the Board.

E. POTENTIAL COSTS TO ENGINE MANUFACTURERS

Costs to engine manufacturers are not increased beyond their costs to comply with the Consent Decrees/Settlement Agreements. Engine manufacturers have a responsibility to mitigate the excess NOx emissions caused by the "computer-based strategies" they programmed into their engines. The ARB staff believes the applicable Consent Decrees/Settlement Agreements require manufacturers to supply the Low NOx software at no added cost whenever it is requested.

Engine manufacturers may see this proposal as an acceleration of the requirements under the Consent Decrees/Settlement Agreements with the possibility of increasing their costs of reimbursing engine dealers/distributors for labor. We believe that most 1993-1998 model year engines should have been rebuilt and had the low NOx software installed by now, and therefore this cost is illusory.

Some engine manufacturers are already providing the software free of charge to anyone that requests it. Unfortunately, some engine manufacturers are not installing the low NOx software free of charge unless it is installed in conjunction with an engine rebuild. The ARB is pressing the engine manufacturers to meet their obligations so that dealers are reimbursed and vehicle operators and owners incur no costs.

F. POTENTIAL COSTS TO STATE AND LOCAL AGENCIES

The proposed requirements are not expected to result in an increase in costs for state and local agencies. We recognize that some state and local agencies, particularly school districts, may have 1993-1999 model year vehicles affected by the proposed requirements. We expect state and local agencies would eliminate any time out-of-service costs associated with complying with the proposed requirements by scheduling low NOx software installation at the same time as other scheduled maintenance. We expect state and local agencies, in many cases, have regular maintenance scheduled. School buses, for example, are inspected annually by the California Highway Patrol, and thus would need to be well-maintained

X. ENVIRONMENTAL JUSTICE

The ARB is committed to integrating environmental justice in all its activities. On December 13, 2001, the Board approved its Environmental Justice Policies and Actions, which formally established a framework for incorporating environmental justice into the ARB's programs, consistent with the directives of state law. Environmental justice is defined as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. While this practice applies to all communities, our Environmental Justice Policies and Actions assist us

in implementing regulations and programs that can provide direct benefits to communities disproportionately impacted by pollution.

Our Environmental Justice Policies and Actions are intended to promote the fair treatment of all residents in California and to cover the full spectrum of ARB activities. Underlying the Board's environmental justice policies is the recognition that we need to engage community members in a meaningful way as we carry out our activities. People should have the best possible information about the air they breathe and what is being done to reduce unhealthful air pollution in their communities. The ARB recognizes its obligation to work closely with all stakeholders; communities, environmental and public health organizations, industry, business owners, other agencies, and all other interested parties to successfully implement the environmental justice policies.

This regulation, when adopted, will provide immediate air quality benefits by reducing NOx emissions from the wide variety of older heavy-duty diesel vehicles, many of which operate in neighborhoods (for example, school buses) and in mixed-use communities (residential/commercial/industrial areas). Reducing emissions from heavy-duty diesel vehicles will aid in our efforts to protect the health and safety of residents and workers in these areas.

XI. SUMMARY AND STAFF RECOMMENDATION

A. SUMMARY OF STAFF'S PROPOSAL

As presented in the previous sections, the staff proposal is designed to provide significant reductions of NOx emissions through low NOx software upgrades to most 1993-1998 model year heavy-duty diesel engines. The staff's proposal includes the following:

- Owners of 1993-1999 model year trucks, school buses, and motor homes with 1993-1998 model year heavy-duty diesel engines would be required to upgrade the software in their engines' ECM.
- The low NOx software shall be installed by April 30, 2004 (for 1993-1994 model year engines), by August 31, 2004 (for 1995-1996 model year engines), and by December 31, 2004 (for 1997-1998 model year engines).
- The penalty for non-compliance would be $300 if the upgraded software were installed within 45 days of issuance of a citation, and an additional $500 penalty if the software were not installed until after 45 days of issuance of a citation. Owners of California-registered school buses would have a waiver of the $300 penalty, if the upgrade were performed within the required 45 days.
- The requirement would apply to all applicable engines, including those used in heavy-duty diesel vehicles registered out-of-state.

B. STAFF RECOMMENDATION

The ARB staff recommends that the Board adopt a new section 2011, title 13, California Code of Regulations and amend sections 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194, title 13, California Code of Regulations. The regulation is set forth in the Proposed Regulation Order in Appendix A.

XII. REFERENCES

American Lung Association, 2003. State of the Air: 2003. http://www.lungaction.org/reports/sota03_full.html.

ARB, 1998. Proposed Amendments to Heavy-Duty Vehicle Regulations: 2004 Emission Standards; Averaging, Banking And Trading; Optional Reduced Emission Standards; Certification Test Fuel; Labeling; Maintenance Requirements And Warranties, March 6, 1998.

ARB, 2003. Proposed 2003 State and Federal Strategies for the California State Implementation Plan, May 2003.

DMV, 2003. Telephone conversation Francine Davies, Department of Motor Vehicles, on July 8, 2003.

U.S. EPA, 1995. Heavy-Duty Engine Rebuilding Practices, March 21, 1995.

U.S. EPA, 2000. Notice of Final Rulemaking, Control of Emissions of Air Pollution From 2004 and Later Model Year Heavy-Duty Highway Engines and Vehicles; Revision of Light-Duty On-Board Diagnostics Requirements, Signed by Carol Browner, United States Environmental Protection Agency Administrator, July 31, 2000; 65 Federal Register 59896, October 6, 2000.

APPENDIX A

PROPOSED REGULATION ORDER

PROPOSED REGULATION ORDER

Add the following section of title 13, California Code of Regulations, to read as set forth on the following pages:

Section 2011	Software Upgrade for 1993 through 1998 Model Heavy-Duty Trucks

Amend the following sections of title 13, California Code of Regulations, to read as set forth on the following pages:

Section 2180.1	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Definitions
Section 2181	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Responsibilities of the Driver and Inspector During the Inspection Procedure
Section 2184	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Refusal to Submit to Inspection Procedure
Section 2185	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Civil Penalty Schedule
Section 2186	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Demonstration of Correction and Post-Repair Test or Inspection
Section 2192	Periodic Smoke Inspections of Heavy-Duty Diesel-Powered Vehicles, Vehicle Inspection Responsibilities
Section 2194	Periodic Smoke Inspections of Heavy-Duty Diesel-Powered Vehicles, Record Keeping Requirements

Note: The proposed regulatory amendments are shown in underline to indicate additions to the text and ~~strikeout~~ to indicate deletions.

Adopt new section 2011, in new Article 3.5 – Installation of Motor Vehicle Pollution Control Devices (Heavy Duty Motor Vehicles), title 13, California Code of Regulations to read as follows:
(Note: the entire text of section 2011 as set forth below is new language proposed to be added to the California Code of Regulations.)

§ 2011. Software Upgrade for 1993 through 1998 Model Year Heavy-Duty Trucks.

(a) Applicability. This section 2011 applies to Low NOx Rebuild Engines, as defined, operating in the State of California.

(b) Definitions. The definitions in section 1900 (b), Chapter 1, title 13 of the California Code of Regulations apply, with the following additions:

(1) "Low NOx Rebuild Kit" means a software and/or minor hardware upgrade that results in lower emissions of oxides of nitrogen (NOx) when installed on the engine control module of heavy-duty diesel engines requiring such kits. Such engines are identified in plans implementing a Low NOx Rebuild Program under both Heavy Duty Diesel Engine Settlement Agreements with California and Consent Decrees with the United States Environmental Protection Agency, and are listed in (b)(2). The California Settlement Agreements and federal Consent Decrees are identified in title 13, California Code of Regulations, section 1956.8 (a)(2)(A), footnote 1.

(2) "Low NOx Rebuild Engine" means a 1993 through 1998 model year heavy-duty diesel engine for which a Low NOx Rebuild Kit must be available for installation. The complete list of Low NOx Rebuild Engines is:

Low NOx Rebuild Engines		
Make and Year	**Engine Model**	**Notes**
Caterpillar 1993 – 1998	3406E	Engine Serial Number (ESN) 5EK05767 and up
Caterpillar 1993 – 1998	3406E	ESN: 6TS00097 and up
Caterpillar 1993 – 1998	3406E	ESN: 1LW00001 through 1LW33262
Caterpillar 1993 – 1998	3406E	ESN: Reman 4AS00001 through 4AS00385
Caterpillar 1993 – 1998	3126	ESN: 1WM00210 through 1WM26819
Caterpillar 1993 – 1998	3126	ESN: 4ES000226 through 4ES00454
Caterpillar 1993 – 1998	3126	ESN: Reman 6RW00001 and up
Caterpillar 1993 – 1998	3126B	ESN: 7AS00001 through 7AS37588
Caterpillar 1993 – 1998	3116	ESN: 8WL00297 through 8WL07351
Caterpillar 1993 – 1998	3176B	ESN: 9CK00647 through 9CK32795
Caterpillar 1993 – 1998	3176B	ESN: Reman 3LZ00001 and up
Caterpillar 1993 – 1998	C-10	ESN: 2PN01000 through 2PN07278
Caterpillar 1993 – 1998	C-10	ESN: 8YS00449 through 8YS07060
Caterpillar 1993 – 1998	C-10	ESN: Reman AKB00001 and up
Caterpillar 1993 – 1998	C-12	ESN: 1YN01200 through 1YN12844
Caterpillar 1993 – 1998	C-12	ESN: 9NS00372 through 9NS19786
Caterpillar 1993 – 1998	C-12	ESN: Reman ALS00001 and up
Cummins 1993 – 1998	ISB	Critical Parts List Number (CPL) 2446 through 2451

Cummins 1993 – 1998	M11	CPL 1855, 1856, 1857, 2036, 2037, 2370, and 2371
Cummins 1993 – 1998	N14	CPL 1573, 1574, 1807, 1809, 1844, 1987, 2025, 2026, 2027, 2389, 2390, and 2391
Detroit Diesel Corp. 1994 – 1998	6067-GK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-GK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-TK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-TK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-PK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-PK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-WK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-WK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-SK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-SK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-EK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-EK28	ESN 6R157655 through 6R472018
Mack 1994 – 1998	EM7-275	ESN 4B through 8R
Mack 1994 – 1998	EM7-300	ESN 4B through 8R
Mack 1994 – 1998	E7-300	ESN 4B through 8R
Mack 1994 – 1998	E7-310/330	ESN 4B through 8R
Mack 1994 – 1998	E7-330/350	ESN 4B through 8R
Mack 1994 – 1998	E7-350	ESN 4B through 8R
Mack 1994 – 1998	E7-355/380	ESN 4B through 8R
Mack 1994 – 1998	E7-375	ESN 4B through 8R
Mack 1994 – 1998	E7-400	ESN 4B through 8R
Mack 1994 – 1998	E7-427	ESN 4B through 8R
Mack 1994 – 1998	E7-454	ESN 4B through 8R
Mack 1994 – 1998	E7-460	ESN 4B through 8R
Renault 1993 –1998	MIDR06.02.26	
Navistar/International 1998	DT 466E	Engine Family Number (EFN) WNVXH0466FNA
Navistar/International 1998	DT 466E	EFN: WNVXH0466CCB, WNVXH0466FNC
Navistar/International 1998	DT 466E	EFN: WNVXH0466CCD
Navistar/International 1998	530E	EFN: WNVXH0530FNA, WNVXH0530CCB
Navistar/International 1998	530E	EFN: WNVXH0530FNC, WNVXH0530CCD
Volvo 1994 – 1998	VE D12	Engine Family Name (EFNa) RVT12.EJDBRA
Volvo 1994 – 1998	VE D12	EFNa: SVT12.EJDBRA, TVT12.EJDBRA
Volvo 1994 – 1998	VE D12A	EFNa: VVT12.EJDBRA
Volvo 1994 – 1998	VE D12B-345 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-385 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-425 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-345 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-385 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-425 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D7C-275	EFNa: WVTXH07.350S
Volvo 1994 – 1998	VE D7C-300	EFNa: WVTXH07.350S

(c) Requirements.

