Proposed Engine Manufacturer Diagnostic (EMD) System Regulation

Mobile Source Control Division
California Air Resources Board

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Sacramento, California

Diagnostic Systems

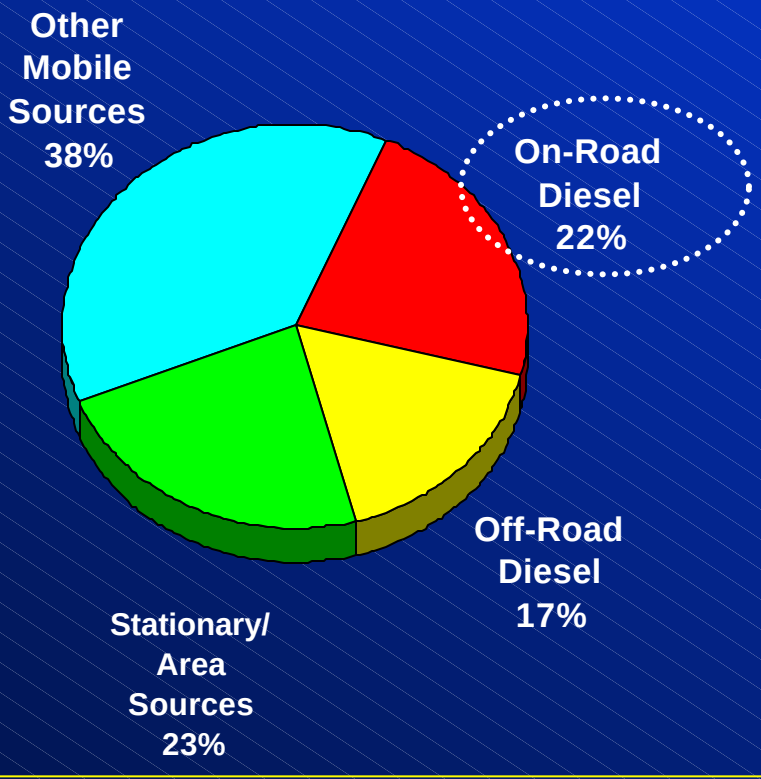
- Comprised of an on-board computer, input and output components, and software routines
- Use information from the input components to detect malfunctions of emission controls
- Illuminate warning light and store fault information for repair technicians
- Already implemented on light- and medium-duty vehicles since 1996 model year (OBD II)

Reasons for EMD

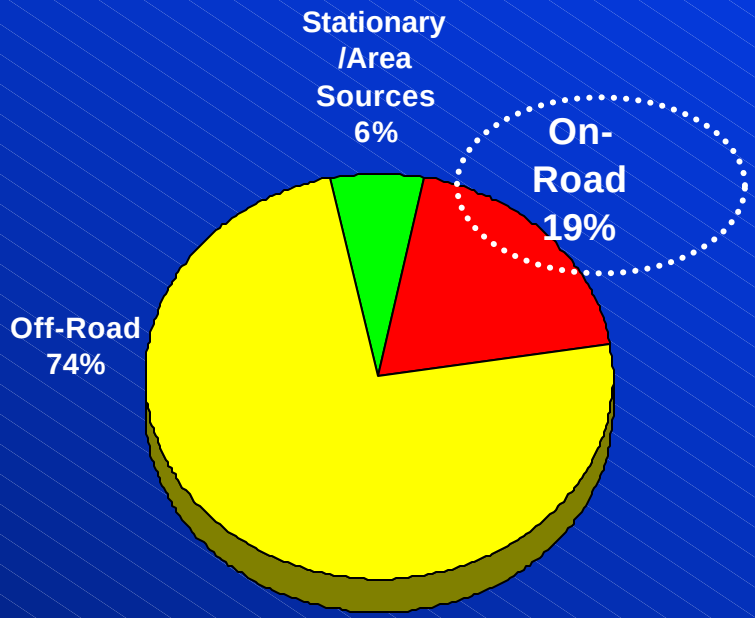
- Heavy-duty diesel trucks account for a substantial portion of oxides of nitrogen (NOx) and particulate matter (PM) emissions
- More stringent on-road heavy-duty engine emission standards being phased in starting in 2007
  - new or improved emission control technologies will be used to meet the standards
- No existing diagnostic requirements
  - EMD would ensure that these emission controls are working properly

