

On-Board Diagnostics Regulatory Update



California Air Resources Board
Mobile Source Control Division

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Sacramento, California

Today's Presentation

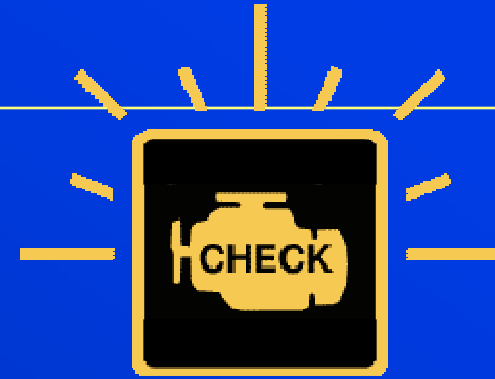
- Background
- Proposed Amendments
- Enforcement Regulation
- Cost Effectiveness

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Background

- On-Board Diagnostic (OBD) systems
 - Mostly software in engine computer
 - Illuminates 'check engine light'
- OBD II
 - On passenger cars, trucks, SUVs since 1996
- Heavy-Duty (HD OBD)
 - Starts on 2010 and newer HD engines



Where we are today

- 130+ million OBD II equipped cars in the U.S.
 - More than 50% of the in-use fleet
- 25 states in the U.S. using OBD II for I/M, including CA
 - Over 18,000 OBD II inspections a day just in CA
- First HD OBD engines to be launched next year

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Reasons for Changes

- Keep pace with technology
- SmogCheck and technician feedback and experience
- Certification staff experience
- Review previous round of adopted requirements
 - First review of HD OBD since adoption in 2005

Regulatory Development

- Regulatory update work started in 2007
- Numerous meetings with industry
 - HD engine manufacturers, associations (e.g., EMA), suppliers
- Draft regulation released for Oct. 2008 workshop
- Draft enforcement regulation released Dec. 2008
- Primary stakeholders affected by regulations:
 - EMA, AAM, AIAM
 - Vehicle owners, repair technicians

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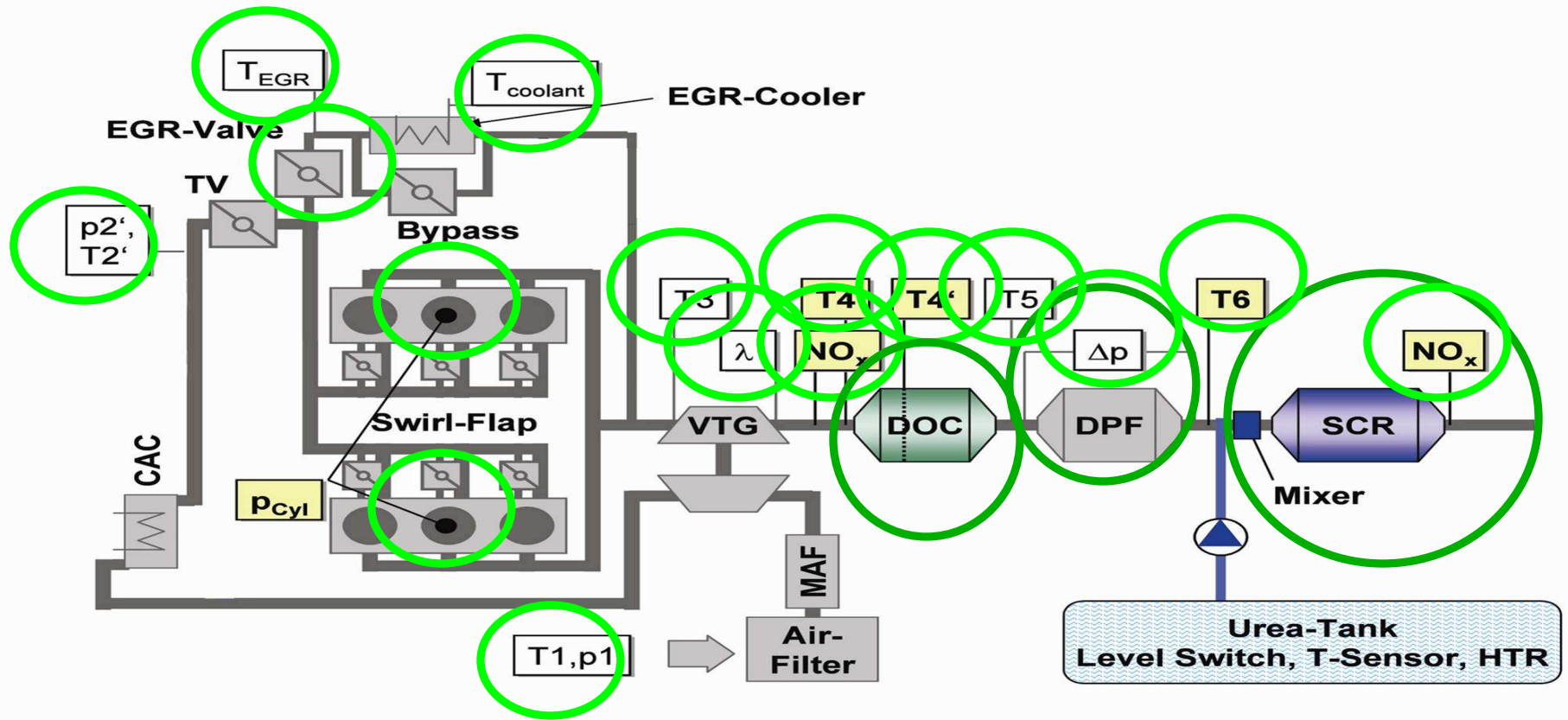
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Typical Diesel Emission Controls

