Engine Certification

April 2008
Kathleen Mead, Manager
Retrofit Implementation Section

California Environmental Protection Agency
Air Resources Board
Today’s Presentation

- Engine Certification Process
- After Market Parts Exemption
- Verified Diesel Emission Control Systems (VDECS)
- In Use Fleet Regulations
- Statewide Bus and Truck Regulation
Engine Certification Overview

- Demonstrate exhaust system durability and emissions with standards
- Executive Order (EO) is issued
  - Engine Family Name
  - Includes pertinent engine and emissions information
- California or 50-state certification required

Engine Certification Information:
www.arb.ca.gov/msprog/onroad/cert/cert.php
Pursuant to the authority vested in the Air Resources Board by Health and Safety Code Division 26, Part 5, Chapter 2, and pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: The engine and emission control systems produced by the manufacturer are certified as described below for use in on-road motor vehicles with a manufacturer's GVWR over 14,000 pounds. Production engines shall be in all material respects the same as those for which certification is granted.

Following are: 1) the FTP exhaust standards, or if applicable, the applicable California emission standards and test procedures for heavy-duty diesel engines and vehicles (Test Procedures); and 3) the corresponding certification levels, in g/hp-hr, for this engine family. “Diesel” CO, EURO and NTE certification limits may have been demonstrated by the manufacturer as provided under the applicable Test Procedures. In lieu of testing. (For flexible- and dual-fueled engines, the CERT values in brackets () are those when tested on conventional fuel. For multi-fueled engines, the STD and CERT values for default operation permitted in 13 CCR 1956.1 or 13 CCR 1956.8 are in parentheses.)

BE IT FURTHER RESOLVED: Certification to the FEL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(s) is the emission level declared by the manufacturer and serves in lieu of an emission standard for certification purposes in any averaging, banking, or trading (ABT) programs. It will be used for determining compliance of any engine in this family with compliance with such ABT programs.

BE IT FURTHER RESOLVED: The listed engine models have been certified to the split engine family standards under 13 CCR 1956.8(b) [Diesel engines] or 13 CCR 1956.8(d) [Otto engines] and the incorporated 40CFR 60.007-15(m)(9).

BE IT FURTHER RESOLVED: For the listed engine models the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR 1965 (emission control labels) and 13 CCR 2035 et seq. (emission control warranty).

The Bureau of Automotive Repair will be notified by copy of this Executive Order.

The undersigned Executive Order must conform to all applicable California emission regulations.

Annette Hebert, Chief
Mobile Source Operations Division

Executed at El Monte, California on this 2nd day of March 2007.

Annette Hebert, Chief
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<table>
<thead>
<tr>
<th>MODEL YEAR</th>
<th>ENGINE FAMILY</th>
<th>ENGINE SIZES (L)</th>
<th>FUEL TYPE</th>
<th>STANDARDS &amp; TEST PROCEDURE</th>
<th>INTENDED SERVICE CLASS</th>
<th>ECS &amp; SPECIAL FEATURES</th>
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<tr>
<td>2007</td>
<td>7CEXH0505CAA</td>
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<td>Diesel</td>
<td>MHDD</td>
<td>DDI, TC, CAC, ECM, EGR, PTOX, OC</td>
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ENGINE (L):

8.3

ENGINE MODELS / CODES (rated power, in hp):

ISC 360 / 8788; FR91902 (350)
Exhaust Emissions Standards (Diesel Fuel)

Following are: 1) the FTP exhaust emission standards, or family emission limit(s) as applicable, under 13 CCR 1956.1 (urban bus) or 13 CCR 1956.8 (other than urban bus); 2) the EURO and NTE limits under the applicable California exhaust emission standards and test procedures for heavy-duty diesel engines and vehicles (Test Procedures); and 3) the corresponding certification levels, in g/bhp-hr, for this engine family. "Diesel" CO, EURO and NTE certification compliance may have been demonstrated by the manufacturer as provided under the applicable Test Procedures in lieu of testing. (For flexible- and dual-fueled engines, the CERT values in brackets [ ] are those when tested on conventional test fuel. For multi-fueled engines, the STD and CERT values for default operation permitted in 13 CCR 1956.1 or 13 CCR 1956.8 are in parentheses.)

<table>
<thead>
<tr>
<th></th>
<th>NMHC</th>
<th>NOx</th>
<th>NMHC+NOx</th>
<th>CO</th>
<th>PM</th>
<th>HCHO</th>
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</table>

BE IT FURTHER RESOLVED: Certification to the FEL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(s) is the emission level declared by the manufacturer and serves in lieu of an emission standard for certification purposes in any averaging, banking, or trading (ABT) programs. It will be used for determining compliance of any engine in this family and compliance with such ABT programs.

BE IT FURTHER RESOLVED: The listed engine models have been certified to the split engine family standards under 13 CCR 1956.8(b) [Diesel engines] or 13 CCR 1956.8(d) [Otto engines] and the incorporated 40 CFR 86.007-15(m)(9).

BE IT FURTHER RESOLVED: For the listed engine models the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR 1965 (emission control labels) and 13 CCR 2035 et seq. (emission control warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.
Exhaust Emissions Standards (CNG Fuel)

<table>
<thead>
<tr>
<th></th>
<th>NMHC</th>
<th>NOx</th>
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<th>CO</th>
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</table>

*NMHC*: Non-methane hydrocarbons; *NOx*: Oxides of nitrogen; *CO*: Carbon monoxide; *PM*: Particulate matter; *HCHO*: Formaldehyde.

