

Proposed Modifications to the Low-Emission Vehicle Program

FACA Subcommittee
on Mobile Sources

October 14, 1998
El Monte, California
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California Environmental Protection Agency
Air Resources Board

LEV Program Background

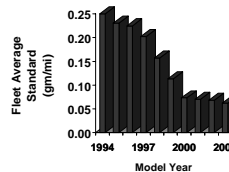
- Adopted in September 1990
- Implementation began in 1994
- Capability of emission control technology has exceeded ARB's projections
- Has ultimately been shown to be very cost effective

LEV I Standards (g/mi)

| Category | NMOG* | CO | NOx |
|----------|-------|------|------|
| Tier I | 0.25 | 3.4 | 0.4 |
| TLEV | 0.125 | 3.4 | 0.4 |
| LEV | 0.075 | 3.4 | 0.2 |
| ULEV | 0.040 | 1.7 | 0.2 |
| ZEV | zero | zero | zero |

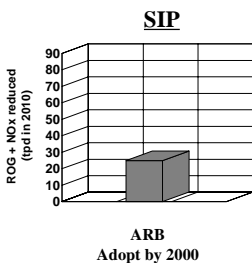
* Based on conventional gasoline - clean fuel values determined by adjusting for ozone reactivity

LEV I Implementation



- Sales moving to all LEV
 - 1997: 46% LEVs
 - 1998: 70% LEVs
- First ULEV
 - 1998 Accord EX
- ZEV MOA

M2 - Advanced Technology for Light-Duty Vehicles



SIP

Status

- Regulatory development in progress
- Board hearing 11/98
- M2 calls for 25 tpd emission reduction - target likely to be exceeded

LEV II Proposal

- New Emission Standards
 - 0.05 g/mi NOx - LEV, ULEV
 - Lower PM standard for diesels
 - New SULEV standard for PCs and LDTs
 - 120,000 mile durability standard
 - Optional 150,000 mile standard
- New light-duty truck category (LDT2)
- New lower fleet averages for PCs and LDTs
- Lower evaporative emissions
- Partial ZEV credits for qualifying technologies

**PROPOSED EMISSION STANDARDS
Passenger Cars and Light-Duty Trucks
0-8500 lbs. GVW**

| | | | | | |
|-------|------|-------|------|------|------|
| | | | | | |
| | 120K | | | | 0.04 |
| | | | | 0.05 | |
| | 120K | | 0.07 | 0.01 | |
| | | | 0.05 | | |
| | 120K | | 0.07 | 0.01 | |
| SULEV | 120K | 0.010 | 1.0 | 0.02 | 0.01 |

* Diesel only
** Proposed standards in bold type

**0.05 g/mi NOx
(LEVs, ULEVs)**

- LEV II emphasis is on NOx reductions
- Four year phase-in beginning in 2004
- Test program has been conducted to demonstrate low NOx feasibility

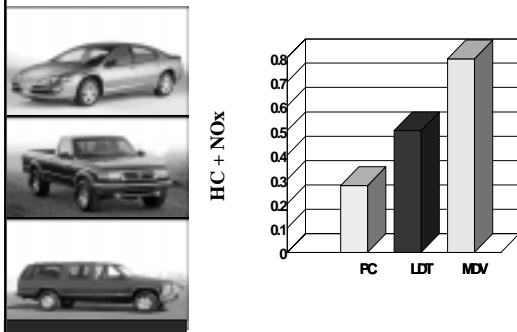
Proposed SULEV Standard

- Emission Standards:
 - 0.01 g/mi NMOG;
 - 1.0 g/mi CO;
 - 0.02 g/mi NOx
- 120,000 mile standard

**Expanded Light-Duty Truck
Category (LDT2)**

- Restructured to include heavier light-duty trucks and sport utility vehicles currently used for personal transportation
- LDT2 = 3751 lbs. LVW - 8500 lbs. GVWR
 - Includes vehicles currently in MDV1, MDV2, and MDV3 categories
 - Emission standards same as PC and LDT1
- Slightly higher NOx standard for true work trucks
- ARB test program on LDT2s to demonstrate feasibility of new standards

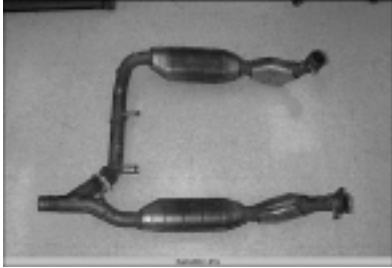
**Comparative Emission Standards
PCs, LDTs, MDVs**



ARB Test Vehicles



Advanced Catalyst System



Proposed Fleet Average Requirement

- PCs and LDT 0-3750 lbs.:
 - Decreasing from 0.062 in 2003 to 0.035 in 2010
- LDT2s 3751 lbs LVW - 8500 lbs GVW:
 - Decreasing from 0.093 in 2003 to 0.043 in 2010

Evaporative Requirements

- Lower evaporative standards
- Increased durability: 15 yrs./150K miles
- Applicable to PCs, LDTs, MDVs, and HDVs
- Gasoline-fueled, LPG-fueled, alcohol-fueled, HEVs, and ZEVs with fuel-fired heaters
- Phase-in beginning in 2004 MY
- Optional zero-evaporative standards for SULEVs that receive partial ZEV credit

Partial ZEV Credit Proposal

- Only vehicles that meet all of the following requirements would qualify to receive partial ZEV credit:
 - SULEV standard at 150,000 miles and associated OBD II requirements
 - Zero-fuel evaporative emissions
 - 150,000 mile emission warranty
- Amount of credit is dependent on zero emission VMT, fuel cycle emissions
- Minimum of 40% must be pure ZEVs for large manufacturers

Maximum Partial ZEV Credit

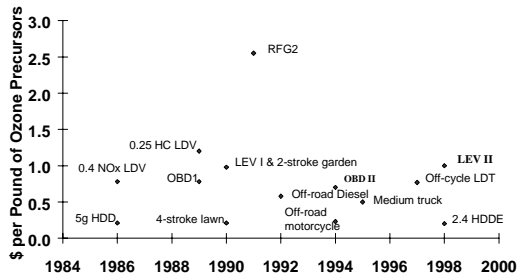
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Partial ZEV Credit: Examples

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*0.1 credit allowed for HEVs that promote off-board charging
 **If fuel cycle emissions equivalent to electric vehicle

Major Regulations Show Similar Cost Effectiveness



Summary

- Reductions from LEV II are projected to meet SIP measure M2 requirements
- Proposal provides extra emission reductions which would be applied to the “Black Box”
- Proposal is cost effective
- Other potentially very clean technologies also appearing - hybrids, fuel cell vehicles, etc.