NOx and PM Emissions in 2010

NOx



Diesel PM



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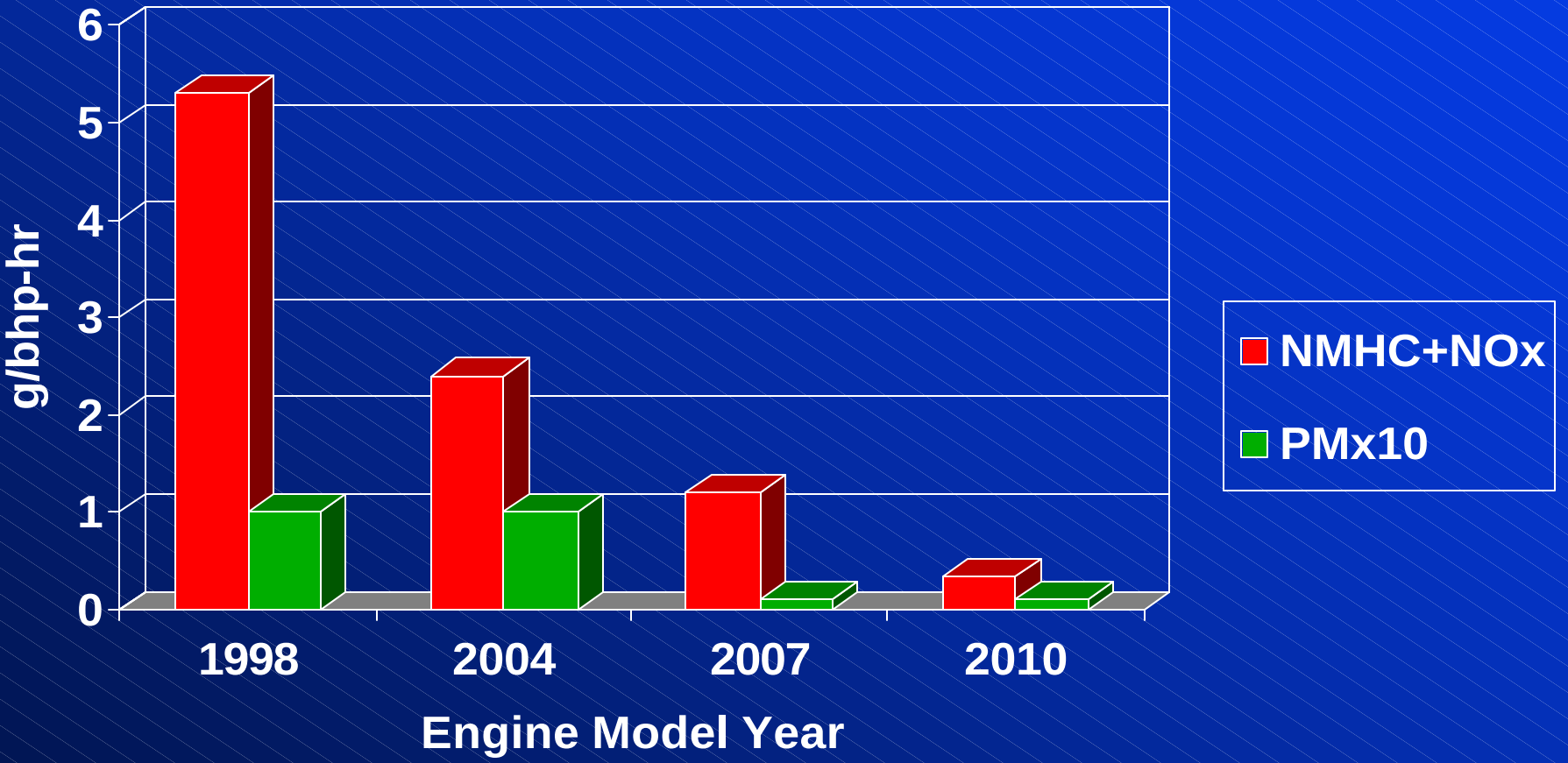
On-Road Heavy-Duty Diesel Emission Standards Becoming More Stringent



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Proposed EMD Regulation

- Would apply to:
  - On-road heavy-duty engines
  - 2007 and subsequent model years
- Targets major emission control components
- Builds on the existing manufacturer's diagnostic systems on heavy-duty engines

Proposed Monitoring Requirements

- Functional monitoring of following components required:
  - fuel system
  - exhaust gas recirculation system
  - PM trap
- Monitors calibrated to design limits, not to emission thresholds

Proposed Monitoring Requirements (cont.)

- Monitoring of electronic components (e.g., sensors, valves) that are :
  - “emission-related” or
  - used for other EMD monitors
- Monitors check for circuit faults and proper function

Additional Requirements

- Alert the vehicle operator via a warning light
- Store information about the detected malfunction for repair technicians

Cost Effectiveness of Proposed Requirements

- Virtually no additional cost expected
  - EMD system makes use of sensors and software already added to meet tailpipe standards
- Proposed requirements retain the cost-effectiveness of the 2007 tailpipe standards:
  - $0.42/lb of NOx+NMHC and $3.42/lb of PM
  - Assumes EMD helps protect emission benefits already expected from 2007 tailpipe standards

Future Regulation Proposal

- EMD is a first step towards a comprehensive heavy-duty diagnostic regulation
- Staff anticipates a proposal for Board consideration in 2005
  - More like the current OBD II regulation.
- Will require:
  - Comprehensive monitoring of all emission-control components/systems.
  - Monitors tied to emission levels.
  - Standardization requirements

Summary

- Heavy-duty emission standards becoming more stringent starting in 2007
- Proposed EMD regulation necessary interim step to help maintain low emissions
- Staff to propose comprehensive heavy-duty diagnostic regulation in 2005