

OVERVIEW OF THE

New Emission Standards, Test Procedures, and Fleet Requirements for Large Spark-Ignition (LSI) Engine Forklifts and Other Industrial Equipment

New rules to achieve significant emission reductions and protect public health

On May 25, 2006, the California Air Resources Board (ARB) amended the existing emission standards and test procedures for off-road large spark-ignition (LSI) engine powered equipment to make them more stringent. The ARB also adopted new regulations requiring emission reductions from existing LSI fleets and prescribing verification procedures for LSI retrofit emission control systems.

Why did the ARB staff propose these regulations?

There are more than 90,000 off-road LSI engines in California. Many of these engines have no emission controls and some remain in operator fleets for decades. Just one uncontrolled engine can emit as much hydrocarbon (HC) and oxides of nitrogen (NOx) in three eight-hour shifts as a new car certified to California's cleanest emission standard does over its entire lifetime. The HC and NOx combine in the atmosphere to form ground level ozone, which can damage the respiratory tract and worsen asthma symptoms. The LSI Regulation will reduce HC+NOx emissions by approximately six tons per day, helping California to meet federally imposed clean air standards. If these standards are not met, the federal government could impose economic sanctions on California; for example, federal highway funding could be withheld.

Who must comply with these regulations?

Manufacturers of 25 horsepower or greater (greater than 19 kilowatts) off-road LSI engines must comply with the new engine standards and test procedures and manufacturers of retrofit emission control systems intended for use on LSI engines must comply with the verification procedures.

Individual persons, businesses, and government agencies that own or operate LSI engine-powered fleets in California are subject to the fleet requirements. Out-of-state companies doing business in California are also subject to the fleet requirements.

What types of vehicles are subject to the regulation?

The new engine emission standards apply to manufacturers of any 25 horsepower or greater off-road LSI engine placed in, but not limited to, airport ground support equipment (GSE), forklifts, generator sets, sweeper/scrubbers, industrial tugs (tow tractors), and turf care equipment. A full list of LSI equipment for which the engine standards apply is available at <http://www.arb.ca.gov/msprog/offroad/preempt.htm>

The fleet requirements only apply to forklifts, sweepers/scrubbers, industrial tow tractors, and GSE. Those four categories of equipment represent 94 percent of the total HC and NOx emissions from LSI equipment and are often found in fleets. Additionally, zero- and near zero-emission alternatives are available for the four equipment categories.

What does the regulation require?

Engine and Retrofit Emission Control System Manufacturers

The regulation establishes more stringent combined HC and NOx emission certification standards for engine manufacturers. The regulation also establishes verification procedures for manufacturers of retrofit emission control systems. Engine and retrofit emission control system manufacturers will likely employ advanced automotive-style emission control technologies including electronic fuel/air controllers, three-way catalysts, and oxygen sensors to meet the certification and verification standards, respectively.

In-Use Fleets

The regulation also establishes fleet average emission level requirements (fleet average) for medium and large fleets that become more stringent with time. The requirements for forklifts are more stringent than those for non-forklift equipment because the number of lower-emission retrofit kit and electric forklift options are greater. Agricultural fleets are not required to comply with the fleet average, but must address all 1990 and newer uncontrolled forklifts.

When do the requirements take effect?

Requirement	Date
New engine certification standard and associated test procedures	January 1, 2007
Retrofit emission control system verification procedures	May 12, 2007
In-use fleet average requirements (three effective dates)	January 1, 2009; January 1, 2011; January 1, 2013
More stringent new engine certification standard and test procedures	January 1, 2010

What are the estimated benefits of the regulation?

The regulation is expected to reduce HC and NOx emissions by 5.7 tons per day in 2010 and 6.2 tons per day in 2020 – the equivalent of removing 200,000 cars from the road. Several engine manufacturers have introduced engines certified to optional lower emission standards early, so the emission benefits between 2007 and 2010 will be greater than expected, helping us to meet federal clean air standards.

What are the estimated costs?

ARB staff estimates that the total cost of compliance with the regulation for affected businesses will be approximately \$8 million. The ARB estimates that the cost effectiveness of the rule making will be no more than \$1.40 per pound of HC and NOx reduced. The cost-effectiveness of the rule making compares favorably with other mobile source regulations that are typically in the range of \$5 per pound of HC and NOx emissions reduced.

Where can I find more information about the regulation?

The LSI staff report and regulatory text can be accessed from <http://www.arb.ca.gov/regact/lore2006/lore2006.htm>

Further information, including other fact sheets, presentations, frequently asked questions, and a list of verified retrofit emission control systems, is available on the LSI regulation website at <http://www.arb.ca.gov/msprog/offroad/orspark/orspark.htm>

For additional general information

For general information, please contact ARB's LSI hotline toll-free at (800)387-2992. You may also obtain this document in an alternative format by contacting the ARB at (916) 322-4505 (voice); (916) 324-9531 (TDD, Sacramento area only); or (800) 700-8326 (TDD, Outside Sacramento). TTY/TDD/Speech-to-Speech users may dial 711 for the California Relay Service.