

# Public Workshop: Proposed Amendments to the Alternative Fuel Conversion Certification Procedures for New and In-Use Vehicles and Engines

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Air Resources Board Auditorium  
El Monte, California  
May 1, 2013

**California Environmental Protection Agency**

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**Air Resources Board**

# Agenda

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- Purpose
- Background
- Staff proposal
- Next steps

# Need for Proposed Amendments

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- Better align ARB's procedures with recent changes adopted by U.S. Environmental Protection Agency
- Streamline ARB's new and in-use alternative fuel vehicle/engine certification programs
- Update and simplify the application and approval process
- Reduce market barriers for small volume convertors
- Preserve emission benefits

# Background - New Vehicle Conversions

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- Requires new vehicle/engine certification
- Submit an application and update it for changes
- Meet the applicable emission standards and adhere to the appropriate test procedures
- Demonstrate durability
- Meet the applicable labeling requirements
- Provide emissions warranty to the ultimate purchaser
- Identify all makes and models
- Comply with on-board diagnostic (OBD) requirements

# Background - New Vehicle/Engine Certifications

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- 13 CCR § 1961 - Exhaust Emission Standards and Test Procedures - 2004 through 2019 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.
- 13 CCR § 1961.1 - Greenhouse Gas Exhaust Emission Standards and Test Procedures - 2009 through 2016 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.
- 13 CCR § 1961.2 - Exhaust Emission Standards and Test Procedures - 2015 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.
- 13 CCR § 1961.3 - Greenhouse Gas Exhaust Emission Standards and Test Procedures - 2017 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.
- 13 CCR § 1956.8 - Exhaust Emissions Standards and Test Procedures -1985 and Subsequent Model Heavy-Duty Engines and Vehicles.
- 13 CCR § 1976 - Standards and Test Procedures for Motor Vehicle Fuel Evaporative Emissions.
- 13 CCR § 1968.2 - Malfunction and Diagnostic System Requirements – 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines.
- 13 CCR § 1971 - Engine Manufacturer Diagnostic System Requirements – 2007 and Subsequent Model-Year Heavy-Duty Engines.
- 13 CCR § 1971.1 - On-Board Diagnostic System Requirements – 2010 and Subsequent Model-Year Heavy-Duty Engines.

# Background - In-Use Vehicle Conversions

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- Requires Aftermarket Parts certification
- Certify to same or more stringent emission standards
- Certification based on engine family
- Demonstrate durability
- Supplemental emission control information label
- Manufacturer's and installer's warranty
- Evaluate the impact on auxiliary emission control devices
- Comply with OBD requirements
- Installation inspection
- In-use enforcement testing

# In-Use Vehicle/Engine Conversion Regulations

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- 13 CCR § 2030
  - Liquefied Petroleum Gas or Natural Gas Retrofit Systems
  
- 13 CCR § 2031
  - Alcohol or Alcohol/Gasoline Fuels Retrofit Systems
  
- Associated Test Procedures:
  - California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Liquefied Petroleum Gas or Natural Gas Fuels
  
  - California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for Motor Vehicles Certified for 1994 and Subsequent Model Years and for All Model Year Motor Vehicle Retrofit Systems Certified for Emission Reduction Credit
  
  - California Exhaust Emission Standards and Test Procedures for Systems Designed to Convert Motor Vehicles Certified for 1993 and Earlier Model Years to Use Alcohol or Alcohol/Gasoline Fuels

# Discussion Overview

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- Single process to certify retrofit systems
- Streamlined application and review process
- Reduced testing requirements
- Demonstrate base vehicle emissions maintained
- Better alignment with U.S. EPA requirements
- Not applicable to full vehicle certification

# Summary of Added Flexibility

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- Applies to small-volume converters
- For previously CA certified vehicles only
- For conversions to the same tailpipe emission standard as the base vehicle
- Added flexibility for emissions testing
- Reduced OBD demonstration
- Changes sunset after 5 years

# Small Volume Convertors

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- Defined as retrofit system manufacturers with California annual sales of less than 4,500 alternative fuel retrofit systems in any given calendar year
  - Out-of-state sales don't apply
  - All engine families/fuel types

# Retrofit System Certification

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- For conversions to the same tailpipe emission standard as the base vehicle
- Certifies conversion kit and installation
- Provides path for converting relatively new vehicles at the point of sale
- Issue “non-expiring” Executive Order
- Applies to new and used vehicle conversions

# Certification Fuel

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- Natural Gas
  - Same as Federal Standards
- Liquid propane gas
  - Same as motor vehicle fuel per Title 13, California Code of Regulations, section 2292.6
- Fuel specifications handout available

