

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

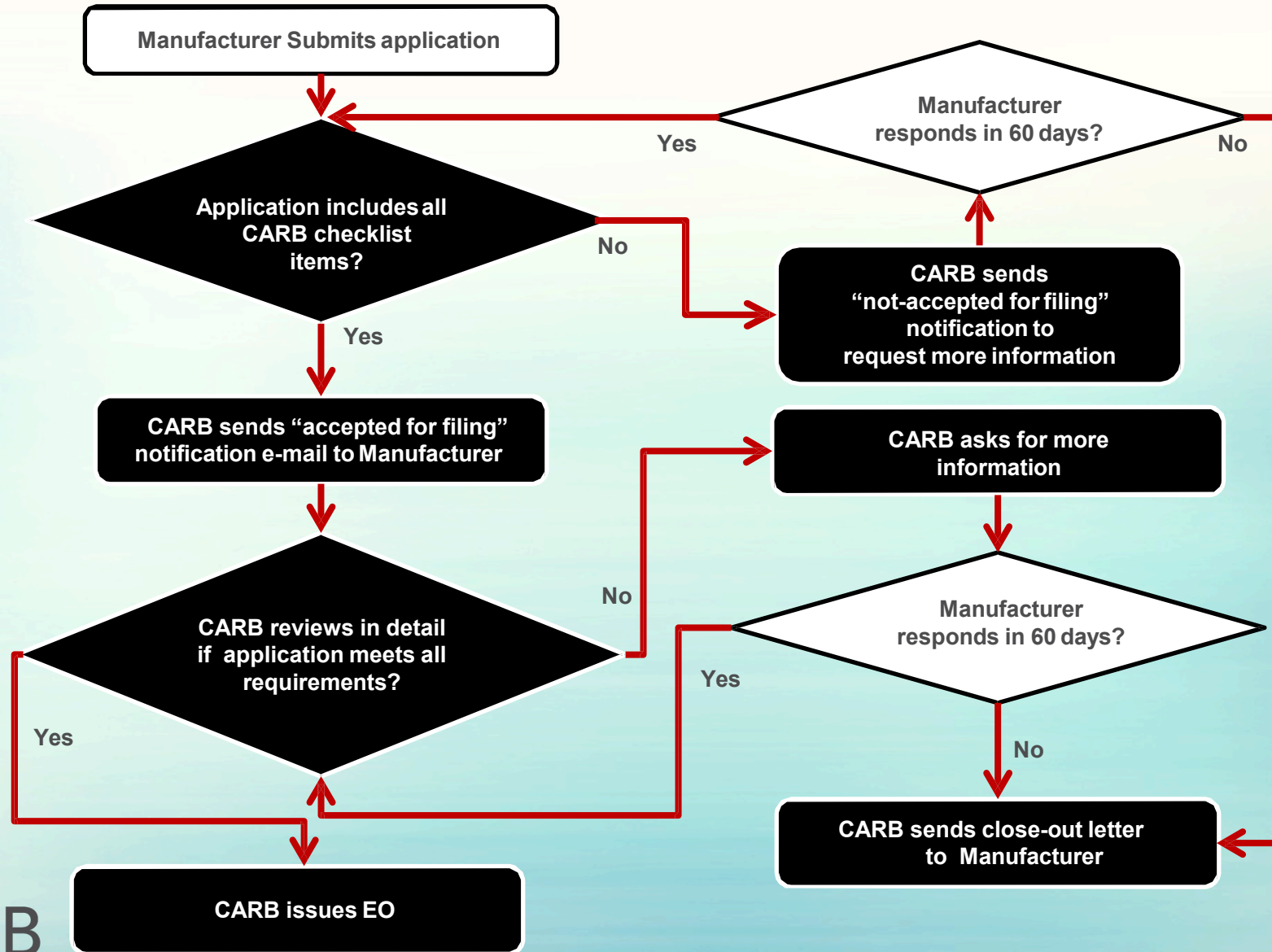
- No changes from MY 2021 for these categories
 - Small Spark-Ignited Engines (SSIE)
 - Large Spark-Ignited Engines (LSIE)
- Mfrs need to submit Excel Model Summary Sheet with their MY 2022+ Certification Applications

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



SSIE Exhaust Certification Checklist

SSIE Exhaust	
INCLUDED (Y/N)	Checklist
	Certification Application
	Statement of Compliance
	Label Format
	Warranty Language Format
	Confirmatory Test*
	New mfr documents (FYWC)
	Tamper Resistance Method*
	ABT Plan*
	Emissions Durability/Compliance Plan*
	Auxiliary Cooling Questionnaire
	Auxiliary Emission Control Devices (AECD) Description/Statement of Compliance**
FYWC - First Year or When Changed (DMS signature letter, etc.)	
* - If Applicable	

Mail-Out ECARS #15-07

SSIE & LSI <1L Evap Certification Checklist

SSIE & LSI <1L Evap	
INCLUDED (Y/N)	Checklist
	Certification Application
	Statement of Compliance
	Label Format
	Warranty Language Format
	Confirmatory Test*
	New mfr documents (FYWC)
	Parts list for certified components
	ABT plan (performance based)*
	Bond Worksheet/Copy of Bond**
	Auxiliary Emission Control Devices (AECD) Description/Statement of Compliance**
FYWC - First Year or When Changed (DMS signature letter, etc.)	
* - If Applicable	

Mail-Out # ECARS 15-07

**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 $\geq 3.78\text{L}$
 - At least 1.0 g/L of fuel tank nominal capacity for tanks $< 3.78\text{L}$
- 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:
<https://ww2.arb.ca.gov/our-work/programs/small-road-engines-sore/sore-evaporative-component-executive-orders>
- 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
 - <https://ww2.arb.ca.gov/our-work/programs/small-road-engines-sore/sore-evaporative-component-executive-orders>
 - 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>