(1) On or after the applicable implementation date in subsection (d), no person may operate a vehicle propelled by a Low NOx Rebuild Engine on highways within the State of California without a Low NOx Rebuild Kit installed that meets the following emission requirements:

Software Upgrade Requirements					
Option A (1994 – 1998)			Option B (1993 – 1998)		
	MHDDE	HHDDE		MHDDE	HHDDE
Euro III	6.0 g/bhp-hr	7.0 g/bhp-hr	Euro III	6.5 g/bhp-hr	7.5 g/bhp-hr
NTE	7.5 g/bhp-hr	8.75 g/bhp-hr	NTE	8.1 g/bhp-hr	9.38 g/bhp-hr

Manufacturer Option for Software Upgrade		
Company	Option	MY Year
Caterpillar	B	1993 - 1998
Cummins	B	1993 - 1998
Detroit Diesel Corporation	A	1994 – 1998
Mack	A	1994 – 1998
Navistar	not applicable	1998 (only)
Volvo	A	1994 – 1998
Renault	A	1994 - 1998

(2) A Low NOx Rebuild Engine manufacturer's authorized dealers, distributors, repair facilities, or rebuilders must provide a Low NOx Rebuild Kit to the vehicle owner or operator upon request.

(3) A Low NOx Rebuild Engine manufacturer's authorized dealers, distributors, repair facilities, or rebuilders must not install on a Low NOx Rebuild Engine any engine software containing electronic control strategies, other than a Low NOx Rebuild Kit.

(4) Any person installing a Low NOx Rebuild Kit must affix a label to each engine at time of installation. The label must do all of the following:

(A) The label must contain an identifiable characteristic allowing the ARB to determine whether a Low NOx Rebuild Engine has had the appropriate Low NOx Rebuild Kit installed. This identifiable characteristic may be a unique part number or other marking on the engine control module;

(B) The label must contain a statement with appropriate blank spaces for the individual performing the installation to indicate when and by whom the Low NOx Rebuild Kit was installed on the engine;

(C) The label must be placed in such a location as approved by the ARB consistent with California law;

(D) The label must be fabricated of a material suitable for the location in which it is installed; and

(E) The label must not be readily removable intact.

(5) A vehicle owner cited for violating (c)(1) of this section must submit proof of Low NOx Rebuild Kit installation, as identified in title 13, CCR, section 2186, within 45 days of personal or certified receipt of the citation.

(d) Implementation Dates.

(1) 1993 and 1994 model year Low NOx Rebuild Engines must have a Low NOx Rebuild Kit installed by April 30, 2004.

(2) 1995 and 1996 model year Low NOx Rebuild Engines must have a Low NOx Rebuild Kit installed by August 31, 2004.

(3) 1997 and 1998 model year Low NOx Rebuild Engines must have a Low NOx Rebuild Kit installed by December 31, 2004.

NOTE: Authority Cited: Sections 39600, 39601, 43013,43018, and 43701, Health and Safety Code. Reference: Sections 39001, 39003, 43000, 43013, and 43018, Health and Safety Code.

Amend section 2180.1, title 13, California Code of Regulations to read as follows:

§ 2180.1. Definitions

(a) The definitions of this section supplement and are governed by the definitions set forth in Chapter 2 (commencing with section 39010), Part 1, Division 26 of the Health and Safety Code. The following definitions shall govern the provisions of this chapter.

(1) "ARB post-repair inspection" means a repeat emission control system inspection, conducted by the Air Resources Board at an Air Resources Board-specified site, for the purpose of clearing a citation.

(2) "ARB post-repair test" means a repeat test, conducted by the Air Resources Board at an Air Resources Board-specified site, for the purpose of clearing a citation.

(3) "Basic penalty" means the civil penalty of ($500) for a test procedure or emission control system inspection violation that is to be deposited in the Vehicle Inspection and Repair Fund.

(4) "Citation" means a legal notice issued by the Air Resources Board to the owner of a heavy-duty vehicle requiring the owner to repair the vehicle and to pay a civil penalty.

(5) "Defective" means a condition in which an emission control system or an emission control system component is malfunctioning due to age, wear, malmaintenance, or design defects.

(6) "Demonstration of correction" means the documents identified in section 2186(a) or successful completion of an ARB post-repair test or inspection.

(7) "Driver" has the same meaning as defined in California Vehicle Code section 305.

(8) "Emission control label" means the label required by the "California Motor Vehicle Emission Control Label Specifications", incorporated by reference in 13 CCR, section 1965, or Title 40, Code of Federal Regulations (40 CFR), section 86.085-35 or 40 CFR Part 86, Subpart A.

(9) "Emission control system" means the pollution control components on an engine at the time its engine family is certified, including, but not limited to, the emission control label.

(10) "Executive Officer" means the Executive Officer of the Air Resources Board or his or her designee.

(11) "Fleet" means two (2) or more heavy-duty vehicles.

(12) "Heavy-duty vehicle" means a motor vehicle having a manufacturer's maximum gross vehicle weight rating (GVWR) greater than 6,000 pounds, except passenger cars.

(13) "Inspection procedure" means the test procedure specified in section 2182 and the emission control system inspection specified in section 2183.

(14) "Inspection site" means an area including a random roadside location, a weigh station, or a fleet facility used for conducting the heavy-duty vehicle test procedure, emission control system inspection, or both.

(15) "Inspector" means an Air Resources Board employee with the duty of enforcing Health and Safety Code sections 43701(a) and 44011.6, and Title 13, CCR sections 2180 through 2194.

(16) "Issuance" means the act of mailing or personally delivering a citation to the owner.

(17) "Minimum penalty" means the ($300) penalty that is to be deposited in the Diesel Emission Reduction Fund pursuant to Health and Safety Code section 44011.6(l).

(18) "Notice of Violation" means a legal notice issued to the owner of a heavy-duty vehicle powered by a pre-1991 model-year diesel engine with a measured smoke opacity exceeding 55 percent but not exceeding 69 percent, requiring the owner to repair the vehicle and submit a demonstration of correction.

(19) "Officer" means a uniformed member of the Department of the California Highway Patrol.

(20) "Opacity" means the percentage of light obstructed from passage through an exhaust smoke plume.

(21) "Owner" means either (A) the person registered as the owner of a vehicle by the California Department of Motor Vehicles (DMV), or its equivalent in another state, province, or country; or (B) a person shown by the registered owner to be legally responsible for the vehicle's maintenance. The person identified as the owner on the registration document carried on the vehicle at the time a citation is issued shall be deemed the owner unless that person demonstrates that another person is the owner of the vehicle.

(22) "Removal from service" means the towing and storage of a vehicle under the auspices of the Department of the California Highway Patrol.

(23) "Repair facility" means any place where heavy-duty vehicles are repaired, rebuilt, reconditioned, or in any way maintained for the public at a charge, and fleet maintenance facilities.

(24) "SAE J1667" means Society of Automotive Engineers (SAE) Recommended Practice SAE J1667 "Snap-Acceleration Smoke Test Procedure for Heavy-Duty Diesel Powered Vehicles," as issued February 1996 ("1996-02"), which is incorporated herein by reference.

(25) "Scan tool evaluation" means using an electronic device to determine if a Low NOx Rebuild Kit, as defined in section 2011(b)(1), is installed.

(2~~5~~6) "Schoolbus" means the same as defined in California Vehicle Code section 545.

(2~~6~~7) "Smokemeter" means a detection device used to measure the opacity for smoke in percent opacity.

(2~~7~~8) "Tampered" means missing, modified, or disconnected.

(2~~8~~9) "Uncleared citation" means a citation for which demonstration of correction and, if required, payment of any civil penalty, has not been made.

NOTE: Authority Cited: Sections 39600, 39601, 43013, 43701, and 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6, Health and Safety Code. Section 505, Vehicle Code.

Amend section 2181, title 13, California Code of Regulations to read as follows:

§ 2181. Responsibilities of the Driver and Inspector During the Inspection Procedure.

(a) Driver of heavy-duty diesel-powered vehicle. The driver of a heavy-duty diesel-powered vehicle selected to undergo the inspection procedure shall do all of the following:

(1) Drive the vehicle to the inspection site upon direction of an officer.

(2) Perform the test procedure upon request by an inspector.

(3) Open the vehicle door so that the inspector can observe the driver depress the accelerator pedal.

(4) Permit an emission control system inspection upon the request of the inspector.

(5) Permit a scan tool evaluation upon request of the inspector.

(~~5~~6) Sign the citation or notice of violation to acknowledge its receipt and the smoke test report to acknowledge performance of the test procedure.

(b) Driver of heavy-duty gasoline-powered vehicle. The driver of a heavy-duty gasoline-powered vehicle selected to undergo the inspection shall:

(1) Drive the vehicle to the inspection site upon direction of an officer.

(2) Permit an emission control system inspection upon request of the inspector.

(3) Sign the citation to acknowledge its receipt.

(c) Inspector. The inspector in performing the inspection procedure shall do all of the following:

(1) Advise the driver that refusal to submit to the inspection procedure is a violation of these regulations

(2) Obtain engine identification information from the vehicle when tested pursuant to section 2182 to determine which opacity standard specified in section 2182 applies.

(3) Except as otherwise provided in section 2181(c)(4), issue a copy of the citation to the driver of a vehicle that fails the test procedure or the emission control system inspection.

(4) Issue a copy of the notice of violation to the driver of a vehicle powered by a pre-1991 model-year diesel engine with a measured smoke opacity exceeding 55 percent but not exceeding 69 percent, except where a notice of violation or citation has been issued for the vehicle in the preceding 12 months.

(5) Issue a warning to the owner of a heavy-duty diesel-powered vehicle missing its emission control label that the label must be replaced and the engine number identification must be provided to the ARB within 30 days of written notification by the ARB, or it will be conclusively presumed in any subsequent smoke opacity test where the emission control label remains missing that the vehicle is subject to the 40 percent smoke opacity standard in section 2182(a)(1), unless at the time of the subsequent test it is plainly evident from a visual inspection that the vehicle is powered by a pre-1991 model-year engine.

(6) Issue a copy of the citation to the driver of a 1993-1998 heavy-duty diesel-powered vehicle with a Low NOx Rebuild Engine upon determining by scan tool evaluation a violation of section 2011 (c)(1), title 13, California Code of Regulations.

