

OFCI / SSIE / LSIE

2006 EMA Certification Workshop
April 18, 2006

California Environmental Protection Agency

 **Air Resources Board**



Off-Road Compression Ignition (OFCI) Engines

California Environmental Protection Agency

 **Air Resources Board**



Flexibility Engine Executive Order Request

- Needed for all Flex Engines (except <37 kw) beginning 1/1/2007
- Flex Engines must be the same as previously certified engines
- No test data is needed
- Letter requesting certification is required



Flexibility Engine Certification Request Letter

- Engine/Equipment manufacturers' corporate names
- Original Engine family name
- Original ARB Executive Order (EO) number
- Production Model year
- Equipment models
- Projected sales: U.S. and CA
- Copy of Labels
- Contact information--name, e-mail address and phone number





Flexibility Engine Label

Starting January 1st, 2007, the following statement of compliance applies:

“THIS ENGINE COMPLIES WITH CALIFORNIA EMISSION REQUIREMENTS UNDER 13 CCR 2423(d). SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN FOR THE EQUIPMENT FLEXIBILITY PROVISIONS CITED MAY BE A VIOLATION OF STATE LAW SUBJECT TO CIVIL PENALTY.” [Insert Engine Family Name]



Flexibility Engine Label

For flexibility engines < 37 kW and not subject to emission requirements under the Tier 2/3 program, the following statement of compliance applies:

“THIS ENGINE QUALIFIES FOR USE IN EQUIPMENT RATED BELOW 37 KW BY PROVISION OF 13 CCR 2423(d). SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN FOR THE EQUIPMENT FLEXIBILITY PROVISIONS CITED MAY BE A VIOLATION OF CALIFORNIA LAW SUBJECT TO CIVIL PENALTY.”



Tier 4 Flexibility Engine Equipment Label

- EMISSION CONTROL INFORMATION
- Equipment manufacturer's corporate name
- Production year of the Equipment
- Contact information--name, e-mail address, phone number
- The statement:
"THIS EQUIPMENT [or identify the type of equipment] HAS AN ENGINE THAT MEETS CALIFORNIA EMISSION STANDARDS UNDER 13 CCR 2423(d)."



Rebuild Engine Label Requirements

Starting January 1st, 2007, for the rebuilder:

- Keep original label if engine is rebuilt to the original emission configuration
- Replace label with a more accurate one if rebuilt to a more stringent configuration
- If original label is damaged, the label may be replaced by rebuilder
 - The rebuilder shall retain documentation for eight years
 - Provide documentation upon request of Executive Officer
- Incomplete engines need to be labeled



Confirmatory Test Requirement

ARB will require manufacturers to conduct confirmatory testing for Tier 2/3 engines if:

- The NMHC+NO_x certification level is within 0.2 g/kW-hr of the standard
- The CO certification level is within 0.5 g/kW-hr
- The PM certification level is within 0.05 g/kW-hr





Small Spark-Ignition Engines (SSIE)

California Environmental Protection Agency

 **Air Resources Board**

SSIE EXECUTIVE ORDERS

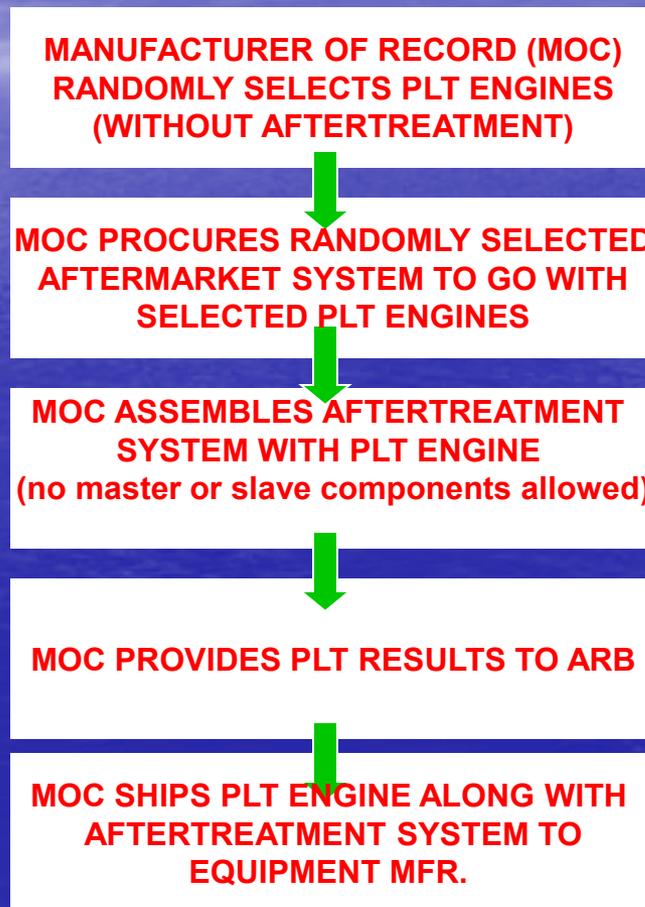
TYPE/CATEGORY	EXH. EO	EVAP. EO	Combined EO
< 80 cc			X
>80 cc, Integrated mfr.	X	X	
> 80 cc, Non- integrated Evap. Mfr.		X	
> 80 cc, Non- integrated Engine Mfr.	X		