- have become increasingly complex
- need to work for ~1,000,000 miles



HD OBD

Diesel Amendments Summary

- Laundry list of smaller amendments
 - Clarifications, delays of specific requirements
- Reduced monitoring stringency
 - Relax 2010-2012MY thresholds for:
 - PM filter, NO_x catalyst (e.g., SCR), and NO_x sensors
 - Modified to reflect current state of technology

HD OBD

Diesel Amendments Summary

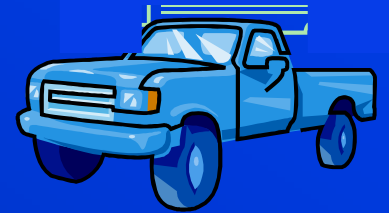
- Added requirements:
 - New emission controls or additional failure conditions
 - Leadtime provided as necessary
- Items include:
 - Any form of emission control strategies
 - Cold start emission controls
 - Improved cooling system monitoring
 - Additional standardized data for scan tools

Other Changes

- Number of requested changes rejected
 - E.g., relaxation of NMHC catalyst threshold
 - Most manufacturers on track to meet current requirement so no adjustment for technical feasibility
- Some changes reflect partial compromise
 - Requirement to account for adjustment factors kept
 - But less rigorous calculation procedure allowed and additional guidance to be provided in a mail-out

OBD Harmonization

- Currently, two different OBD regulations
 - OBD II for light- and medium-duty vehicles
 - HD OBD for heavy-duty vehicles
- Some products span medium- and heavy-duty classes
- Proposed amendments modify both regulations to harmonize as much as possible



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Enforcement Regulation Overview

- Ensures OBD system works correctly in-use
 - Stand-alone enforcement regulation
 - Very similar to existing light-duty regulation
- Details enforcement procedures
 - Vehicle/engine sampling
 - Pass/fail criteria
 - Relaxed in early years
 - Remedial action up to fines and recalls
 - Mandatory recall for most egregious cases

Enforcement Regulation

Manufacturer self-testing

- Requires emission testing
 - Engine-based (not vehicle) testing
- Requires manufacturers to do the testing
 - Procure and test limited number of engines
 - 1-3 engines per year (1 for most)
 - Additional 'like' engines tested if 1st one fails
 - Report results to ARB
- Basis for enforcement action if OBD system doesn't work

Enforcement Regulation

Industry Comments

- Imposes significant added cost and workload
- Recall jeopardy for self-testing inappropriate
 - Question legal authority
- Staff Response:
 - Testing necessary based on light-duty experience
 - Cost calculated at < \$2/engine sold
 - Small fraction of certified engine families tested
 - Recall is appropriate for serious non-compliances
 - Jeopardy limited in early years
 - Within ARB authority to ensure compliance
 - 4+ existing regulations require self-testing

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Cost Effectiveness of Proposed Requirements

- Minimal change to original cost calculations
 - Updated total cost for HD OBD = \$134/engine
 - < 2% retail price of engine
 - Includes cost for new enforcement testing
- Emission benefits:
 - ~3 tpd ROG, 38 tpd NO_x, 0.4 tpd PM in 2020
- Cost-effectiveness very good:
 - \$0.15/lb of ROG+NO_x and \$22.50/lb of PM
 - Cost includes repair costs

Summary

- Proposed amendments necessary to ensure emissions remain low for entire life
- Proposed enforcement regulation essential for an effective HD OBD program
- Staff recommends adoption of amendments and enforcement regulation
 - With 15-day changes