NOTE: Authority Cited: Sections 39600, 39601, 43013, 43701, and 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6, Health and Safety Code. Section 305, Vehicle Code.

Amend section 2184, title 13, California Code of Regulations to read as follows:

§ 2184. Refusal to Submit to Inspection Procedure.

The refusal by an owner or driver of a vehicle to submit to the scan tool evaluation defined in section 2180.1, the test procedure in section 2182, or to the emission control system inspection in section 2183 constitutes a failure of the evaluation, test procedure, or inspection, unless the driver is cited by the California Highway Patrol for a violation of California Vehicle Code section 2813.

NOTE: Authority Cited: Sections 39600, 39601, 43013, 43701, and 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6, Health and Safety Code. Sections 305, 505, and 2813, Vehicle Code.

Amend section 2185, title 13, California Code of Regulations to read as follows:

§ 2185. Civil Penalty Schedule.

(a) The owner of a heavy-duty vehicle that fails the scan tool evaluation, the test procedure, or the emission controls system inspection, including by refusal to submit, is subject to the following penalty schedule:

(1) Scan Tool Evaluations

(A) The owner of a vehicle that is cited for a violation of section 2011(c)(1), and for which demonstration of correction is provided and payment is made within 45 days from personal or certified mail receipt of the citation, shall pay a civil penalty of $300. Schoolbuses registered in California are exempt from the $300 civil penalty for the first violation only.

(B) A vehicle owner who violates section 2011(c)(5) shall pay a civil penalty of $500 in addition to the civil penalty for the violation of section 2011(c)(1).

(C) The owner of a vehicle cited for a violation of section 2184 for refusing to submit to a scan tool evaluation shall be subject to a civil penalty of $500.

(~~1~~2) The owner of a vehicle, other than a schoolbus, that is cited for the first time pursuant to section 2182 or 2183 and for which demonstration of correction is provided and payment is made within 45 days from personal or certified mail receipt of the citation, shall pay the minimum penalty of $300.

(~~2~~3) The owner of a vehicle that is cited for the first time pursuant to section 2184 for a refusal not pertaining to a scan tool evaluation, or that is cited for the first time pursuant to section 2182 or 2183 and for which demonstration of correction is not provided within 45 days from personal mail or certified mail receipt of the citation shall provide demonstration of correction and pay the minimum penalty of $300 and the basic penalty of $500 for a total of $800. Schoolbuses are exempt from the $300 minimum penalty for the first violation only.

(~~3~~4) The owner of a vehicle that is cited pursuant to section 2182 or 2183 within 12 months from the issuance of the most recent citation for that vehicle shall within 45 days from personal or certified mail receipt of the current citation provide demonstration of correction and pay the penalty of $1,500 and the minimum penalty of $300 for a total of $1,800.

(b) (1) No citation shall be issued to the owner of a heavy-duty vehicle powered by a pre-1991 model-year diesel engine on the basis of a measured smoke opacity exceeding 55 percent but not exceeding 69 percent, unless:

(A) the owner fails to provide a demonstration of correction within 45 days from personal or certified mail receipt of the notice of violation, or

(B) a notice of violation or citation has been issued for the vehicle in the preceding 12 months.

(2) The owner of a vehicle that is the subject of a notice of violation and for which demonstration of correction is provided within 45 days from personal or certified mail receipt of the notice of violation shall not be subject to a penalty for the violation.

(3) The owner of a vehicle that is initially subject to a notice of violation, but is cited after a demonstration of correction is not provided within 45 days from personal or certified mail receipt of a notice of violation, shall be subject to the penalty in section 2185(a)(2).

(4) (A) Where a heavy-duty vehicle with a pre-1991 engine inspected in accordance with section 2181 has a measured opacity exceeding 55 percent but not exceeding 69 percent within 12 months of issuance of a notice of violation for which a demonstration of correction was timely provided within the applicable 45-day period, a citation shall be issued and the owner shall be subject to the penalty in section 2185(a)(2).

(B) Where a heavy-duty vehicle with a pre-1991 engine inspected in accordance with section 2181 has a measured opacity exceeding 55 percent but not exceeding 69 percent within 12 months of issuance of a notice of violation for which a demonstration of correction was not timely provided within the applicable 45-day period, a citation shall be issued and the owner shall be subject to the penalty in section 2185(a)(3).

(c) If a vehicle fails the test procedure or an emission control system inspection one year or more after the date of its most recent failure, the owner of that vehicle shall be subject to the penalty schedule in section 2185(a)(1)(B) and (a)(2).

(d) When a vehicle is cited after a bona fide change of ownership between non-related persons or entities, the new owner shall be subject to the penalty schedule in section 2185(a)(1) and (2) if the only citations issued for the vehicle

within the previous 12 months were issued prior to the change of ownership to the new owner.

(e) An owner who has been cited twice or more for tampered emission controls on the same vehicle shall be subject to the penalty in section 2185(a)(3), notwithstanding section 2185(c).

NOTE: Authority Cited: Sections 39600, 39601, 43013, and 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, and 44011.6, Health and Safety Code. Sections 305, 505, and 545, Vehicle Code.

Amend section 2186, title 13, California Code of Regulations to read as follows:

§ 2186. Demonstration of Correction and Post-Repair Test or Inspection.

(a) The owner ~~may~~ must demonstrate correction of the vehicle by submitting to the Air Resources Board one of the following documents (1) through (5):

(1) Where repairs are made at a repair facility, a repair receipt or a completed work order which contains the following information:

(A) Name, address, and phone number of the facility;

(B) Name of mechanic;

(C) Date of the repair;

(D) Description of component replacement(s), repair(s), and/or adjustment(s); and

(E) Itemized list of replaced component(s), including description of part, part number, and cost~~.~~;

(2) Where the owner makes his or her own repairs outside of a repair facility,

(A) An itemized receipt for the parts used in the repair, and

(B) A statement identifying the date and nature of the repairs made~~.~~;

(3) Where the citation or notice of violation was based on a failure to meet the opacity standard applicable under section 2182, a smoke test report from a subsequent test showing that the repaired vehicle passed the applicable section 2182 standard along with a statement to that effect made under penalty of perjury by the person who conducted the subsequent test~~.~~;

(4) Where the citation was based on a failure to pass an emission control system inspection as specified in section 2183, a statement by a person, under penalty of perjury, that the person has reinspected any components identified in the citation as defective or tampered and has determined that these components are in good working order~~.~~; or

(5) Where the citation was based on a violation of the Low NOx Rebuild Kit installation requirement as specified in section 2011(c), a statement by a person, under penalty of perjury, that the person has conducted a scan tool evaluation and has determined that the Low NOx Rebuild Kit has been installed.

(b) In lieu of submitting one of the documents identified under section 2186(a), the owner may demonstrate correction of the vehicle by submitting it to an ARB post-repair test or an ARB post-repair inspection.

(c) The Air Resources Board shall require an ARB post-repair test or an ARB post-repair inspection whenever:

(1) a submitted repair receipt or work order does not comply with (a) above;

(2) a repair receipt or work order appears to be falsified; or

(3) a second and subsequent failures of the test procedure or an emission control system inspection on the vehicle occur within a one-year period.

NOTE: Authority Cited: Sections 39600, 39601, 43013, 43701, 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6, Health and Safety Code. Section 505, Vehicle Code.

Amend section 2192, title 13, California Code of Regulations to read as follows:

§ 2192. Vehicle Inspection Responsibilities.

(a) The owner of a heavy-duty diesel-powered vehicle subject to the requirements of this chapter shall do all of the following:

(1) Test the vehicle for excessive smoke emissions periodically according to the inspection intervals specified in section 2193(a), (b), and (c).

(2) Measure the smoke emissions for each test using the test procedure specified in section 2193(e).

(3) Record the smoke test opacity levels and other required test information as specified in section 2194.

(4) Have the vehicle repaired if it exceeds the applicable smoke opacity standard specified in section 2193(e).

(5) Record the vehicle repair information as specified in section 2194.

(6) Conduct a post-repair smoke test to determine if the vehicle complies with the applicable smoke opacity standard.

(7) Record the post-repair smoke test results as specified in section 2194.

(8) If the vehicle does not comply with the applicable smoke opacity standard after the test required by section 2192(a)(7), make additional repairs to achieve compliance, and record the smoke test results as specified in section 2194.

(9) Ensure that Low NOx Rebuild Kits are installed in 1993 – 1998 heavy-duty diesel-powered vehicles with Low NOx Rebuild Engines as required by section 2011.

(~~9~~10) Keep the records specified in section 2194 for two years after the date of inspection.

(1~~0~~1) Permit an Air Resources Board inspector to review the inspection records specified in section 2194 at owner/operator designated fleet locations by appointment.

NOTE: Authority Cited. Sections 39600, 39601, and 43701(a), Health and Safety Code. Reference: Sections 39002, 39003, 39033, 43000, 43016, 43018, 43701(a), and 44011.6, Health and Safety Code.

Amend section 2194, title 13, California Code of Regulations to read as follows:

§ 2194. Record Keeping Requirements.

(a) The owner of a vehicle subject to the requirements of this chapter shall record the following information when performing the smoke opacity testing:

(1) The brand name and model of the opacity meter.

(2) The brand name and model of the strip chart recorder, if an SAE J1243 type smoke meter is employed.

(3) The dates of last calibration of the opacity meter and chart recorder.

(4) The name of the smoke meter operator who conducted the test.

(5) The name and address of the contracted smoke test facility or vehicle repair facility that conducted the test (if applicable).

(6) The applicable smoke opacity standard for the tested vehicle.

(7) Vehicle identification number, vehicle's engine year, engine make, and engine model, and test date. Fleet-designated vehicle identification numbers are also acceptable.

(8) The initial smoke test opacity levels (for three successive test readings).

(9) An indication of whether the vehicle passed or failed the initial smoke test.

(10) The post-repair test date.

(11) The post-repair smoke test opacity levels (for three successive test readings).

(12) An indication of whether the vehicle passed or failed the post-repair smoke test.

(13) For vehicles that have failed the smoke test and have been repaired, the vehicle repair information specified in section 2186(a), Title 13, California Code of Regulations.

(b) The owner of a vehicle subject to the requirements of this chapter shall record the following information to demonstrate installation of Low NOx Rebuild Kits:

(1) A repair receipt or completed work order which contains the following information:

(A) Name, address, and phone number of the facility performing the installation;

(B) Name of the person performing the installation;

(C) Date of the installation;

(D) Description of Low NOx Rebuild Engine, including engine family name and number, and Low NOx Rebuild Kit installed.

NOTE: Authority Cited: Sections 39600, 39601, and 43701, Health and Safety Code. Reference: Sections 39002, 39003, 39033, 43000, 43018, 43701, and 44011.6, Health and Safety Code.

APPENDIX B

LOW NOX REBUILD PROGRAM REQUIREMENTS

Note: This is not a legal document and is not intended to represent the minor manufacturer-specific requirements in the individual Consent Decrees/Settlement Agreements. This appendix is intended only to help clarify the Low NOx Rebuild Program requirements. Text set within [ ] is descriptive and not included in the Settlement Agreements.