If the Equipment MFR. Assembles the Aftertreatment for the Engine MFR



Production-Line Testing Protocol



Engine and Equipment Model-Year Matching

ARB POLICY

1. ARB will certify equipment of a given model-year with an engine from the *same* model-year



Engine and Equipment Model-Year Matching (con't)

2. ARB will certify equipment with engines up to one model-year *immediately* preceding the model year of the equipment



Engine and Equipment Model-Year Matching (con't)

3. ARB will certify equipment with previous model-year engines, without a time frame limitation, **as long as the emission requirements the engine meets are valid for the model-year of the equipment.**



EPA Small SI Compliance Program

- No changes anticipated in certification program
- Received tips of noncompliance
- CISD is reviewing compliance of Small SI Industry
 - Coordination with ARB and OECA



Nonroad Engine Certification Contacts

- Small SI
 - Mike Wolfe, wolfe.michael@epa.gov
 - Joe Hresko, hresko.joe@epa.gov
- Marine SI
 - Nydia Reyes-Morales, reyes-morales.nydia@epa.gov





Large Spark-Ignition Engines (LSIE)

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2007 and Later LSIE Test Procedures & Regulations

- Proposal
 - Harmonizes with U.S EPA 2.0 gram standard for 2007-2009
 - Provides for more stringent 0.6 gram standard for 2010 and beyond
- Board Hearing May 25-26, 2006

Please check the LSI Program page for updates

<http://arb.ca.gov/msprog/offroad/orspark/orspark.htm>



LSIE <1 liter Issues

- Currently the HC+NO_x standard is **12.0g/kW-hr for 2002 and later.**
- No changes to the standards for the 2007-2009 Model Years
- Continue to use current LSIE regulations and procedures



2007 LSI Durability Plans

- ARB is currently accepting (and welcomes) 2007 durability plans
- A *complete* application is required before review
- Staff generally reviews durability plans within 30 days
- If there are questions or problems, the manufacturer will be notified



EPA MY2007 LSI Requirements

- Transient and Steady State Testing
- Field Testing
- Evaporative Emissions (by design or testing)
- Diagnostic Systems
- Torque Broadcasting
- AECD Reporting
- EPA Selected In Use Testing
- Deterioration Factors
 - Durability plans approved by ARB will be accepted by EPA



EPA Certification Contacts

- LSI and Snowmobile
 - Michael Wolfe, wolfe.michael@epa.gov



Question and Answer



California Environmental Protection Agency

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Tier 4 Flexibility Engine Certification

- Applies to equipment for the 2008 and later model year test procedure
- The flexibility must be used within seven years

<u>< 19 kW</u>	<u>2008 - 2014</u>	<u>Tier 2</u>
<u>19 ≤ kW < 56</u>	<u>2008 – 2014¹</u>	<u>Tier 3²</u>
	<u>2012 - 2018</u>	<u>2008 Interim Tier 4</u>
<u>56 ≤ kW < 130</u>	<u>2012 - 2018</u>	<u>Tier 3</u>
	<u>2014 - 2020</u>	<u>2012 Interim Tier 4</u>
<u>130 ≤ kW ≤ 560</u>	<u>2011 - 2017</u>	<u>Tier 3</u>
	<u>2014 - 2020</u>	<u>2011 Interim Tier 4</u>
<u>> 560 kW</u>	<u>2011 - 2017</u>	<u>Tier 2</u>
	<u>2015 - 2021</u>	<u>2011 Interim Tier 4</u>

SORE Evaporative Requirements (Handheld)

- Apply to small engines \leq 80 cc
- Typical equipment includes string trimmers, leaf blowers, and chainsaws

Effective Date Model Year	Applicability	Requirement Tank Permeation
2007	Equipment That Use Gasoline Powered Small Off-Road Engines With Displacements \leq 80 cc	Fuel Tank Permeation Emissions Shall Not Exceed 2.0 Grams Per Square Meter Per Day As Determined By TP-901.



