FACTS ABOUT

New Emission Standards for Large Spark-Ignition (LSI) Engines (greater than 1 liter)

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 further control emissions. For general information regarding this regulation, please see: Overview of the New Emission Standards, Test Procedures, and Fleet Requirements for Large Spark-Ignition (LSI) Engine Forklifts and Other Industrial Equipment.

Why do we need more stringent standards?

The ARB first regulated LSI engines in 1998, setting a hydrocarbons and oxides of nitrogen (HC+NOx) emission standard of 3.0 grams per brake horsepower-hour (g/bhp-hr) that relied upon automotive-style emission control technology. The standard, which was phased-in between 2001 and 2004, represented a 75 percent reduction from uncontrolled levels.

In 2004, LSI engines were still emitting about 70 tons of HC+NOx into California's atmosphere each day. These two pollutants combine, in the presence of sunlight, to form ozone, which is a significant contributor to California's air quality problems. Simultaneously, manufacturers of emission control systems were demonstrating that they could attain HC+NOx emission level reductions of 90 percent or more versus the 1998 standard with improved fuel metering and more robust three-way catalytic converters. Given California's need to obtain additional emission reductions, the ARB saw this as a significant opportunity to reduce emissions further.

What do the new EPA and ARB regulations require?

In 2002, the United States Environmental Protection Agency adopted a regulation for LSI engines. The regulation established a nationwide 3.0 g/bhp-hr standard beginning in 2004 and a more stringent 2.0 g/bhp-hr standard beginning in 2007. It additionally contained evaporative emission and in-use requirements not contained in ARB's 1998 regulation.

The ARB amendments first harmonize with the U.S. EPA regulation by adopting the same emission standards and in-use requirements beginning in 2007. They then become more stringent, establishing a 0.6 g/bhp-hr standard effective January 1, 2010.

Additionally, they provide that manufacturers may optionally certify to prescribed emission standards below the 2.0 g/bhp-hr and 0.6 g/bhp-hr emission standards.

Who is subject to the regulation?

The U.S. EPA preempts the ARB from regulating construction or farm equipment with LSI engines of 25 – 175 horsepower. The ARB's LSI engine standards and test procedures apply to manufacturers of 25 horsepower or greater off-road LSI engines placed in any of the following non-preempt pieces of equipment:

- Forklifts that are neither rough terrain nor powered by diesel engines
- Airport ground power
- Baggage handling
- Tow/Push
- Scrubbers/Sweepers
- Generator sets
- Turf Care Equipment
- Mining equipment not primarily used in the construction industry
- Refrigeration units less than 50 horsepower
- Other Industrial Equipment

When do the requirements take effect?

The 2.0 g/bhp-hr standard took effect on January 1, 2007. The 0.6 g/bhp-hr standard takes effect on January 1, 2010; however, several manufacturers have already certified engines to the 2010 standard.

What is the estimated cost to manufacturers?

The ARB does not expect California's harmonization with the U.S. EPA's 2007 2.0 g/bhp-hr standard to result in significant additional work or costs because manufacturers have already developed engines to comply. Most of these engines are expected to use the same hardware to meet the ARB's 2010 0.6 g/bhp-hr standard, although calibration changes will be needed. Conservatively, ARB estimates that 25 percent of all engines would need improvements to the catalyst system (increased volume and/or precious metal loading) resulting in an average hardware cost increase of 40 percent or about $120. Spread out over all engines, the average incremental cost is about $30 per engine. With expected research and development, in-use testing, and certification, the total incremental cost is about $80 per engine. The ARB expects that most, if not all, of this incremental additional cost will be passed along to consumers.

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 Help Line 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.