Low NOx Rebuild Program

64. Each engine manufacturer shall implement, in accordance with this Section, a program to reduce NOx emissions from an engine manufacturer's Low NOx Rebuild Engines (as defined below) through certain software and/or minor hardware changes made to the engines through the use of a Low NOx Rebuild Kit. The term "Low NOx Rebuild Engines" means: an engine manufacturer's Model Year 1994 and later MHDDE and HHDDE Pre-Settlement Engines if an engine manufacturer elects Option A below; or Model Year 1993 and later MHDDE and HHDDE Pre-Settlement Engines if an engine manufacturer elects Option B below, but shall exclude, in either case, an engine manufacturer's low-volume ratings representing not more than ten percent in the aggregate of the total volume of MHDDE and HHDDE Pre-Settlement Engines manufactured during the applicable Model Years to avoid requiring unique calibrations or other modifications for such ratings where it would be unduly burdensome in relationship to the number of engines involved and the expected emission reductions.

65. Within 90 days of the Date of Filing, each engine manufacturer shall submit to the ARB and the United States, for review and approval by each, a single plan for the implementation of its Low NOx Engine Rebuild Program in California. Each Low NOx Rebuild Kit designed and developed by an engine manufacturer shall meet the emission limits under either Option A or Option B:

Option A:

for MHDDEs only:

(a) EURO III Composite Value Limits for NOx of 6.0 g/bhp-hr for Model Years 1994-1998 engines, 1.0 times the applicable California standards for all other regulated pollutants when tested on the EURO III Test Protocol in accordance with [the technical requirements described in] Appendix C of this Settlement Agreement, and the associated Emissions Surface Limits specified in that Appendix;

(b) an NTE Limit for NOx of 7.5 g/bhp-hr for Model Years 1994-1998 engines.

for HHDDEs only:

(c) EURO III Composite Value Limits for NOx of 7.0 g/bhp-hr for Model Years 1994-1998 engines, 1.0 times the applicable California standards for all other regulated pollutants when tested on the EURO III Test Protocol in accordance with [the technical requirements described in] Appendix C of this Settlement Agreement, and the associated Emissions Surface Limits specified in that Appendix; and

(d) an NTE Limit for NOx of 8.75 g/bhp-hr for Model Years 1994-1998.

Option B:

for *MHDDEs* only:

(a) EURO III Composite Value Limits for NOx of 6.5 g/bhp-hr for Model Years 1993-1998 engines, 1.0 times the applicable California standards for all other regulated pollutants when tested on the EURO III Test Protocol in accordance with [the technical requirements described in] Appendix C to this Settlement Agreement, and the associated Emissions Surface Limits specified in that Appendix;

(b) an NTE Limit for NOx of 8.1 g/bhp-hr for Model Year 1993-1998 engines.

for HHDDEs only:

(c) EURO III Composite Value Limits for NOx of 7.5 g/bhp-hr for Model Year 1993-1998 engines, 1.0 times the applicable California standards for all other regulated pollutants when tested on the EURO III Test Protocol in accordance with [the technical requirements described in] Appendix C to this Settlement Agreement, and the associated Emissions Surface Limits specified in that Appendix; and

(d) an NTE Limit for NOx of 9.38 g/bhp-hr for Model Year 1993-1998 engines.

66. If, prior to or after submission of a plan pursuant to Paragraph 65 [in some Settlement Agreements 65A], an engine manufacturer determines that it cannot meet the applicable limits specified in Paragraph 65 [in some Settlement Agreements 65A], for any HDDE individual engine rating (referred to in this Paragraph as a "subject rating") with software and/or minor hardware changes, it shall submit to the ARB and the United States, for review and approval by each, a single alternative or revised Low NOx Rebuild Plan in accordance with this Paragraph. The alternative or revised plan shall state the NOx emissions that it proposes to achieve for each subject rating and shall describe how an engine manufacturer will offset a NOx emission limit higher than the limits in Paragraph

65 [in some Agreements 65A], within the same class of engines subject to the Low NOx Rebuild Program. An engine manufacturer may elect to use a production-weighted average approach within the applicable HDDE class (i.e., HHDDE or MHDDE) to demonstrate compliance with the applicable limit specified in Paragraph 65 [in some Settlement Agreements 65A]. The NOx production-weighted average shall be calculated by multiplying the NOx emission level that will be achieved for each rating through the use of the appropriate Low NOx Rebuild Kit by the production volume for the rating, summing those terms, and dividing by the total production Low NOx Rebuild Engines. Each engine manufacturer's alternative or revised plan submitted pursuant to this Paragraph shall demonstrate that each engine manufacturer's Low NOx Rebuild Kits would, on a production-weighted NOx average basis, achieve the applicable limits specified in Paragraph 65 [in some Settlement Agreements 65A]. As an alternative, if an engine manufacturer contends that any individual rating cannot meet the applicable limits, it may elect to increase the quantity of engines included in the Low NOx Rebuild Program by including portions of earlier Model Year engine families, such that the product of the quantity of additional engines and associated NOx reduction shall be equivalent to the product of the quantity of engines for the subject rating from the original Low NOx Rebuild Plan and the NOx exceedance for that rating.

67. In addition to software and/or minor hardware needed to meet the requirements specified in Paragraph 65 [in some Settlement Agreements 65A], all Low NOx Rebuild Kits shall include a label meeting the requirements of Paragraph 77.

68. Each engine manufacturer shall make available Low NOx Rebuild Kits for distribution and sale for Low NOx Rebuild Engines according to the following schedule:

i. Beginning 180 days after the Date of Entry, or 90 days following ARB's approval of the Low NOx Rebuild Plan required in Paragraph 65 [in some Settlement Agreements 65A], whichever is later, each engine manufacturer shall begin supplying Low NOx Rebuild Kits.

ii. Within 90 days following the applicable date in Paragraph 68(i), each engine manufacturer shall make available Low NOx Rebuild Kits in quantities necessary to meet expected demand for engine families representing at least fifty percent of the engines for which Low NOx Rebuild Kits must be produced under the Low NOx Rebuild Plan.

iii. Within 360 days following the applicable date in Paragraph 68(i), each engine manufacturer shall make available Low NOx Rebuild Kits in quantities necessary to meet expected demand for all engine families for which Low NOx Rebuild Kits must be produced under the Low NOx Rebuild Plan.

69. Beginning on the date a Low NOx Rebuild Kit is available for any engine family under the terms of Paragraph 68, each engine manufacturer shall sell and use, and authorize the sale and use of, only Low NOx Rebuild Kits for any Low NOx Rebuild Engine in that family in the case of any Engine Rebuild for:

(a) any HHDDE that has accumulated mileage greater than 290,000 miles, or any MHDDE that has accumulated mileage greater than 185,000 miles; or

(b) any HHDDE or MHDDE that has accumulated less than the applicable mileage specified in Paragraph 69(a), where the service event includes replacement or reconditioning of more than one Major Cylinder Component in all of the engine's cylinders.

70. A Low NOx Rebuild Kit may not increase any regulated emission beyond applicable limits when tested on the California Test Procedures.

71. Each engine manufacturer shall install, and shall authorize its authorized dealers, distributors, repair facilities, and rebuild facilities to install, only Low NOx Rebuild Kits as required under Paragraph 64 at no added cost to the owner above the amount the owner would otherwise pay to have the engine rebuilt or repaired. In addition, subject to the provisions of Paragraph 72 each engine manufacturer shall make available, either directly or through its affiliated distribution networks, at no added cost, the appropriate Low NOx Rebuild Kit to any non-affiliated engine rebuilder or person who requests it. For the purposes of this Section, "at no added cost" shall mean:

(a) if a Low NOx Rebuild Kit contains parts normally replaced at engine rebuild, an engine manufacturer shall not charge more than the then-current price for the original part; and

(b) if a Low NOx Rebuild Kit requires a part not normally replaced during rebuild, then such part shall be included without charge. Each engine manufacturers shall make arrangements to reimburse its authorized dealers, distributors, repair facilities, and rebuild facilities, so that the ultimate purchaser of a Low NOx Rebuild Kit will not be charged for any required reprogramming through its authorized dealers, distributors, repair facilities, and rebuild facilities, including any computer connection fees.

72. Notwithstanding the provisions in Paragraph 71 each engine manufacturer, its authorized dealers, distributors, repair facilities, and rebuild facilities may impose an additional fee for engine control software that includes both the low NOx reprogramming and other software enhancements for purposes unrelated to reducing NOx emissions, provided that:

(a) The customer is given the option of obtaining Low NOx Rebuild reprogramming alone at no cost; and

(b) The customer chooses the option that includes such other software enhancements.

73. Each Low NOx Rebuild Kit shall be clearly marked with an identifiable characteristic allowing the ARB to determine whether a Low NOx Rebuild Engine has been rebuilt with the appropriate Low NOx Rebuild Kit. This identifiable characteristic may be a unique part number or other marking on the engine control module, or may be a readily accessible software identification parameter, including engine code marker or calibration marker.

74. Each engine manufacturer shall take all reasonable steps to inform its authorized dealers, distributors, repair facilities, and rebuild facilities about the requirements of this program and the availability of Low NOx Rebuild Kits, including, but not limited to, sending written notification to these entities within 120 days after each engine manufacturer's Low NOx Rebuild Plan is approved.

75. In addition to any requirement set forth above:

(a) Each engine manufacturer shall include as part of its Low NOx Rebuild Plan, submitted under Paragraph 65 [in some Settlement Agreements 65A], the following:

(i) A description of each engine family to be covered by a Low NOx Rebuild Kit, including the Model Year, model, and such other information as may be required to identify the engines to be rebuilt with Low NOx Rebuild Kits, and any engine rating otherwise covered by the Low NOx Rebuild Program which each engine manufacturer has elected to exclude under the ten percent exclusion for low-volume ratings.

(ii) A list of all of each engine manufacturer's authorized dealers, distributors, repair facilities, and rebuild facilities who will install the Low NOx Rebuild Kits, and a statement that these persons will be properly equipped and instructed to install such kits.

(iii) A description of the procedure to be followed by non-affiliated engine rebuild facilities or persons to obtain Low NOx Rebuild Kits.

(iv) A description of the system by which each engine manufacturer will ensure an adequate number of Low NOx Rebuild Kits will be available to be installed by affiliated and non-affiliated engine rebuild facilities, including the method to be used to ensure the supply of Low NOx Rebuild Kits remains both adequate and responsive to engine rebuild facilities' demand.

(v) An example of the written notification to be sent to all of each engine manufacturer's authorized dealers, distributors, repair facilities, or rebuild facilities.

(b) Each engine manufacturer shall submit to the ARB, 30 days prior to the date any Low NOx Rebuild Kit will be made available, the following additional information:

(i) A statement of the NOx limits each Low NOx Rebuild Kit achieves, and a certification that these limits meet the limits applicable under Paragraph 65 [in some Settlement Agreements 65A], or, if an engine manufacturer asserts such limits cannot be achieved, the submissions required under Paragraph 66.

(ii) A copy of all necessary instructions to be sent to those persons who are to install Low NOx Rebuild Kits. This shall include designation of the date on or after which the Low NOx Rebuild Kits will be available from an engine manufacturer and the time reasonably necessary to perform the labor required to install the kits.

