

California Air Resources Board (CARB)
Large Spark-Ignition (LSI) Engine Fleet Requirements
Rule Summary

This document serves to summarize the fleet requirements of the California regulation for “*Off-Road Large Spark-Ignition Engines.*” [CCR 13 Section 2430]

The regulation applies to any operator in California with four or more forklifts and/or more four or more non-forklifts which include gasoline or propane fueled spark-ignition engines greater than 1L in displacement and rated at greater than 25 horsepower. Non-forklifts can include: sweepers/scrubbers, industrial tow tractors and airport ground support equipment.

A small sized fleet with less than 4 forklifts or 4 non-forklift pieces of equipment is exempted from this regulation.

A medium sized fleet is an operator with 4 to 25 pieces of LSI equipment.

A large fleet is an operator with more than 26 pieces of LSI equipment.

An operator is defined as a “person with legal right of possession and use of LSI engine equipment other than a person whose usual and customary business is the rental or leasing of LSI engine equipment.”

The rule requires fleet operators to comply with the following provisions:

1. Complete a baseline inventory of the company’s statewide fleet of both forklifts and non-forklifts within six months of adoption of this regulation; no later than **November 10, 2007**. Emission reduction targets must be met beginning on **January 1, 2009**. See table below.
2. Maintain (at the facility) this original baseline inventory and subsequent inventories indicating accessions and retirements until June 30, 2016. Note: if forklifts are located at several facilities throughout the state, records can be maintained in one central location.
3. Calculate the fleet average emissions of all forklifts and non-forklifts operated in California. These records must include: equipment type, make, model, serial number, and emission certification standards or retrofit verification level. Fleet operators must also maintain on file for three years information on the quality of propane fuel they purchased for their fleet that includes a written statement, product delivery ticket or receipt from the fuel supplier stating that the fuel supplied meets all applicable state and federal laws for use in their engines.

4. Meet the following average emission standards by the dates specified.

**Fleet Average Emission Standards in g/kW-hr (g/bhp-hr)
HC + NOx**

Fleet Type	1/1/2009	1/1/2011	1/1/2013
Large Forklift Fleet	3.2 (2.4)	2.3 (1.7)	1.5 (1.1)
Medium Forklift Fleet	3.5 (2.6)	2.7 (2.0)	1.9 (1.4)
Non-forklift Fleet	4.0 (3.0)	3.6 (2.7)	3.4 (2.5)

Note: electric forklifts are assumed to have zero emissions

5. Determine a compliance strategy based on emission rates from each existing piece of equipment. Strategies may include: purchase of new equipment, engine re-powers, or installation of CARB-verified retrofit kits.

Engine Control Systems TermiNOx™ is one of only two retrofit technologies approved for use by ARB and the only product verified broadly for engines from 1L to 8.2L in displacement.

The Engine Control Systems TermiNOx™ has been verified by CARB to reduce HC + NOx emissions from 1990 to 2000 unregulated and 2001 to 2003 non-complying phase-in off-road propane fueled LSI engines to the following levels

- for 1 to 3L displacement engines >25hp: to 1.3 g/kW-hr (1.0g/bhp-hr)
- for engines >3L displacement: to 4.0 g/kW-hr (3 g/bhp-hr)

6. Obtain bids for new equipment, re-powers or for retrofit with TermiNOx™.

Note on CARB Engine Family Names

An Engine Family Name is an alphanumeric code which is the legal identifier of an engine to the California and / or US EPA. For certified engines, engine manufacturers are required to affix a label to the engine listing the Engine Family Name. Lists of CARB Engine Family Names can be found at:

http://www.arb.ca.gov/msprog/offroad/cert/cert.php?eng_id=LSIE