

Public Workshop: OBD Requirements for Alternative Fuel Retrofit System Certification for 2004 and Subsequent Model Year In-Use Vehicles and Engines



Air Resources Board Auditorium
El Monte, California
November 12, 2013

OBD Compliance for Retrofit Conversions

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- New light duty and medium duty alternative fuel vehicles required to meet full OBDII requirements
- New heavy duty alternative fuel vehicles and heavy duty retrofit conversions required to meet Engine Manufacturer Diagnostic (EMD+) system requirements for 2013- 2017 model years (MY)
 - 2018+MY must meet full heavy duty OBD requirements
- Retrofit conversions have streamlined OBD certification requirements
 - Meet OBD requirements for new alternative fuel conversions except for following allowances:
 - Reduction in certification documentation for all retrofit conversion manufacturers
 - Demonstration testing flexibilities for small volume (< 4,500 vehicles) retrofit conversion manufacturers

OBD Changes for All Retrofit Conversions

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- Application requirements same as for new vehicle conversions except the following:
 - Manufacturers can propose a plan for limited documentation including only modifications, additions, and/or deletions to OBD system
 - E.g., OBD monitor documentation with strikeout/underline used to indicate changes.
 - Misfire probability of detection charts/tables not required if misfire monitor calibration unchanged

OBD Changes for Small Volume Retrofit Conversions

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- Certified to same emission standard
 - ▣ Allow alternate aging requirements for demonstration vehicle through 2017MY
 - Lower mileage in-use vehicle (~25,000 miles) or rapidly aged vehicle (~50,000 miles)
 - ▣ Require demonstration of three monitors (exhaust gas sensor, fuel system, and catalyst) through 2017MY
 - For exhaust gas sensor demonstration, manufacturers can propose a plan to conduct a single test using the worst case slow response pattern
 - Waive demonstration of remaining monitors if monitors and emission controls unchanged
 - ▣ 2018+MY – same requirement as certified to more stringent emission standard

OBD Changes for Small Volume Retrofit Conversions (cont.)

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- Certified to more stringent emission standard
 - ▣ Allow demonstration of three monitors (catalyst, exhaust gas sensor, fuel system) to obtain conditional approval
 - Demonstration of remaining monitors required after conditional approval granted
 - Proposed 15-day change: demonstration required within 90 calendar days after conditional approval granted

OBD Demonstration Requirement Highlights

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- Demonstration Testing for All Conversions
 - Threshold catalyst must represent real world deterioration (e.g., thermal aging)
 - Holes and bypasses are unacceptable
 - On dual bank systems, both banks must have simultaneously deteriorated components (e.g., exhaust gas sensor, fuel system, and catalyst) to the same level
 - OBD data collected during testing called out in OBD regulations (e.g., section 1968.2(i)(2.4))
 - Include emission data, time of MIL illumination, freeze frame information and test results stored

OBD Approval Process for Retrofit Vehicles

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Letter of Intent/Pre-certification Meeting



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graph TD; A[Letter of Intent/Pre-certification Meeting] --> B[OBD Application]; B --> C[Review/Q&A]; C --> D[OBD Approval Letter]; D --> E[Post-Certification Activities];
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The diagram illustrates a five-step process for OBD approval. Each step is contained within a blue rounded rectangular box, and the steps are connected by dark blue downward-pointing arrows. The boxes are arranged in a descending staircase pattern from top-left to bottom-right.

OBD Application

Review/Q&A

OBD Approval Letter

Post-Certification Activities

OBD Approval Process for Retrofit Vehicles (cont.)

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- Pre-certification application documents including:
 - Letter of Intent
 - Includes intended product line-up for certification
 - Includes certification priority list for each model year
 - Documentation for parties authorized to submit certification information (e.g., conversion system manufacturer, calibration provider) and agreements between the responsible parties (e.g., confidentiality)
 - Authorization to use electronic signatures (MAC 2007-01)
 - Proposed certification documentation plan
 - Preliminary description of conversion system integration into OBD to ensure OBD compliance
- After providing these pre-certification documents with OBD staff, request OBD DMS account for application submittal

OBD Approval Process for Retrofit Vehicles (cont.)

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- OBD Application Documentation
 - Cover letter
 - Conversion system description
 - Operating strategy, added hardware with inputs/outputs, deletions or modifications to original system
 - OBD description
 - Additions, deletions, modifications
 - Enable conditions: new versus old
 - Malfunction Criteria: new versus old
 - Monitor control calibrations: new versus old
 - Standardization changes: CAL ID, CVN, readiness, data stream, monitoring test results, etc.
 - Production vehicle evaluation (PVE) test proposal
 - OBD demonstration data

OBD Approval Process for Retrofit Vehicles (cont.)