(iii) A description of the impact of the proposed changes on fuel consumption, driveability, and safety for each class or category of Low NOx Rebuild Engines and a brief summary of the data, technical studies, or engineering evaluations which support these conclusions.

76. The written notification to be sent to each engine manufacturer's authorized dealers, distributors, repair facilities, and rebuild facilities shall contain the following:

(a) A copy of ARB's letter to rebuild facilities regarding the use of Low NOx Rebuild Kits.

(b) A clear description of actions that will be taken in the rebuild and an identification of the components that are affected by the Low NOx Rebuild.

(c) A description of the procedures which non-affiliated engine rebuilders should follow to obtain appropriate Low NOx Rebuild Kits and the time reasonably necessary to perform the labor required to install the appropriate Low NOx Rebuild Kit.

77. The Plan for each engine manufacturer's Low NOx Rebuild Program submitted to the ARB shall provide that any of each engine manufacturer's authorized dealers, distributors, repair facilities, or rebuilders who install a Low NOx Rebuild Kit shall be instructed to complete and affix a label to the engine. The label shall contain a statement with appropriate blank spaces for the rebuilder to indicate when and by whom the Low NOx Rebuild Kit was installed on the engine. The label shall be placed in such location as approved by the ARB consistent with California law and shall be fabricated of a material suitable for the location in which it is installed and not readily removable intact engine manufacturers shall also provide such label to any non-affiliated engine rebuilder who installs one of its Low NOx Rebuild Kits and instructions on how to complete the label and where to affix the label.

78. The ARB, in consultation with EPA, shall review the Low NOx Rebuild Plan prepared by engine manufacturers. This may be the same plan prepared by each engine manufacturer and submitted to EPA to meet the requirements of Paragraph 78 of the Consent Decree. The ARB shall provide each engine manufacturer with notice of approval or disapproval of its Low NOx Rebuild Plan within 30 days of its submittal to the ARB. If the Plan is disapproved, the ARB shall provide the reasons for disapproval, and an engine manufacturer shall have 30 days to submit a revised Low NOx Rebuild Plan for approval. Any dispute solely between the ARB and an engine manufacturer regarding the Low NOx Rebuild Plan shall be resolved in accordance with [the Dispute Resolution Process described in] Section XXX of this Settlement Agreement. Each engine manufacturer shall implement the Plan as approved. Any dispute involving a conflict between modifications requested by the United States and modifications requested by the ARB shall be governed by the dispute resolution provisions of Section XVI of the Consent Decree as provided in Paragraph 160B of this Settlement Agreement.

79. Each engine manufacturer shall send to the ARB a copy of all written communications directed to five or more persons which relate to the Low NOx Rebuild Plan directed by an engine manufacturer to engine rebuilders and other persons who are to install Low NOx Rebuild Kits under the Low NOx Rebuild Plan. Such copies shall be mailed to the ARB contemporaneously with their first transmission to engine rebuilders and other persons who are to install Low NOx Rebuild Kits under the Low NOx Rebuild Plan.

80. Each engine manufacturer shall provide for the establishment and maintenance of records to enable the ARB and each engine manufacturer to monitor the implementation of the Low NOx Rebuild Program. The records shall include the following:

(a) the number of engines that will be subject to Low NOx Rebuild; and

(b) a cumulative total of the number of Low NOx Rebuild Kits sold, by part number.

81. Each engine manufacturer shall maintain in a form suitable for inspection, such as computer information storage devices or card files, lists of the names and addresses of engine rebuilders who were provided Low NOx Rebuild Kits and the number of kits provided. The records described in this Paragraph shall be made available to the ARB upon request.

82. The records required by this Section shall be retained in accordance with the provisions of [Access To Information And Retention Of Documents contained in] Paragraph 142 (Record Retention) of this Settlement Agreement. Each engine manufacturer's obligations under Section IX.B shall terminate 10 years from the date of introduction of the first Low NOx Rebuild Kit pursuant to Paragraph 68(i). Each engine manufacturer accepts as a condition of such termination that, after termination, an engine manufacturer will only make available for Engine Rebuilds on Low NOx Rebuild Engines the software and/or minor hardware that corresponds to the Low NOx Rebuild Kit described in Paragraphs 64 through 67 and that complies with Paragraphs 70 and 73.

APPENDIX C

LOW NOx SOFTWARE ENGINE LIST

Low NOx Rebuild Engines		
Make and Year	**Engine Model**	**Notes**
Caterpillar 1993 – 1998	3406E	Engine Serial Number (ESN) 5EK05767 and up
Caterpillar 1993 – 1998	3406E	ESN: 6TS00097 and up
Caterpillar 1993 – 1998	3406E	ESN: 1LW00001 through 1LW33262
Caterpillar 1993 – 1998	3406E	ESN: Reman 4AS00001 through 4AS00385
Caterpillar 1993 – 1998	3126	ESN: 1WM00210 through 1WM26819
Caterpillar 1993 – 1998	3126	ESN: 4ES000226 through 4ES00454
Caterpillar 1993 – 1998	3126	ESN: Reman 6RW00001 and up
Caterpillar 1993 – 1998	3126B	ESN: 7AS00001 through 7AS37588
Caterpillar 1993 – 1998	3116	ESN: 8WL00297 through 8WL07351
Caterpillar 1993 – 1998	3176B	ESN: 9CK00647 through 9CK32795
Caterpillar 1993 – 1998	3176B	ESN: Reman 3LZ00001 and up
Caterpillar 1993 – 1998	C-10	ESN: 2PN01000 through 2PN07278
Caterpillar 1993 – 1998	C-10	ESN: 8YS00449 through 8YS07060
Caterpillar 1993 – 1998	C-10	ESN: Reman AKB00001 and up
Caterpillar 1993 – 1998	C-12	ESN: 1YN01200 through 1YN12844
Caterpillar 1993 – 1998	C-12	ESN: 9NS00372 through 9NS19786
Caterpillar 1993 – 1998	C-12	ESN: Reman ALS00001 and up
Cummins 1993 – 1998	ISB	Critical Parts List Number (CPL) 2446 through 2451
Cummins 1993 – 1998	M11	CPL 1855, 1856, 1857, 2036, 2037, 2370, and 2371
Cummins 1993 – 1998	N14	CPL 1573, 1574, 1807, 1809, 1844, 1987, 2025, 2026, 2027, 2389, 2390, and 2391
Detroit Diesel Corp. 1994 – 1998	6067-GK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-GK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-TK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-TK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-PK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-PK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-WK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-WK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-SK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-SK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-EK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-EK28	ESN 6R157655 through 6R472018
Mack 1994 – 1998	EM7-275	ESN 4B through 8R
Mack 1994 – 1998	EM7-300	ESN 4B through 8R
Mack 1994 – 1998	E7-300	ESN 4B through 8R
Mack 1994 – 1998	E7-310/330	ESN 4B through 8R
Mack 1994 – 1998	E7-330/350	ESN 4B through 8R
Mack 1994 – 1998	E7-350	ESN 4B through 8R
Mack 1994 – 1998	E7-355/380	ESN 4B through 8R
Mack 1994 – 1998	E7-375	ESN 4B through 8R
Mack 1994 – 1998	E7-400	ESN 4B through 8R
Mack 1994 – 1998	E7-427	ESN 4B through 8R
Mack 1994 – 1998	E7-454	ESN 4B through 8R
Mack 1994 – 1998	E7-460	ESN 4B through 8R
Renault 1993 –1998	MIDR06.02.26	
Navistar/International 1998	DT 466E	Engine Family Number (EFN) WNVXH0466FNA
Navistar/International 1998	DT 466E	EFN: WNVXH0466CCB, WNVXH0466FNC
Navistar/International 1998	DT 466E	EFN: WNVXH0466CCD
Navistar/International 1998	530E	EFN: WNVXH0530FNA, WNVXH0530CCB
Navistar/International 1998	530E	EFN: WNVXH0530FNC, WNVXH0530CCD

Low NOx Rebuild Engines		
Volvo 1994 – 1998	VE D12	Engine Family Name (EFNa) RVT12.EJDBRA
Volvo 1994 – 1998	VE D12	EFNa: SVT12.EJDBRA, TVT12.EJDBRA
Volvo 1994 – 1998	VE D12A	EFNa: VVT12.EJDBRA
Volvo 1994 – 1998	VE D12B-345 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-385 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-425 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-345 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-385 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-425 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D7C-275	EFNa: WVTXH07.350S
Volvo 1994 – 1998	VE D7C-300	EFNa: WVTXH07.350S

ATTACHMENT B

PROPOSED REGULATION ORDER

PROPOSED REGULATION ORDER

Add the following section to title 13, California Code of Regulations, to read as set forth on the following pages:

Section 2011	Software Upgrade for 1993 through 1998 Model Heavy-Duty Trucks

Note: This section is shown entirely in plain text.

Amend the following sections of title 13, California Code of Regulations, to read as set forth on the following pages:

Section 2180.1	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Definitions
Section 2181	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Responsibilities of the Driver and Inspector During the Inspection Procedure
Section 2184	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Refusal to Submit to Inspection Procedure
Section 2185	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Civil Penalty Schedule
Section 2186	Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections, Demonstration of Correction and Post-Repair Test or Inspection
Section 2192	Periodic Smoke Inspections of Heavy-Duty Diesel-Powered Vehicles, Vehicle Inspection Responsibilities
Section 2194	Periodic Smoke Inspections of Heavy-Duty Diesel-Powered Vehicles, Record Keeping Requirements

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

Adopt new* section 2011, in new Article 3.5 – Installation of Motor Vehicle Pollution Control Devices (Heavy Duty Motor Vehicles), title 13, California Code of Regulations to read as follows:

*(Note: the entire text of section 2011 as set forth below is new language proposed to be added to the California Code of Regulations to require installation of NOx software in heavy-duty diesel engines.)

§ 2011. Software Upgrade for 1993 through 1998 Model Year Heavy-Duty Trucks.

(a) Applicability. This section 2011 applies to Low NOx Rebuild Engines, as defined, operating in the State of California that are either;

(1) registered in California; or

(2) registered outside of California, as defined.

(b) Definitions. The definitions in section 1900 (b), Chapter 1, title 13 of the California Code of Regulations apply, with the following additions:

(1) "Driver" has the same meaning as title 13, California Code of Regulations, section 2180.1 (a)(7).

(2) "HHDDE" means a heavy-duty diesel engine certified as a motor vehicle heavy heavy-duty engine in accordance with title 13, California Code of Regulations, section 1956.8.

(3) "Incentive project" means a project conducted under applicable provisions in part IX.C of the Heavy Duty Diesel Engine Settlement Agreements with California and Consent Decrees with the United States Environmental Protection Agency. The California Settlement Agreements and federal Consent Decrees are identified in title 13, California Code of Regulations, section 1956.8 (a)(2)(A), footnote 1.

