Off-Road Spark Ignited Engine/Equipment Certification

2021 Truck and Engine Manufacturers Association Compliance Workshop
April 27-28, 2021
MY 2022 Regulations and Test Procedures
Exhaust and Evaporative

- No changes from MY 2021 for these categories
  - Small Spark-Ignited Engines (SSIE)
  - Large Spark-Ignited Engines (LSIE)
- Mfrs need to submit Excel Model Summary Sheet with their MY 2022+ Certification Applications
MY 2022+ Certification Applications
Excel Model Summary Sheet

• Applicable to all categories, including SSIE and LSIE
• Mfrs need to submit Model Summary Sheet using the appropriate Excel template for each cert application in addition to the normal cert application
• Facilitates posting Executive Orders (EOs) on CARB website
• Required for MY 2022+, but optional for MY 2021
• Templates are posted on each category’s certification webpage
Traditional Certification Process

Manufacturer Submits application

Application includes all CARB checklist items?

Yes

CARB sends “accepted for filing” notification e-mail to Manufacturer

No

CARB reviews in detail if application meets all requirements?

Yes

CARB issues EO

No

Manufacturer responds in 60 days?

Yes

CARB sends close-out letter to Manufacturer

No

CARB asks for more information

Manufacturer responds in 60 days?

Yes

No

CARB sends “not-accepted for filing” notification to request more information
## SSIE Exhaust Certification Checklist

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<tr>
<th>INCLUDED (Y/N)</th>
<th>Checklist</th>
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<td>ABT Plan*</td>
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<td>Emissions Durability/Compliance Plan*</td>
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<td>Auxiliary Cooling Questionnaire</td>
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<td>Auxiliary Emission Control Devices (AECD) Description/Statement of Compliance**</td>
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FYWC - First Year or When Changed (DMS signature letter, etc.)

* - If Applicable

**Added after the Mail-Out ECARS #15-07
SSIE & LSI <1L Evap Certification Checklist

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**Added after the Mail-Out ECARS #15-07
Certification Preview Program

- Certification Preview Program/Pre-Certification Meetings with Mfrs
  - Mfr presents product offerings
    - Design and emission control system changes to existing engines/equipment
    - New engines/equipment
  - Test and certification plans
  - Carry-over/carry-across proposals
  - New standards/requirements
- Mfr should request approval for certification methods/procedures
  - Auxiliary Emission Control Devices (AECD)
  - Emissions durability/compliance plan
Tamper Resistance Method (TRM) Approval

• Adjustable parameters must be made tamper resistant to prevent changes to engine manufacturer-certified calibrations
• CARB may review any previously issued TRM approval at any time to ensure materials and methods are effective
• Mfrs shall submit their TRM samples for re-evaluation upon request or before the TRM approval expires (5 years from approval date)
• Goal is to approve ahead of cert application submissions to avoid delays
ECU Calibrations/Programs/AECDs

• Mfrs must disclose all calibrations/programs/AECDs in ECU
  • Multiple calibrations
    (e.g. Fuel Economy mode/Power mode/Normal mode)
  • Mfrs may indicate if any not in use and list conditions that will activate it
Large Spark-Ignition Engine >1L Certification

- If advertised useful life or basic mechanical warranty is longer than the minimum useful life (i.e., 5000 hours), engine family must be certified to the longer useful life (40 CFR 1048.101(g))
- Must disclose all alternative modes of operation (i.e., performance mode, eco mode, etc.)
  - Must perform zero-hour emission test on each mode
  - Use worst-case mode configuration for durability testing
Top Certification Issues
General

• Provide emission warranty statement that meets the regulatory requirements. Manufacturers must submit:
  • Manufacturers’ warranty statement
  • CARB’s warranty statement (verbatim as required in regulations)
  • A valid warranty service #
• Manufacturers should self evaluate Tamper Resistance Methods before submitting samples
Top SSIE Evap Certification Issues

- Submit bond worksheet and copy of bond with application (if applicable)
- Use updated naming convention for evap family name
- Provide a detailed description and schematics of the evaporative emission control system
  - Running loss control description and approval #
  - Include a schematic layout of how the evap system components are configured
Top SSIE Performance-based Evap Certification Issues

- Measure and report hot soak emissions
- Carbon canister must meet minimum working capacity specified in TP-902
  - At least 1.4 g/L of fuel tank nominal capacity for tanks ≥ 3.78L
  - At least 1.0 g/L of fuel tank nominal capacity for tanks < 3.78L
- Report carbon canister working capacity in grams/Liter
- No more carry across allowed for evaporative emissions test data
Top SSIE Design-based Evap Certification Issues

• Listing uncertified evap components in the cert application
  • Verify component EOs in the web link below before submitting:

• Carbon canister undersized for fuel tank volume
  • Check fuel tank limits specified on canister component EO
  • e.g. Maximum nominal fuel tank volume specified in carbon canister EO is 4L, but mfr using a fuel tank with nominal volume of 5L
Top SSIE Design-based Evap Certification Issues (cont’d)

• Fuel tank specifications on fuel tank component EOs should be consistent with information provided in certification application
• Nominal and total fuel tank volumes listed on the cert application should match those listed on the fuel tank component EO
SORE Evap Component Certification

- Application forms and guidance on CARB website
    - Carbon canisters
    - Fuel lines
    - Fuel tanks
  - Will be updated periodically with stakeholder input
Evap Component Certification – Frequent Issues

- Incomplete application forms
- Missing additional attachments
  - Test data
  - Pictures of sealed test tanks
  - UV radiation intensity
  - Temperature records
- Inconsistent information
  - Nominal capacity
  - Tank penetrations
  - Internal surface area (e.g., including cap area)
Evap Component Certification – Other Issues

- Permeation rate calculations not following TP-901
- Butane load rate
- Inconsistent part numbers
- Capping/plugging openings
Potential Amendments to the SORE Regulations

• Board Hearing: anticipated Fall 2021
• Last public workshop March 24, 2021
• More information can be found at the link below:
  https://ww2.arb.ca.gov/sore-meetings-workshops
SSIE & LSIE Certification Page Links

• Small Spark-Ignition Engines
  https://ww2.arb.ca.gov/small-road-engine-or-equipment-regulatory-and-certification-documents

• Large Spark-Ignition Engines
  https://ww2.arb.ca.gov/large-spark-ignition-engine-regulatory-and-certification-documents