

# Off-Road Small and Large Spark-Ignition Engines

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2010 EMA Certification Workshop

May 4, 2010

California Environmental Protection Agency

 **Air Resources Board**

# Small Spark-Ignition Engines (SORE)

California Environmental Protection Agency

 **Air Resources Board**

# SORE Exhaust

## 2010 Model Year (MY) and Later

- Exhaust Emission Standards remain unchanged from 2008 MY
- Starting 2010 MY, manufacturers should submit a copy of the EPA bonding worksheet through DMS
- Confirmatory Emission Test is required if HC+NO<sub>x</sub> certification test emission level is within 15% of the emission standard

# SORE 2010+ MY Evaporative Requirements (Small Production Volume Tank Exemption)

- Prior to 2010 MY, Small Production Volume Tank Exemption Manufacturers (SPVTM) were exempt from all evaporative requirements with the exception of labeling
- SPVTM must meet:
  - Low Permeation Fuel Hose (CCR Title 13 Section §2754)
  - Carbon Canister (§2754)
  - Fuel Cap Performance Standard (§2756)
- Fuel tank is exempt - permeation data not required to be submitted

# Large Spark-Ignition Engines (LSI)

California Environmental Protection Agency

 **Air Resources Board**

# LSI $\leq$ 1.0 Liter

## 2011+ MY Requirements

- New displacement categories for 2011+ MY  $\leq$  1.0 liter
- Exhaust Emission Standards

Model Year	Displacement	HC+NO <sub>x</sub> (g/kW-hr)	CO (g/kW-hr)
2002 - 2010	$\leq$ 1.0 Liter	12.0	549
2011 and later	$\leq$ 825 cc	8.0	549
2011 - 2014	> 825 cc - $\leq$ 1.0 Liter	6.5	375
2015 and later	> 825 cc - $\leq$ 1.0 Liter	0.8	20.6

# 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

- 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>

- For questions, contact Byron Ng at (626)459-4312 or [bng@arb.ca.gov](mailto:bng@arb.ca.gov)

# Shift from LSI to Off-Highway Recreational Vehicle (OHRV)

- Starting 2011 MY, Rear Payload Capacity (RPC) for Off-Road Sport Vehicles (SV) and Off-Road Utility Vehicles (UV) are no longer applicable
- SV with  $RPC > 600$  lbs and UV with  $RPC < 350$  lbs are now classified as OHRV
  - Such vehicles are subject to the test procedures and certification protocols for OHRV
  - However, these engines must meet the new LSI exhaust emission standards instead of the OHRV emission standards

# Off-Highway Recreational Vehicle (OHRV)

- Starting 2011 MY, SV and UV are defined as OHRV

Vehicle Type	Pre-2011 MY	2011+ MY
SV with RPC > 600 lbs.	LSI ≤ 1.0 Liter	OHRV
SV with RPC ≤ 600 lbs.	OHRV	OHRV
UV with RPC < 350 lbs.	LSI ≤ 1.0 Liter	OHRV
UV with RPC ≥ 350 lbs.	OHRV	OHRV

## LSI > 1.0 Liter 2010+ MY Requirements

- Exhaust Emission Standards for 2010+ MY > 1.0 liter
  - HC+NOx: 0.8 g/kW-hr
  - CO: 20.6 g/kW-hr
- Alternate formula listed in §2433(b)(1)(B) no longer applicable to 2010+ MY

# Off-road Spark-ignited Engine Certification Section

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