# Allow Emissions Multiplier

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- For exhaust emissions testing, allow for option to use non-methane hydrocarbon (NMHC) X1.5 multiplier for both liquid propane gas & natural gas to determine non-methane organic gases (NMOG)
- Currently administratively allowed for natural gas conversions if requested

# Test Waivers for Dual-Fuel Systems

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- Applies to exhaust and evaporative emissions testing on the original fuel
- Manufacturers must submit an engineering justification for the waiver(s)
- Waivers will be allowed where no changes have been made that effect emissions while operating on the original fuel
- Requires approval by the Executive Officer

# Deterioration Factors (DF's)

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- Allow for use of U.S. EPA assigned DF's in lieu of high-mileage emissions tests
  - Accepted for test vehicles with mileage accumulation up to 25K miles
  - Test vehicles with >25K miles may prorate assigned DF's
- Manufacturer's may propose DF for Executive Officer approval if none available
- DF validation replaced with in-use testing

# Streamlined OBD Proposal

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- Available to small volume converters for conversions to same emission standard as base vehicle
- Reduced to 4 demonstrations (demos) if no changes
- Allows use of less expensive rapid aged parts or in-use vehicle
- Unchanged monitors only required to show functionality
- Requires compliance statement for all monitors
- Post-certification testing unchanged

# OBD Application

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- Focused only on retained demos & added/modified/deleted hardware and software
- Waive additional tests if underlying/base emission controls unchanged
  - Such as: EGR, VVT, misfire, cold start, secondary air, A/F cylinder imbalance rich & lean, downstream O2 sensor(s)

# OBD Retained Demos

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- Fuel system rich & lean, oxygen (O2) sensor, catalyst monitor demonstration
  - Only require “worst-case” pattern for O2 sensor demo
  - Add options in lieu of original equipment manufacturer full useful life aged demo parts
    - Rapid aged catalyst(s) & O2 sensor(s) per Aftermarket Parts aging cycle, or
    - Complete/converted in-use vehicle >25K miles
  - Catalyst monitor demo still requires threshold catalyst(s)
    - Margins increased additional 25% to eliminate under/over shooting

# OBD Waived Demos

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- Unchanged monitors
  - Implant gross fault(s) & show monitor detects, no emissions test
- Requires applicants to provide compliance statement for all monitors
- No change to post-certification compliance testing

# In-Use Compliance Testing

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- In-use emissions testing is required upon request by ARB's Executive Officer
- Emissions testing of a minimum of 3 vehicles per engine family
- For each failure, 2 more vehicles must be tested up to a maximum of 10
- Requires converters to track/report sales

# Smog Check

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- Registration of vehicle conversions previously registered on different fuel
- Allow fleets to assume responsibility for required Bureau of Automotive Repair (BAR) inspection
- Currently seeking BAR input

# Alternative Test Methods

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- Investigating option to use PEMS for heavy-duty alternative fuel conversions
- PEMS used in lieu of engine dynamometer testing
- Cost-effective alternative for generating data on emissions compliance
- Convertors agree to sign up for PEMS in-use compliance testing

# Conversion to a More Stringent Emissions Standard

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- Currently required to adhere to the new vehicle/engine certification requirements
  - Fuel change not enough to reduce emissions to meet the more stringent standard – requires re-engineering
  - Changes impact other emission control components, such as catalytic converters, OBD systems
  - Changes fall outside the design scope of the original base vehicle
  - Full certification needed to ensure expected emissions reductions achieved throughout the converted vehicles actual life

# Issues for Conversion to a More Stringent Emission Standard

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- Not needed to sell conversions in California
  - Primarily for carpool lane access, incentive funding
- Staff's proposal already reduces market barriers for conversions
  - Adequate to show base emissions maintained
  - Not adequate to address changes to a lower standard
- Full testing needed to assure lower emissions throughout vehicles useful life
- Changes could undermine purpose of economic incentives

# Next Steps

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- Please provide comments to ARB by mid May
- Send comments to Craig Duehring at [cduehrin@arb.ca.gov](mailto:cduehrin@arb.ca.gov)
- Initial Statement of Reasons available August 7, 2013
- September 2013 Board hearing

# Contact Information

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# For More Information...

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Please visit the Alternative Fuel Conversion Certification Procedures informal regulatory page at:  
<http://www.arb.ca.gov/msprog/onroad/altfuelconv/altfuelconv.htm>

Stay informed by joining the Alternative Fuel Conversion Certification Procedures list serve at:  
[http://www.arb.ca.gov/listserv/listserv\\_ind.php?listname=altfuelconv](http://www.arb.ca.gov/listserv/listserv_ind.php?listname=altfuelconv)

# Certification Contact Information

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