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- Post OBD-Application Submission
 - After complete application received:
 - Application reviewed by staff
 - Staff contacts applicant with questions
 - Timely response needed to expedite approval
 - OBD approval letter issued

Post-Certification OBD Requirements

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- Production Vehicle Evaluation
 - Verification of standardized requirements (1968.2 (j)(1))
 - Due 2 months after start of production
 - Verification of monitoring requirements (1968.2 (j)(2))
 - Due 6 months after start of production
 - Verification of in-use monitoring performance (1968.2 (j)(3))
 - Due 12 months after start of production
- Quarterly reporting of CAL ID/CVN if new calibrations
 - Needs to be updated to reflect any running changes and field fixes by the original equipment manufacturer

ELECTRONIC DOCUMENT MANAGEMENT SYSTEM (DMS) FOR THE ARB_OBD DOMAIN

Alternative Fueled Vehicle OBD Certification

DMS Requirements

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- Submittal of OBD applications required for full OBD compliant systems
- DMS not required for systems certified to EMD+ (heavy duty alternative fuel > 14,000 pounds GVWR through 2017MY)
 - Currently EMD+ applications submitted via email to assigned certification reviewer
- 2018+MY heavy duty conversions must meet full OBD requirements and use DMS for submission

DMS Accounts OBD Domain

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- DMS accounts will be created after the manufacturer submits the following
 - Letter of Intent
 - Business Agreement/Authorization Letter
 - Approved Certification Documentation Plan
 - Preliminary description of conversion system integration into OBD to ensure OBD compliance
 - DMS Contact List with access to OBD Domain

DMS for New Alternative Fuel Conversions

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- Documentation requirements and DMS submission not changed for new alternative fuel conversions

Required Application Bookmarks for Alternative Fuel Retrofit Manufacturers

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- ▣ A. Cover Letter
- ▣ B. Control System Description
 - At a minimum: hardware/software added, deleted, or modified
- ▣ C. OBD Documentation Plan
 - Includes PVE plan
- ▣ D. Demonstration Data Plan
- ▣ E. Demonstration Data Report
- ▣ F. List of OBD diagnostics
 - At a minimum: diagnostics added, deleted, or modified

Naming Conventions for Retrofit Alternative Fuel Manufacturers

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- File Naming Convention
 - ▣ Single Test Group CBI_Test Group Name_A-F.pdf
 - Example: CBI_DCEXH03.2U2A_A-F.pdf
 - ▣ OBD Group CBI_Manufacturer Code_OBD Group Name_A-F.pdf
 - Example: CBI_DCEX_OBD GROUP 1_A-F.pdf

Where to upload OBD documents?

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- OBD Certification Documents go into OBD Domain (ARB_OBD)
- Sign in -> <https://ssl.arb.ca.gov/edms/servlet/edms.do>

OpenEDMS 3.8

Change Language: English

Enterprise Document and Workflow Management Solution

OpenEDMS System Highlights:

- Entirely Web Based
- No Training Required
- Simple Implementation
- Enterprise Security

OpenEDMS - User Login

User Name :

Password :

Domain : ARB_OBD

Sign In Reset

[Forgot Password](#)

ARB Document Management System
Friday, November 1, 2013

To get a new password

© 2007 Pitney Bowes Group 1 Software - Transforming Documents into Knowledge

Where to upload OBD Documents?

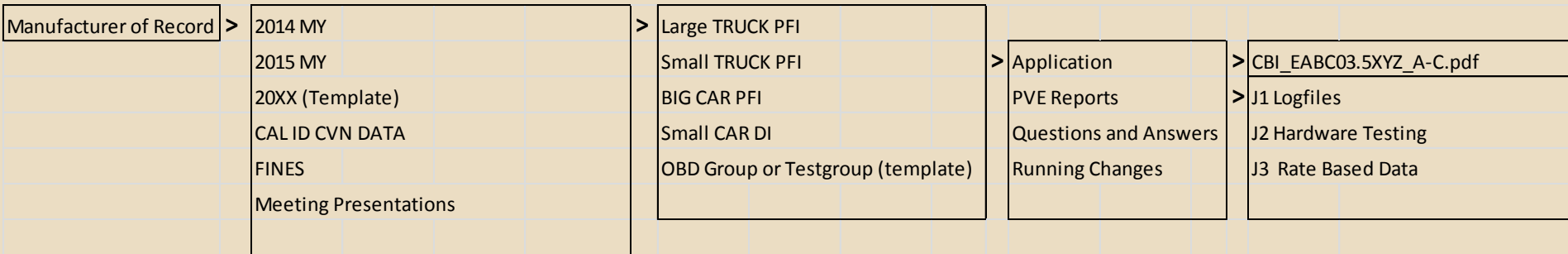
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- Alternative Fuel Conversion Manufacturers will have two methods of reporting
 - ▣ Manufacturer of Record – Single directory
 - ▣ Manufacturer of Record + OBD Calibration Provider – Two Independent Directories