*FTP*: Federal Test Procedure; *EURO*: Euro III European Steady-State Cycle; *NTE*: Not-to-Exceed; *STD*: Standard or emission test cap;

*FEL*: Family emission limit; *CERT*: Certification level.

**Notes:**
- g/bhp-hr = grams per brake horsepower-hour;
- FTP = Federal Test Procedure;
- EURO = Euro III European Steady-State Cycle;
- NTE = Not-to-Exceed;
- STD = Standard or emission test cap;
Average, Banking & Trading (ABT) Program

- Title 13, California Code of Regulations, section 1956.8
- 2007+ model year engines with certified above 0.01g PM standard
- Additional PM and NOx control needed?
<table>
<thead>
<tr>
<th>Model Year</th>
<th>Make/Model</th>
<th>Service Class</th>
<th>Engine Family Name</th>
<th>Executive Order Number</th>
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<tbody>
<tr>
<td>2007</td>
<td>Cummins ISM</td>
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### Exhaust Emissions Standards (ABT Engine-Diesel Fuel)

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<th>g/bhp-hr</th>
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<th>NOx</th>
<th>NMHC+NOx</th>
<th>CO</th>
<th>PM</th>
<th>HCHO</th>
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</thead>
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</table>

* g/bhp-hr=grams per brake horsepower-hour; FTP=Federal Test Procedure; EURO=European Standards; CO=carbon monoxide; PM=particulate matter; HCHO=formaldehyde;
Aftermarket Parts Exemption

• California’s anti-tampering law
  - Prohibits modifying or tampering with an engine or exhaust system
• Exemption for use of non-OEM engine and exhaust system parts

Aftermarket, Performance and Add-on Parts info:
www.arb.ca.gov/msprog/aftermkt/aftermkt.htm#ca
Verified Diesel Emission Control Systems

- DECS
  - Level 1, 2, & 3 PM Control
  - NOx Reduction
- Verified Emission Reduction
- Warranty
- Aftermarket Parts Exemption

Currently Verified DECS:
www.arb.ca.gov/diesel/verdev/vt/cvt.htm
In-Use Fleet Regulations
In-Use Fleet Regulations

- Solid Waste Collection Vehicle
- Public Transit Agencies
  - UB and TFV requirements
- Public Agencies and Utilities
- In-Use Off Road Mobile Equipment
- Statewide Truck and Bus Regulation (in development)
What is BACT?

• Retire
  – low-usage, scrap, sale/operated out-of-state

• Repower
  – Engine meeting 0.01g/bhp-hr PM, clean gasoline, alternative fuel
  – Existing Alternative Fuel OK (2004-2006 MY must meet 1.8g/bhp-hr NOx Optional Standard or less)

• Retrofit
  – Highest level Diesel Emission Control Strategy
Statewide Truck & Bus Regulation

Concrete Mixer

Dump Truck

Drill Rig

Water Truck

Hay Squeeze

Tow Truck

Reefer Van

Fuel Tank Truck

Passenger Bus
Statewide Truck & Bus Regulation Scope

- Diesel vehicles operating in California
  - Trucks, buses, yard trucks, other
  - Interstate, intrastate, international
- Shuttle Vehicles - Any GVWR which transports passengers for hire
- Vehicles greater than 14,000 GVWR
- Any person, business, or government agency who owns or sells a vehicle in California
Excluded from Scope of Regulation

- Pickups and other vehicles with GVWR less than 14,000 lbs except shuttle buses
  - Regardless of towing capability or combined weight rating
- Emergency vehicles
- Tactical military vehicles
- Personal use motor homes
Statewide Truck & Bus Regulation

- Upgrade requirements phase-in 2010-2021
  - 2007 model year engine emissions (2010-2013)
  - 2010 model year engine emissions (2017-2021)
- Exhaust retrofits if equivalent emissions
- Compliance Approach
  - Best available control technology schedule or
  - Fleet average
- Certain special provisions
Upcoming Public Workshops

• To discuss revised proposed regulatory language, preliminary results from vehicle surveys, economic impacts, inventory, and additional outreach efforts

• Six Rounds of Workshops
  – Twenty-Four meetings since April 2006

• Next Workshops
  – Late May/Early June & July

Statewide Truck and Bus Regulation
www.arb.ca.gov/msprog/onrdiesel/workshops.htm
www.arb.ca.gov/dieseltruck
Hotline #: 1-866-6Diesel
## ARB Listserver Website

www.arb.ca.gov/listserv/listserv.php

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Email List</th>
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<tbody>
<tr>
<td>Solid Waste Collection:</td>
<td>swcv</td>
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<tr>
<td>Public Transit Agencies:</td>
<td>bus-tfv</td>
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<tr>
<td>Public Agencies and Utilities:</td>
<td>bus-ub</td>
</tr>
<tr>
<td>In-Use Off Road:</td>
<td>publicfleets</td>
</tr>
<tr>
<td>Statewide Truck &amp; Bus:</td>
<td>ordiesel</td>
</tr>
<tr>
<td></td>
<td>onrdiesel</td>
</tr>
</tbody>
</table>
Diesel Programs and Activities
www.arb.ca.gov/diesel/diesel.htm

Kathleen Mead
Manager, Retrofit Implementation Section
(916) 324-9550; kmead@arb.ca.gov

Eric Bissinger, Urban Bus Requirements
(916) 324-9424; ebissing@arb.ca.gov

Adam Gerber, TFV Requirements
(916) 323-5445; agerber@arb.ca.gov

Tony Brasil, Manager
In-Use Control Measures Section
(916) 323-2927; abrasil@arb.ca.gov
Statewide Truck and Bus Regulation - www.arb.ca.gov/dieseltruck
Hotline # : 1-866-6Diesel
Questions ?