(4) "Low NOx Rebuild Kit" means an engine manufacturer's software and/or minor hardware upgrade that results in lower emissions of oxides of nitrogen (NOx) when installed on the engine control module of heavy-duty diesel engines requiring such kits. Such engines are identified in plans implementing a Low NOx Rebuild Program under both Heavy Duty Diesel Engine Settlement Agreements with California and Consent Decrees with the United States Environmental Protection Agency, and are listed in (b)(5). The California Settlement Agreements and federal Consent Decrees are identified in title 13, California Code of Regulations, section 1956.8 (a)(2)(A), footnote 1.

(5) "Low NOx Rebuild Engine" means a 1993 through 1998 model year heavy-duty diesel engine for which a Low NOx Rebuild Kit must be available for installation. The complete list of Low NOx Rebuild Engines is:

Low NOx Rebuild Engines		
Make and Year	**Engine Model**	**Notes**
Caterpillar 1993 – 1998	3406E	Engine Serial Number (ESN) 5EK05767 and up
Caterpillar 1993 – 1998	3406E	ESN: 6TS00097 and up
Caterpillar 1993 – 1998	3406E	ESN: 1LW00001 through 1LW33262
Caterpillar 1993 – 1998	3406E	ESN: Reman 4AS00001 through 4AS00385
Caterpillar 1993 – 1998	3126	ESN: 1WM00210 through 1WM26819
Caterpillar 1993 – 1998	3126	ESN: 4ES000226 through 4ES00454
Caterpillar 1993 – 1998	3126	ESN: Reman 6RW00001 and up
Caterpillar 1993 – 1998	3126B	ESN: 7AS00001 through 7AS37588
Caterpillar 1993 – 1998	3116	ESN: 8WL00297 through 8WL07351
Caterpillar 1993 – 1998	3176B	ESN: 9CK00647 through 9CK32795
Caterpillar 1993 – 1998	3176B	ESN: Reman 3LZ00001 and up
Caterpillar 1993 – 1998	C-10	ESN: 2PN01000 through 2PN07278
Caterpillar 1993 – 1998	C-10	ESN: 8YS00449 through 8YS07060
Caterpillar 1993 – 1998	C-10	ESN: Reman AKB00001 and up
Caterpillar 1993 – 1998	C-12	ESN: 1YN01200 through 1YN12844
Caterpillar 1993 – 1998	C-12	ESN: 9NS00372 through 9NS19786
Caterpillar 1993 – 1998	C-12	ESN: Reman ALS00001 and up
Cummins 1993 – 1998	ISB	Critical Parts List Number (CPL) 2446 through 2451
Cummins 1993 – 1998	M11	CPL 1855, 1856, 1857, 2036, 2037, 2370, and 2371
Cummins 1993 – 1998	N14	CPL 1573, 1574, 1807, 1809, 1844, 1987, 2025, 2026, 2027, 2389, 2390, and 2391
Detroit Diesel Corp. 1994 – 1998	6067-GK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-GK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-TK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-TK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-PK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-PK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-WK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-WK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-SK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-SK28	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-EK60	ESN 6R157655 through 6R472018
Detroit Diesel Corp. 1994 – 1998	6067-EK28	ESN 6R157655 through 6R472018
Mack 1994 – 1998	EM7-275	ESN 4B through 8R
Mack 1994 – 1998	EM7-300	ESN 4B through 8R
Mack 1994 – 1998	E7-300	ESN 4B through 8R
Mack 1994 – 1998	E7-310/330	ESN 4B through 8R
Mack 1994 – 1998	E7-330/350	ESN 4B through 8R
Mack 1994 – 1998	E7-350	ESN 4B through 8R
Mack 1994 – 1998	E7-355/380	ESN 4B through 8R
Mack 1994 – 1998	E7-375	ESN 4B through 8R
Mack 1994 – 1998	E7-400	ESN 4B through 8R
Mack 1994 – 1998	E7-427	ESN 4B through 8R
Mack 1994 – 1998	E7-454	ESN 4B through 8R
Mack 1994 – 1998	E7-460	ESN 4B through 8R
Renault 1993 –1998	MIDR06.02.26	

Navistar/International 1998	DT 466E	Engine Family Number (EFN) WNVXH0466FNA
Navistar/International 1998	DT 466E	EFN: WNVXH0466CCB, WNVXH0466FNC
Navistar/International 1998	DT 466E	EFN: WNVXH0466CCD
Navistar/International 1998	530E	EFN: WNVXH0530FNA, WNVXH0530CCB
Navistar/International 1998	530E	EFN: WNVXH0530FNC, WNVXH0530CCD
Volvo 1994 – 1998	VE D12	Engine Family Name (EFNa) RVT12.EJDBRA
Volvo 1994 – 1998	VE D12	EFNa: SVT12.EJDBRA, TVT12.EJDBRA
Volvo 1994 – 1998	VE D12A	EFNa: VVT12.EJDBRA
Volvo 1994 – 1998	VE D12B-345 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-385 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-425 EPG	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-345 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-385 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D12B-425 VEB	EFNa: WVTXH12.150S
Volvo 1994 – 1998	VE D7C-275	EFNa: WVTXH07.350S
Volvo 1994 – 1998	VE D7C-300	EFNa: WVTXH07.350S

(6) "MHDDE" means a heavy-duty diesel engine certified as a motor vehicle medium heavy-duty engine in accordance with title 13, California Code of Regulations, section 1956.8.

(7) "Offset project" means a project conducted under applicable provisions in part IX.C of the Heavy Duty Diesel Engine Settlement Agreements with California and Consent Decrees with the United States Environmental Protection Agency. The California Settlement Agreements and federal Consent Decrees are identified in title 13, California Code of Regulations, section 1956.8 (a)(2)(A), footnote 1.

(8) "Owner" has the same meaning as title 13, California Code of Regulations, section 2180.1 (a)(21).

(9) "Registered outside of California" means any of the following:

(A) A heavy-duty diesel-powered vehicle operating in California under the terms of Interstate Reciprocity Agreements as authorized by Article 3 (commencing with section 8000), Chapter 4, Division 3 of the Vehicle Code and which belongs to a fleet that is not based in California;

(B) A heavy-duty diesel-powered vehicle operating in California under the terms of any other apportioned registration, reciprocity, or bilateral prorate registration agreement between California and other jurisdictions and which belongs to a fleet that is not based in California; or

(C) A heavy-duty diesel-powered vehicle operating in California under a short-term vehicle registration or permit of 90 days or less

(including but not limited to 90-day temporary registrations and 4-day permits under Vehicle Code section 4004).

(c) Standards.

(1) On and after the applicable implementation date in subsection (d), a vehicle propelled by a Low NOx Rebuild Engine must not operate on highways within the State of California without a Low NOx Rebuild Kit installed that meets the following emission requirements:

Software Upgrade Requirements					
Option A (1994 – 1998)			Option B (1993 – 1998)		
	MHDDE	HHDDE		MHDDE	HHDDE
Euro III	6.0 g/bhp-hr	7.0 g/bhp-hr	Euro III	6.5 g/bhp-hr	7.5 g/bhp-hr
NTE	7.5 g/bhp-hr	8.75 g/bhp-hr	NTE	8.1 g/bhp-hr	9.38 g/bhp-hr

Manufacturer Option for Software Upgrade		
Company	Option	MY Year
Caterpillar	B	1993 - 1998
Cummins	B	1993 - 1998
Detroit Diesel Corporation	A	1994 – 1998
Mack	A	1994 – 1998
Navistar	not applicable	1998 (only)
Volvo	A	1994 – 1998
Renault	B	1993 - 1998

(2) A Low NOx Rebuild Engine manufacturer's authorized dealers, distributors, repair facilities, and rebuild facilities must:

(A) provide upon request a Low NOx Rebuild Kit to the owner or driver of a vehicle with a Low NOx Rebuild Engine, and to any non-affiliated rebuilder or other person; and

(B) install the Low NOx Rebuild Kit.

(3) No person may install on a Low NOx Rebuild Engine any engine software containing electronic control strategies, other than a Low NOx Rebuild Kit.

(4) Any person installing a Low NOx Rebuild Kit must affix a label to each engine at time of installation. The label must do all of the following:

(A) The label must contain an identifiable characteristic allowing the ARB to determine whether a Low NOx Rebuild Engine has had the

appropriate Low NOx Rebuild Kit installed. This identifiable characteristic may be a unique part number or other marking on the engine control module;

(B) The label must contain a statement with appropriate blank spaces for the individual performing the installation to indicate when and by whom the Low NOx Rebuild Kit was installed on the engine;

(C) The label must be placed in such a location as approved by the ARB consistent with California law;

(D) The label must be fabricated of a material suitable for the location in which it is installed; and

(E) The label must not be readily removable intact.

(5) The owner of a vehicle cited for violating (c)(1) of this section must submit proof of Low NOx Rebuild Kit installation, as identified in title 13, CCR, section 2186, within 45 days of personal or certified receipt of the citation.

(d) Implementation Dates.

(1) 1993 and 1994 model year Low NOx Rebuild Engines must have a Low NOx Rebuild Kit installed by April 30, 2005.

(2) 1995 and 1996 model year Low NOx Rebuild Engines must have a Low NOx Rebuild Kit installed by August 31, 2005.

(3) 1997 and 1998 model year Low NOx Rebuild Engines other than MHDDE must have a Low NOx Rebuild Kit installed by December 31, 2005.

(4) 1997 and 1998 model year MHDDE Low NOx Rebuild Engines must have a Low NOx Rebuild Kit installed by December 31, 2006.

(e) Exemptions.

A Low NOx Rebuild Engine receiving a software upgrade performed as part of an approved incentive or offset project prior to the adoption of Section 2011 is exempt from the requirements in (c).

(f) Severability.

If any provision of this section or the application thereof to any person or circumstances is held invalid, such invalidity shall not affect other provisions or

applications of the section that can be given effect without the invalid provision or application, and to this end the provisions of this section are severable.

(g) The requirement in (c)(2) is a declaration of existing legal obligations.

NOTE: Authority Cited: Sections 39600, 39601, 43013,43018, and 43701, Health and Safety Code. Reference: Sections 39001, 39003, 43000, 43013, and 43018, Health and Safety Code.

Amend section 2180.1, title 13, California Code of Regulations to read as follows:

§ 2180.1. Definitions

(a) The definitions of this section supplement and are governed by the definitions set forth in Chapter 2 (commencing with section 39010), Part 1, Division 26 of the Health and Safety Code. The following definitions shall govern the provisions of this chapter.

(1) "ARB post-repair inspection" means a repeat emission control system inspection, conducted by the Air Resources Board at an Air Resources Board-specified site, for the purpose of clearing a citation issued under section 2185(a)(2)(C).

(2) "ARB post-repair test" means a repeat test, conducted by the Air Resources Board at an Air Resources Board-specified site, for the purpose of clearing a citation issued under section 2185(a)(2)(C).

(3) "Basic penalty" means the civil penalty of ($500) for a test procedure or emission control system inspection violation that is to be deposited in the Vehicle Inspection and Repair Fund.

(4) "Citation" means a legal notice issued by the Air Resources Board to the owner of a heavy-duty vehicle requiring the owner to repair the vehicle and to pay a civil penalty.

(5) "Defective" means a condition in which an emission control system or an emission control system component is malfunctioning due to age, wear, malmaintenance, or design defects.