Single Directory

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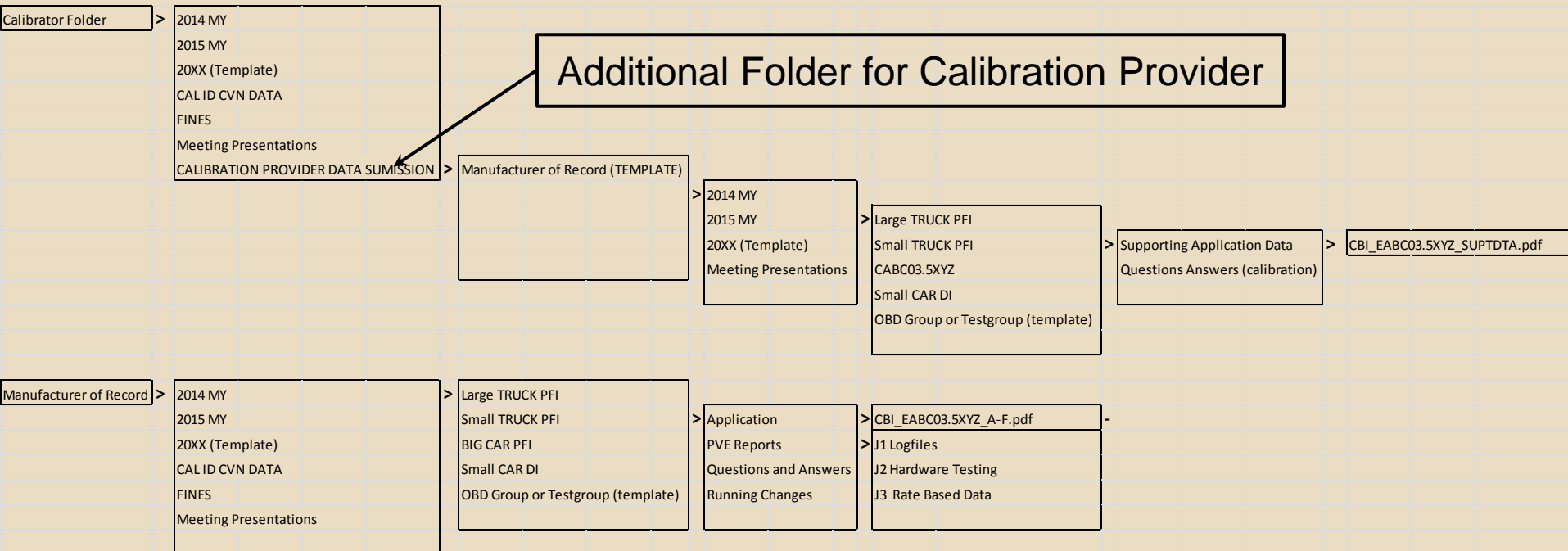
□ Straight Forward Example



Two Independent Directories

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□ Independent Directory Example



- In cover letter, manufacturer of record must provide calibration provider link indicating location of supporting data

Workflow Requirements

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- Upload documents into corresponding application folders
- Submit documents to a single workflow
 - ▣ Workflow Naming Convention (Process Name) => Request for OBD II approval_(Test Group \ OBD group name)
 - ▣ Tracking mechanism triggered
 - ▣ Certification reviewer notified
 - ▣ Process added to queue
- Workflow required for running change
 - ▣ Running Change Submission_(Test Group \ OBD group name)
- Workflow required for field fix
 - ▣ Field Fix Submission_(Test Group \ OBD group name)
- Workflow required for quarterly deficiency fine payment
 - ▣ Calendar Year 2013 Quarter #_Manufacturer Name

Post-Certification Requirement DMS

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- For the following required items, upload documents into corresponding directories in DMS and email a notice to OBD staff instead of creating workflow
 - ▣ CAL ID and CVN data
 - ▣ Standardized communication logfiles per 1968.2 (j)(1)
 - ▣ Verification of monitoring requirements report and logfiles per 1968.2 (j)(2)
 - ▣ In-use Monitoring Performance Ratio data per 1968.2 (j)(3)

ARB Contacts

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OBD Homepage:
<http://www.arb.ca.gov/msprog/obdprog/obdprog.htm>