

Off-Road Small and Large Spark-Ignition Engines

2011 EMA Certification Workshop

May 5, 2011

California Environmental Protection Agency

 **Air Resources Board**

Small Spark-Ignition Engines (SORE)

California Environmental Protection Agency

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SORE Adjustable Parameters

- An adjustable parameter is any device, system, or element of design which is physically capable of being adjusted, and which, if adjusted, may affect emissions or engine performance
- Example: carburetor air/fuel mixture screws (idle & WOT)
- Listed in the certification application
 - Description of parameter
 - Range of adjustment or tamper resistance method
 - Pictures/schematic

SORE Adjustable Parameters

With Range of Adjustment

- Example: carburetor air/fuel mixture screw (rich to lean setting)
- Engine must meet emission standards at any setting
- Staff may request manufacturer to test at any point in the range of adjustment (rich/lean)

SORE Adjustable Parameters

Equipped with Tamper Resistance Method

- Tamper resistant, not tamper proof (Common sense approach)
- *40 CFR 90.112b*: Not considered adjustable if
 - permanently sealed by manufacturer
 - not normally accessible using ordinary tools
- Manufacturers are encouraged to try themselves to tamper before sending parts to staff
- Examples of tamper resistance methods:
 - Limiter Caps
 - Breakoff Screws
 - Metal Plugs
 - Adjustable using special tools
 - Inaccessible due to parameter recessed in engine housing

SORE Adjustable Parameters

Tamper Resistance Evaluation Protocol

- Staff tests tamper resistance as a part of certification
 - Simple tools, e.g. pliers, screwdrivers, hammer
 - Testing done in less than 30 minutes
 - No damage to carburetor or engine
 - At least two staff participate
- Staff may revisit past approvals
 - Technology changes
 - Regulatory changes
 - Audit/enforcement findings
 - Production variations
 - Additional lead time provided for existing approvals

SORE Adjustable Parameters

Special Tools

- Availability to consumers
 - Internet
 - Manufacturer specific tool clones
 - Technical progression
- Need to revisit prior approvals?
- Manufacturers have indicated consumers tampering and affecting warranty claims
- Some designs defeated with ordinary tools
- Future industry workshop to solicit input

Large Spark-Ignition Engines (LSI)

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LSI \leq 1.0 Liter Evaporative Requirements 2011+ MY

- Engines are subject to SORE Evaporative requirements
- LSI regulations incorporate by reference the SORE Regulation and Test procedures
- Evaporative certification procedures and guidelines are the same as those for SORE (except Small Production Volume Tank Exemption)

LSI \leq 1.0 Liter Evaporative Requirements 2011+ MY

- 11 evaporative families certified to date
- Engine manufacturers should inform equipment manufacturers of new evaporative requirements
- Evaporative certification application and related documents may be found in the "Guidelines" section of the LSI Resource Webpage

<http://www.arb.ca.gov/msprog/offroad/lsi/lsictp/lsictp.htm>

Off-road Spark-ignited Engine Certification Section

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