(6) "Demonstration of correction" means the documents identified in section 2186~~(a) or successful completion of an ARB post-repair test or inspection~~.

(7) "Driver" has the same meaning as defined in California Vehicle Code section 305.

(8) "Emission control label" means the label required by the "California Motor Vehicle Emission Control Label Specifications", incorporated by reference in 13 CCR, section 1965, or Title 40, Code of Federal Regulations (40 CFR), section 86.085-35 or 40 CFR Part 86, Subpart A.

(9) "Emission control system" means the pollution control components on an engine at the time its engine family is certified, including, but not limited to, the emission control label.

(10) "Executive Officer" means the Executive Officer of the Air Resources Board or his or her designee.

(11) "Fleet" means two (2) or more heavy-duty vehicles.

(12) "Heavy-duty vehicle" means a motor vehicle having a manufacturer's maximum gross vehicle weight rating (GVWR) greater than 6,000 pounds, except passenger cars.

(13) "Inspection procedure" means the test procedure specified in section 2182 and the emission control system inspection specified in section 2183.

(14) "Inspection site" means an area including a random roadside location, a weigh station, or a fleet facility used for conducting the heavy-duty vehicle test procedure, emission control system inspection, or both.

(15) "Inspector" means an Air Resources Board employee with the duty of enforcing Health and Safety Code sections 43701(a) and 44011.6, and Title 13, CCR sections 2180 through 2194.

(16) "Issuance" means the act of mailing or personally delivering a citation to the owner.

(17) "Minimum penalty" means the ($300) penalty that is to be deposited in the Diesel Emission Reduction Fund pursuant to Health and Safety Code section 44011.6(*l*).

(18) "Notice of Violation" means a legal notice issued to the owner of a heavy-duty vehicle powered by a pre-1991 model-year diesel engine with a measured smoke opacity exceeding 55 percent but not exceeding 69 percent, requiring the owner to repair the vehicle and submit a demonstration of correction.

(19) "Officer" means a uniformed member of the Department of the California Highway Patrol.

(20) "Opacity" means the percentage of light obstructed from passage through an exhaust smoke plume.

(21) "Owner" means either (A) the person registered as the owner of a vehicle by the California Department of Motor Vehicles (DMV), or its equivalent in another state, province, or country; or (B) a person shown by the registered owner to be legally responsible for the vehicle's maintenance. The person identified as the owner on the registration document carried on the vehicle at the time a citation is issued shall be deemed the owner

unless that person demonstrates that another person is the owner of the vehicle.

(22) "Removal from service" means the towing and storage of a vehicle under the auspices of the Department of the California Highway Patrol.

(23) "Repair facility" means any place where heavy-duty vehicles are repaired, rebuilt, reconditioned, or in any way maintained for the public at a charge, and fleet maintenance facilities.

(24) "SAE J1667" means Society of Automotive Engineers (SAE) Recommended Practice SAE J1667 "Snap-Acceleration Smoke Test Procedure for Heavy-Duty Diesel Powered Vehicles," as issued February 1996 ("1996-02"), which is incorporated herein by reference.

(25) "Scan tool evaluation" means using an electronic device to determine if a Low NOx Rebuild Kit, as defined in section 2011(b)(4), is installed.

(25~~6~~) "Schoolbus" means the same as defined in California Vehicle Code section 545.

(26~~7~~) "Smokemeter" means a detection device used to measure the opacity for smoke in percent opacity.

(27~~8~~) "Tampered" means missing, modified, or disconnected.

(28~~9~~) "Uncleared citation" means a citation for which demonstration of correction and, if required, payment of any civil penalty, has not been made.

NOTE: Authority Cited: Sections 39600, 39601, 43013, 43701, and 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6, Health and Safety Code. Section 505, Vehicle Code.

Amend section 2181, title 13, California Code of Regulations to read as follows:

§ 2181. Responsibilities of the Driver and Inspector During the Inspection Procedure.

(a) Driver of heavy-duty diesel-powered vehicle. The driver of a heavy-duty diesel-powered vehicle selected to undergo the inspection procedure shall do all of the following:

(1) Drive the vehicle to the inspection site upon direction of an officer.

(2) Show proof of driver's license and vehicle registration to the inspector or officer upon request.

(~~2~~3) Perform the test procedure upon request by an inspector.

(~~3~~4) Open the vehicle door so that the inspector can observe the driver depress the accelerator pedal.

(~~4~~5) Permit an emission control system inspection and open the hood of the vehicle upon the request of the inspector.

(6) Permit a scan tool evaluation upon request of the inspector.

(~~5~~7) Sign the citation or notice of violation to acknowledge its receipt and the smoke test report to acknowledge performance of the test procedure.

(b) Driver of heavy-duty gasoline-powered vehicle. The driver of a heavy-duty gasoline-powered vehicle selected to undergo the inspection shall:

(1) Drive the vehicle to the inspection site upon direction of an officer.

(2) Show proof of driver's license and vehicle registration to the inspector or officer upon request.

(~~2~~3) Permit an emission control system inspection and open the hood of the vehicle upon request of the inspector.

(~~3~~4) Sign the citation to acknowledge its receipt.

(c) Inspector. The inspector in performing the inspection procedure shall do all of the following:

(1) Advise the driver that refusal to submit to the inspection procedure is a violation of these regulations

(2) Obtain engine identification information from the vehicle when tested pursuant to section 2182 to determine which opacity standard specified in section 2182 applies.

(3) Except as otherwise provided in section 2181(c)(4), issue a copy of the citation to the driver of a vehicle that fails the test procedure or the emission control system inspection.

(4) Issue a copy of the notice of violation to the driver of a vehicle powered by a pre-1991 model-year diesel engine with a measured smoke opacity exceeding 55 percent but not exceeding 69 percent, except where a notice of violation or citation has been issued for the vehicle in the preceding 12 months.

(5) Issue a warning to the owner of a heavy-duty diesel-powered vehicle missing its emission control label that the label must be replaced and the engine number identification must be provided to the ARB within 30 days of written notification by the ARB, or it will be conclusively presumed in any subsequent smoke opacity test where the emission control label remains missing that the vehicle is subject to the 40 percent smoke opacity standard in section 2182(a)(1), unless at the time of the subsequent test it is plainly evident from a visual inspection that the vehicle is powered by a pre-1991 model-year engine.

(6) Issue a copy of the citation to the driver of a 1993-1998 heavy-duty diesel-powered vehicle with a Low NOx Rebuild Engine upon determining by scan tool evaluation a violation of section 2011 (c)(1), title 13, California Code of Regulations.

NOTE: Authority Cited: Sections 39600, 39601, 43013, 43701, and 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6, Health and Safety Code. Section 305, Vehicle Code.

Amend section 2184, title 13, California Code of Regulations to read as follows:

§ 2184. Refusal to Submit to Inspection Procedure.

The refusal by an owner or driver of a vehicle to submit to the scan tool evaluation defined in section 2180.1, the test procedure in section 2182, or to the emission control system inspection in section 2183 constitutes a failure of the evaluation, test procedure, or inspection, respectively, unless the driver is cited by the California Highway Patrol for a violation of California Vehicle Code section 2813.

NOTE: Authority Cited: Sections 39600, 39601, 43013, 43701, and 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6, Health and Safety Code. Sections 305, 505, and 2813, Vehicle Code.

Amend section 2185, title 13, California Code of Regulations to read as follows:

§ 2185. Civil Penalty Schedule.

(a) The owner of a heavy-duty vehicle that fails the scan tool evaluation, the test procedure, or the emission controls system inspection, including by refusal to submit, is subject to the following penalty schedule:

(1) Scan Tool Evaluation Violation Penalties

(A) The owner of a vehicle that is cited for a violation of section 2011(c)(1), and for which demonstration of correction is provided and payment is made within 45 days from personal or certified mail receipt of the citation, shall pay a civil penalty of $300. Schoolbuses registered in California are exempt from the $300 civil penalty for the first violation only.

(B) The owner of a vehicle who violates section 2011(c)(5) shall pay a civil penalty of $500 in addition to the civil penalty for the violation of section 2011(c)(1).

(C) The owner of a vehicle cited for a violation of section 2184 for refusing to submit to a scan tool evaluation shall be subject to a civil penalty of $500.

(2) Heavy-Duty Vehicle Tampering and Opacity Violation Penalties

(~~1~~A) The owner of a vehicle, other than a schoolbus, that is cited for the first time pursuant to section 2182 or 2183 and for which demonstration of correction is provided and payment is made within 45 days from personal or certified mail receipt of the citation, shall pay the minimum penalty of $300.

(~~2~~B) The owner of a vehicle that is cited for the first time pursuant to section 2184 for a refusal not pertaining to a scan tool evaluation, or that is cited for the first time pursuant to section 2182 or 2183 and for which demonstration of correction is not provided within 45 days from personal mail or certified mail receipt of the citation shall provide demonstration of correction and pay the minimum penalty of $300 and the basic penalty of $500 for a total of $800. Schoolbuses are exempt from the $300 minimum penalty for the first violation only.

(~~3~~C) The owner of a vehicle that is cited pursuant to section 2182 or 2183 within 12 months from the issuance of the most recent citation for that vehicle shall within 45 days from personal or certified mail receipt of the

current citation provide demonstration of correction and pay the penalty of $1,500 and the minimum penalty of $300 for a total of $1,800.

(b) (1) No citation shall be issued to the owner of a heavy-duty vehicle powered by a pre-1991 model-year diesel engine on the basis of a measured smoke opacity exceeding 55 percent but not exceeding 69 percent, unless:

(A) the owner fails to provide a demonstration of correction within 45 days from personal or certified mail receipt of the notice of violation, or

(B) a notice of violation or citation has been issued for the vehicle in the preceding 12 months.

(2) The owner of a vehicle that is the subject of a notice of violation and for which demonstration of correction is provided within 45 days from personal or certified mail receipt of the notice of violation shall not be subject to a penalty for the violation.

(3) The owner of a vehicle that is initially subject to a notice of violation, but is cited after a demonstration of correction is not provided within 45 days from personal or certified mail receipt of a notice of violation, shall be subject to the penalty in section 2185(a)(2)(B).

(4) (A) Where a heavy-duty vehicle with a pre-1991 engine inspected in accordance with section 2181 has a measured opacity exceeding 55 percent but not exceeding 69 percent within 12 months of issuance of a notice of violation for which a demonstration of correction was timely provided within the applicable 45-day period, a citation shall be issued and the owner shall be subject to the penalty in section 2185(a)(2)(B).

(B) Where a heavy-duty vehicle with a pre-1991 engine inspected in accordance with section 2181 has a measured opacity exceeding 55 percent but not exceeding 69 percent within 12 months of issuance of a notice of violation for which a demonstration of correction was not timely provided within the applicable 45-day period, a citation shall be issued and the owner shall be subject to the penalty in section 2185(a)(~~3~~2)(C).

(c) If a vehicle fails the test procedure or an emission control system inspection one year or more after the date of its most recent failure, the owner of that vehicle shall be subject to the penalty schedule in section 2185(a)(~~1~~2)(A) and (a)(2)(B).