SORE Evaporative Requirements (Small Non-Handheld)

- Apply to walk-behind mowers with engines > 80 cc to < 225 cc

	Performance Requirements Section 2754(a)	Design Requirements Section 2754(b)
Effective Date Model Year	Diurnal Standard Grams HC/day	Fuel Hose Permeation Grams ROG/m ² /day
2006	None	15
2007 and 2008	1.3	N/A
2009	1.0	N/A



SORE Evaporative Requirements (Small Non-Handheld)

- Apply to equipment other than walk-behind mowers with engines > 80 cc to < 225 cc

Effective Date Model Year	Performance Requirements Section 2754(a)	Design Requirements Section 2754(b)		
	Diurnal Standard Grams HC/day	Fuel Hose Permeation Grams ROG/m ² /day	Fuel Tank Permeation Grams ROG/m ² /day	Carbon Canister or Equivalent Butane Working Capacity Grams HC
2006	None	15	None	None
2007 through 2011	1.20 + 0.056*tank vol. (liters)	15	2.5	Specified in TP-902
2012	0.95 + 0.056*tank vol. (liters)	15	1.5	Specified in TP-902



New SORE Evaporative Requirements (Large Non-Handheld)

- Apply to large equipment like lawn tractors and generators with engines ≥ 225 cc

	Performance Requirements Section 2754(a)	Design Requirements Section 2754(b)		
Effective Date Model Year	Diurnal Standard Grams HC/day	Fuel Hose Permeation Grams ROG/m ² /day	Fuel Tank Permeation Grams ROG/m ² /day	Carbon Canister or Equivalent Butane Working Capacity Grams HC
2006 and 2007	None	15	None	None
2008	1.20 + 0.056*tank vol. (liters)	15	2.5	Specified in TP-902
2013	1.20 + 0.056*tank vol. (liters)	15	1.5	Specified in TP-902



SORE Exhaust Emission Standards (grams per kilowatt-hour)

<u>Model Year</u>	<u>Displacement Category</u>	<u>Durability Periods (hours)</u>	<u>Hydrocarbon plus Oxides of Nitrogen⁽²⁾⁽⁶⁾</u>	<u>Carbon Monoxide</u>	<u>Particulate</u>
<u>2005 and subsequent</u>	<u><50 cc</u>	<u>50/125/300</u>	<u>50</u>	<u>536</u>	<u>2.0⁽⁴⁾</u>
	<u>50-80 cc, inclusive</u>	<u>50/125/300</u>	<u>72</u>	<u>536</u>	<u>2.0⁽⁴⁾</u>
<u>2005</u>	<u>>80 cc - <225 cc Horizontal-shaft Engine</u>	<u>125/250/500</u>	<u>16.1</u>	<u>549</u>	
	<u>>80 cc - <225 cc Vertical-shaft Engine</u>	<u>NA</u>	<u>16.1</u>	<u>467</u>	
	<u>≥225 cc</u>	<u>125/250/500</u>	<u>12.1</u>	<u>549</u>	
<u>2006</u>	<u>>80 cc - <225 cc</u>	<u>125/250/500</u>	<u>16.1</u>	<u>549</u>	
	<u>≥ 225 cc</u>	<u>125/250/500</u>	<u>12.1</u>	<u>549</u>	
<u>2007</u>	<u>>80 cc - <225 cc</u>	<u>125/250/500</u>	<u>10.0</u>	<u>549</u>	
	<u>≥ 225 cc</u>	<u>125/250/500</u>	<u>12.1</u>	<u>549</u>	
<u>2008 and subsequent</u>	<u>>80 cc - <225 cc</u>	<u>125/250/500</u>	<u>10.0</u>	<u>549</u>	
	<u>≥ 225 cc</u>	<u>125/250/500/1000</u>	<u>8.0</u>	<u>549</u>	