

**AIR RESOURCES BOARD**

2020 L STREET  
P.O. BOX 2815  
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**AGENDA ITEM 95-8-1**

**ADOPTION OF AMENDMENTS TO THE CERTIFICATION PROCEDURES FOR ALL  
ON-ROAD MOTOR VEHICLE RETROFITS AND ADOPTION OF OPTIONAL RETROFIT  
EMISSION STANDARDS FOR HEAVY-DUTY ENGINES AND VEHICLES**

Copies of the slide presentation which supported the Air Resources Board's oral staff presentation given by Renee Kemena, as reflected on page 14 of the transcript.

Attachments

# **Proposed Amendments to the Retrofit Certification Procedures and Proposed Credit Standards for Heavy-Duty Vehicles**

**July 27, 1995**

**California Environmental Protection Agency**



**Air Resources Board**

# **Purpose of Proposed Changes**

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**Streamline  
Certification  
(all vehicles)**

**Heavy-Duty  
Retrofit  
Credits**

# Outline

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- Background
- Changes to Streamline Certification (all)
- Credit-Related Changes (mostly HDV)
- Conclusion

# Background

# Recent Events Related to Retrofit Regulation

1989	ARB testing of in-use retrofits
1992	Board adopts 1994+ procedures
1993	Board adds retrofits to credit guidelines
1994	Phase-in of 1994+ procedures

# **1993 and Previous Model-Year Retrofit Certification Procedures**

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- **Problems with excess emissions**
- **No durability testing**
- **Improper installation**

# **1994+ Retrofit Certification Procedures**

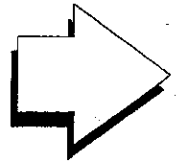
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- Durability testing
- Manufacturer and installer warranty
- Certification of each engine family
- In-use compliance testing



# 3 Retrofit Certification Procedures

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- 1994+ retrofit certification procedures
- 1993 and earlier procedures for LPG and natural gas retrofits
- 1993 and earlier procedures for alcohol/gasoline retrofits

# Number of Retrofits

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- Averaged 3,000 - 4,000 retrofits per year shortly before 1994 phase-in
- Number of retrofits per year dropped significantly in 1994 (to 1,500/yr)

# **Part I: Changes to Streamline Certification**

# Phase-in Schedule for 1994+ Procedures

Year	Phase-in %
1994	15
1995	55
1996	100

# **Manufacturer/Installer Concerns**

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- No kits certified in 1994 to meet required 15%
- Limited range of kits available
- Cost/time for certification
- BAR referee inspection

# **Staff Has Worked with Industry to:**

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- Resolve implementation issues
- Determine characteristics vital to demonstrating kit performance
- Streamline retrofit process

# **Administrative and Regulatory Changes**

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- **Administrative Changes**
  - technical clarification, streamlining
  - not part of this proposal
- **Proposed Regulatory Changes**
  - under consideration today

# Administrative Changes

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- More liberal carry-over/carry-across
  - kits available for more engines
- Qualified use of conventional fuel deterioration factors (DFs)
  - decrease cost of durability testing



# **Proposed Regulatory Changes to Streamline Certification**

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- Alternate durability test plan
- Alternate installation inspection
- Extend phase-In of 1994+ procedures

# **Proposed Alternate Test Plan**

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- **Submit proposed DFs**
- **Certify retrofit system**
- **Validate DFs after certification**

# **Enforcement Under Proposed Alternate Test Plan**

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- In-use testing, confirmatory testing to verify DFs
- Mfrs must recall retrofits and fix problems

# **Advantages of Alternate Test Plan**

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- Provides faster return on investment
- Should encourage more retrofits
- Air quality protection ensured through recall provisions

# **Impact of Alternate Test Plan on Air Quality**

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- Recall provisions would provide deterrent to emissions increase
- Potential benefits from lower emitting retrofits could outweigh risks

# Changes from Staff Report

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- Allow alternate durability test plan for all vehicle classes
- Two years to validate DFs
- Update reg to reflect OAL-approved provision on OBD

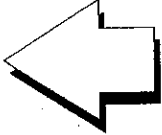
# **Proposed Alternate Installation Inspection**

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- 10 installations pass BAR
  - same kit, similar make and model
- Submit every tenth retrofit of same type
- Initial smog check at referee station

# Proposed Phase-in Schedule for 1994+ Retrofit Certification Procedures

Year	Proposed %
1994	15
1995	55
1996	55
1997	100





# **Minor Proposed Changes to Streamline Certification**

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- Provide facility locations (all)
- OEM exemption (all)
- Remove 8 mode chassis test (HDV)
- Carry-over/carry-across test reference (all)

# **Changes Reflected in 1993 and Earlier Retrofit Certification Procedures**

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- **Alternate installation inspection**
- **Extended phase-in of 1994+ procedures**

# **Part II: Changes Related to Credits**

# Existing Credit Standards

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- Light and medium-duty retrofits have LEV standards
- Board adopted optional standards for new heavy-duty vehicles in June, 1995

# **Need for Heavy-Duty Retrofit Credit Standards**

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- **Mobile source credit programs**
- **SIP measures**

# **Heavy-Duty Vehicle SIP Measures**

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- National 2.0 g/bhp-hr std. in 2004
- Engine mfrs, U.S. EPA, ARB sign SOP for comparable reductions July 11, 1995
- HDV retrofits could introduce low-emitting technology

# **Heavy-Duty Vehicle SIP Measures**

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- Reductions from existing fleet as alternative to CA-only NOx std. in 2002
- SMAQMD included reductions from HDV retrofits in SIP submittal

# **HDV Retrofit Credit Stds.**

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- **Pollutants: NO<sub>x</sub>, PM, HC, CO**
- **First credit std at least 25% below ceiling**
- **Additional, tiered standards to 0.0**
- **Increments vary by pollutant**



# Example NOx Credit Standards

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• Ceiling Standard: 6.0 grams/bhp-hr

• Credit Standards: 4.5

4.0

3.5

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1.0

0.5

0.0

Example:

1987

HDDE

# Proposed HDV Ceiling Standards

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- Formaldehyde for pre-1994
- PM for pre-1987
- CO and HC for diesels
- Apportion combined HC + NO<sub>x</sub>

# **Other Proposed Changes to 1994+ Retrofit Certification Procedures**

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- Use 1994+ procedures for credit (all)
- Conventional fuel retrofits OK (all)
- Tier 1 standards OK (LDV, MDV)
- Similar standards on dual fuels (LDV, MDV)

# Conclusion

# **Proposed Changes to Streamline Retrofit Certification**

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- Streamline certification process
  - decrease cost, time to complete
- Make wider range of kits available soon

# **Proposed Changes to Streamline Retrofit Certification**

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- Retain durability testing, warranties, in-use compliance
- Should protect air quality through in-use testing and recall

# Proposed Credit-Related Changes

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- Encourage low-emission retrofits
- Help with SIP measure reductions
- Allow credits from heavy-duty vehicle and other retrofits

# **Staff Recommends that the Board Adopt the Proposed:**

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- Amendments to retrofit certification procedures
- Heavy-duty retrofit credit standards
- Related reference changes