(d) When a vehicle is cited after a bona fide change of ownership between non-related persons or entities, the new owner shall be subject to the penalty schedule in section 2185(a)(~~1~~2)(A) and (~~2~~B) if the only citations issued for the vehicle within the previous 12 months were issued prior to the change of ownership to the new owner.

(e) An owner who has been cited twice or more for tampered emission controls on the same vehicle shall be subject to the penalty in section 2185(a)(~~3~~2)(C), notwithstanding section 2185(c).

NOTE: Authority Cited: Sections 39600, 39601, 43013, and 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, and 44011.6, Health and Safety Code. Sections 305, 505, and 545, Vehicle Code.

Amend section 2186, title 13, California Code of Regulations to read as follows:

§ 2186. Demonstration of Correction and Post-Repair Test or Inspection.

(a) Demonstration of Correction. The owner ~~may~~ must demonstrate correction of the vehicle by submitting to the Air Resources Board the following documents (1) or (2):

(1) Where repairs are made at a repair facility, a repair receipt or a completed work order which contains the following information:

(A) Name, address, and phone number of the facility;

(B) Name of mechanic;

(C) Date of the repair;

(D) Description of component replacement(s), repair(s), and/or adjustment(s); and

(E) Itemized list of replaced component(s), including description of part, part number, and cost~~.~~;

(2) Where the owner makes his or her own repairs outside of a repair facility,

(A) An itemized receipt for the parts used in the repair, and

(B) A statement identifying the date and nature of the repairs made~~.~~;

(b) Statement of Correction. The owner must also submit to the Air Resources Board the following documents (1) or (2) or (3):

(~~3~~1) Where the citation or notice of violation was based on a failure to meet the opacity standard applicable under section 2182, a smoke test report from a subsequent test showing that the repaired vehicle passed the applicable section 2182 standard along with a statement to that effect made under penalty of perjury by the person who conducted the subsequent test~~.~~;

(~~4~~2) Where the citation was based on a failure to pass an emission control system inspection as specified in section 2183, a statement by a person, under penalty of perjury, that the person has reinspected any components identified in the citation as defective or tampered and has determined that these components are in good working order~~.~~; or

(3) Where the citation was based on a violation of the Low NOx Rebuild Kit installation requirement as specified in section 2011(c), a statement by a person, under penalty of perjury, that the person has conducted a scan tool evaluation and has determined that the Low NOx Rebuild Kit has been installed.

~~(b) In lieu of submitting the documents identified under section 2186(a), the owner may demonstrate correction of the vehicle by submitting it to an ARB post-repair test or an ARB post-repair inspection.~~

(c) Demonstration of Correction Form. For (a) and (b) above, the citee shall complete and attach a Demonstration of Correction Form (provided by the ARB) to demonstrate that the citee's vehicle has been repaired and is now in compliance.

(~~c~~d) The Air Resources Board shall require an ARB post-repair test or an ARB post-repair inspection whenever:

(1) a submitted repair receipt or work order does not comply with (a) above;

(2) a repair receipt or work order appears to be falsified; or

(3) a second and subsequent failures of the test procedure or an emission control system inspection on the vehicle occur within a one-year period.

NOTE: Authority Cited: Sections 39600, 39601, 43013, 43701, 44011.6, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39033, 43000, 43013, 43018, 43701, and 44011.6, Health and Safety Code. Section 505, Vehicle Code.

Amend section 2192, title 13, California Code of Regulations to read as follows:

§ 2192. Vehicle Inspection Responsibilities.

(a) The owner of a heavy-duty diesel-powered vehicle subject to the requirements of this chapter shall do all of the following:

(1) Test the vehicle for excessive smoke emissions periodically according to the inspection intervals specified in section 2193(a), (b), and (c).

(2) Measure the smoke emissions for each test using the test procedure specified in section 2193(e).

(3) Record the smoke test opacity levels and other required test information as specified in section 2194.

(4) Have the vehicle repaired if it exceeds the applicable smoke opacity standard specified in section 2193(e).

(5) Record the vehicle repair information as specified in section 2194.

(6) Conduct a post-repair smoke test to determine if the vehicle complies with the applicable smoke opacity standard.

(7) Record the post-repair smoke test results as specified in section 2194.

(8) If the vehicle does not comply with the applicable smoke opacity standard after the test required by section 2192(a)(7), make additional repairs to achieve compliance, and record the smoke test results as specified in section 2194.

(9) Ensure that Low NOx Rebuild Kits are installed in 1993 – 1998 heavy-duty diesel-powered vehicles with Low NOx Rebuild Engines as required by section 2011.

(~~9~~10) Keep the records specified in section 2194 for two years after the date of inspection.

(1~~0~~1) Permit an Air Resources Board inspector to review the inspection records specified in section 2194 at owner/operator designated fleet locations by appointment.

NOTE: Authority Cited. Sections 39600, 39601, and 43701(a), Health and Safety Code. Reference: Sections 39002, 39003, 39033, 43000, 43016, 43018, 43701(a), and 44011.6, Health and Safety Code.

Amend section 2194, title 13, California Code of Regulations to read as follows:

§ 2194. Record Keeping Requirements.

(a) The owner of a vehicle subject to the requirements of this chapter shall record the following information when performing the smoke opacity testing:

(1) The brand name and model of the opacity meter.

(2) ~~The brand name and model of the strip chart recorder, if an SAE J1243 type smoke meter is employed.~~

(~~3~~) The dates of last calibration of the opacity meter and chart recorder.

(~~4~~3) The name of the smoke meter operator who conducted the test.

(~~5~~4) The name and address of the contracted smoke test facility or vehicle repair facility that conducted the test (if applicable).

(~~6~~5) The applicable smoke opacity standard for the tested vehicle.

(~~7~~6) Vehicle identification number, vehicle's engine year, engine make, and engine model, and test date. Fleet-designated vehicle identification numbers are also acceptable.

(~~8~~7) The initial smoke test opacity levels (for three successive test readings).

(~~9~~8) An indication of whether the vehicle passed or failed the initial smoke test.

(~~10~~9) The post-repair test date.

(~~11~~10) The post-repair smoke test opacity levels (for three successive test readings).

(~~12~~11) An indication of whether the vehicle passed or failed the post-repair smoke test.

(~~13~~12) For vehicles that have failed the smoke test and have been repaired, the vehicle repair information specified in section 2186(a), Title 13, California Code of Regulations.

(b) The owner of a vehicle subject to the requirements of this chapter shall record the following information to demonstrate installation of Low NOx Rebuild Kits:

(1) A repair receipt or completed work order which contains the following information:

(A) Name, address, and phone number of the facility performing the installation;

(B) Name of the person performing the installation;

(C) Date of the installation;

(D) Description of Low NOx Rebuild Engine, including engine model and engine family number, and Low NOx Rebuild Kit installed.

NOTE: Authority Cited: Sections 39600, 39601, and 43701, Health and Safety Code. Reference: Sections 39002, 39003, 39033, 43000, 43018, 43701, and 44011.6, Health and Safety Code.

ATTACHMENT C

DESCRIPTIVE LIST OF REGULATORY TEXT CHANGES PROPOSED FOR THE HEAVY DUTY VEHICLE ROADSIDE INSPECTION PROGRAM AND THE HEAVY DUTY VEHICLE FLEET INSPECTION PROGRAM

Section 2180.1. Definitions

(a)(1) *Non-policy change*. The words "issued under section 2185 (a)(2)(C)" have been added for further clarification.

(a)(2) *Non-policy change*. The words "issued under section 2185 (a)(2)(C)" have been added for further clarification.

(a)(6) *Non-policy change*. The words "or successful completion of an ARB post-repair test or inspection have been deleted since the owner must demonstrate correction of the vehicle as outlined in sections 2186 (a), (b) and (c).

(a)(25) *Policy change.* Added definition for Scan Tool Evaluation to describe how inspectors will evaluate vehicles for low NOx software.

(a)(26)-(29) *Non-policy change*. Renumbering remaining definitions to accommodate additional definition.

Section 2181. Responsibilities of the Driver and Inspector During the Inspection Procedure.

(a)(2) *Policy change.* The original regulations did not expressly require that the citee show proof of driver's license and vehicle registration to an ARB officer/inspector. Specific language to be inserted between (a)(1) and (a)(2), thus making a total of seven items under section 2181 (a).

(a)(5) *Policy change.* The original regulations did not expressly require that the citee open the vehicle hood.

(a)(6) *Policy change*. Additional language to support inspections for low NOx software installed in vehicle engines.

2181 (a) *Non-policy change*. Renumbering items under section 2181(a) to accommodate additional language.

(b)(2) *Policy change.* The original regulations did not expressly require that the citee show proof of driver's license and vehicle registration to an ARB officer/inspector. Specific language to be inserted between (2) and (3) (b), thus making a total of four items under section 2181(b).

(b)(3) *Policy change.* The original regulations did not expressly require that the citee open the vehicle hood.

2181 (b) *Non-policy change*. Renumbering items under section 2181(a) to accommodate additional language.

2181(c)(6) *Policy change*. Add language to allow issuing a citation for failure to have low NOx software installed on eligible engines by the required implementation date.

2184. *Policy change*. Insert additional words to include the scan tool evaluation for low NOx software in the list of refusals that trigger an automatic failure.

Section 2185. Civil Penalty Schedule.

(a) *Policy change.* Include 'the scan tool evaluation' with the test procedure and the emission controls system inspection as an item subject to failure and penalties.

(a)(1) *Non-policy change.* Insert a heading and accompanying language to clarify differences in violation penalties between a low NOx software installation failure and failure of a snap idle test.

(2) *Non-policy change.* In order to improve the organization of section 2185, the title has been added to subsection (2) for clarification and consistency with section 2185 (a)(1) and the previous contents of (a)(2), (3), and (4) have been consolidated into (a)(2)(A), (B) and (C).

(b)(3), (4)(A), (4)(B), (c), (d), and (e) *Non-policy change.* In order to improve the organization of section 2185, the references have been changed to agree with the renumbering and relettering of the contents of (a)(2)(A), (B) and (C).

Section 2186. Demonstration of Correction and Post-Repair Test or Inspection.

(a) *Non-policy change.* In order to improve the organization of section 2186 a subtitle has been inserted into subsection (a) along with clarifying language, a subtitle was added in section (b), and former subsections (a)(3), (4) and (5) have been reordered into (b)(1), (2) and (3).

(b)(3) *Policy change.* Additional language to support installations of low NOx software in vehicle engines.

(b) *Policy change.* This language is being deleted since the owner must demonstrate correction of the vehicle as outlined in sections (a), (b) and (c) of this section.

(c) *Policy change.* The original regulations did not expressly require that the citee complete and attach a Demonstration of Correction Form to demonstrate that the cited vehicle has been repaired and is now in compliance. This section is now labeled (c).

Section 2192. Vehicle Inspection Responsibilities.

(a)(9) *Policy change.* Add language to incorporate the low NOx software installation inspection.

(a) *Non-policy change.* Renumber remaining items in this section to accommodate added language.

Section 2194. Recordkeeping Requirements.

(a)(2) *Non-policy change.* Language clean-up to reflect current circumstances (i.e. strip chart recorder's are no longer used.

(b) *Policy change.* Add recordkeeping requirements for the low NOx software installation.