

California Air Resources Board

UPDATED INFORMATIVE DIGEST

NEW EMISSION STANDARDS, FLEET REQUIREMENTS, AND TEST PROCEDURES FOR FORKLIFTS AND OTHER INDUSTRIAL EQUIPMENT

Sections Affected: Adopt California Code of Regulations, title 13, division 3, chapter 15, Additional Off-Road Vehicles and Engines Pollution Control Requirements, article 2, Off-Road Large Spark-Ignition Engine Fleet Requirements, sections 2775, 2775.1, and 2775.2; and division 3, chapter 15, Additional Off-Road Vehicles and Engines Pollution Control Requirements, article 3, Verification Procedure, Warranty, and In-Use Compliance Requirements for Retrofits to Control Emissions from Off-Road Large Spark-Ignition Engines, sections 2780 through 2789; and amend California Code of Regulations, title 13, division 3, chapter 9, Off-Road Vehicles and Engines Pollution Control Devices, article 4.5, Large Spark-Ignition Engines, sections 2430, 2433, 2433, 2334, and 2438, and amend the incorporated “California Exhaust Emission Standards and Test Procedures for New 2001 Through 2006 Off-Road Large Spark-Ignition Engines, Parts I and II,” and adopt the incorporated “California Exhaust and Evaporative Emission Standards and Test Procedures for New 2007 through 2009 Off-Road Large Spark-Ignition Engines,” the “California Exhaust and Evaporative Emission Standards and Test Procedures for New 2010 and Later Off-Road Large Spark-Ignition Engines,” and the “California Exhaust and Evaporative Emission Standards and Test Procedures for New 2007 and Later Off-Road Large Spark-Ignition Engines (Test Procedures 1065 and 1068).”

Background: Health and Safety Code sections 43013(b) and 43018 provide broad authority for the Air Resources Board (ARB or Board) to adopt emission standards and other regulations to reduce emissions from vehicular and other mobile sources.

In 1998, ARB first adopted emission standards for new spark-ignited engines used in forklifts and other similar industrial equipment. These engines are referred to as large spark-ignition (LSI) engines. In addition to forklifts, the LSI category includes airport ground support equipment, sweepers and scrubbers, generator sets, small irrigation pumps, and a variety of other similar equipment. The full implementation of these first emissions standards in 2004 required engine manufacturers to achieve approximately a 75 percent reduction in smog-forming pollutants. This was done with the incorporation of basic emissions control technology that had been successfully used in passenger cars for more than 20 years.

The 75 percent reduction was an important step, but still left the level of control for these new engines relatively basic. Building on this success, the United States Environmental Protection Agency (U.S. EPA) harmonized with California’s standards and adopted more stringent requirements for new engines produced for the 2007 and

later model years. The federal program demonstrated that additional reductions from new engines were technically feasible and cost-effective.

In developing the ARB's 2003 State Implementation Plan for Ozone, it became clear that additional emissions reductions were possible from not only new engines, but also from in-use equipment. The regulation of in-use industrial equipment represents an enormous opportunity since each uncontrolled forklift has the same emissions impact per day as over 700 clean passenger cars. The Board's State Implementation Plan for Ozone included a commitment to achieve additional reductions from the LSI category of between 6.1 and 13.0 tons per day of hydrocarbons (HC) and oxides of nitrogen (NOx) statewide by 2010.

In June 2005, the ARB staff presented an initial proposal to the Board. At that time, questions arose about the economic impact of the in-use portion of the proposal on forklift dealers and agricultural-related businesses. In addition, several stakeholders asked for more time to work with staff on the regulatory proposal. Accordingly, the Board consented to hear staff's presentation and public testimony but deferred action to a later date. Subsequent to the June 2005 hearing, ARB staff conducted numerous meetings and telephone conversations with dealer and agricultural business representatives in order to better understand their business practices and the economic impacts of the proposal.

The Board considered a revised staff proposal at its May 25, 2006 public hearing. The 2006 proposed regulations were similar to the 2005 proposal, but revised several key provisions to reduce the economic impacts on agricultural businesses and address the unique business practices of forklift dealers. After considering the staff's presentation and the public's written comments and testimony, the Board approved staff's proposal with modifications and directed the staff to make the Board's approved modifications, along with any consistent conforming changes, available to the public for supplemental notice. The modifications are described and the responses to all public comments and testimony are available in the Final Statement of Reasons for the rulemaking at <http://www.arb.ca.gov/regact/lore2006/lore2006.htm>.

The 2007 new engine emission standards are not expected to create significant economic impacts because engine manufacturers are already developing engines to comply with the parallel federal 2007 standards. The ARB's standards for 2010 and later can be met by optimizing emission controls used to meet the 2007 standards, and thus provide extremely cost effective emission reductions.

In general, in-use fleet rules provide significant opportunities for emissions reductions but also require careful consideration due to their possible economic impacts on owners and users of the equipment. In many ways, the LSI category is well-positioned to achieve in-use emissions reductions. Available retrofit technology reduces emissions by 75 to 90 percent and is cost-effective. Because emission standards for new engines have been in effect only for the past few years, a significant number of high-emitting, uncontrolled pieces of equipment are still in operation and available for retrofit.

Operators can meet the in-use fleet-average emission standards by procuring low- and zero-emission equipment and by retrofitting uncontrolled equipment in their fleets. The use of new controlled engines and the retrofit of existing engines can reduce fuel use and improve engine life, creating cost savings that offset a portion of the additional equipment cost. As a result, the fleet requirements are cost-effective and range from \$0.13 per pound for lower-emission equipment to \$1.40 per pound of HC + NO_x reduced for electric equipment.

The in-use fleet-average emission standards will result in additional costs for some dealers of industrial equipment. The costs depend on the number and age of the uncontrolled equipment in their possession, the rate at which they currently replace equipment, the extent to which additional costs can be passed along, and the ability to sell equipment to small fleets that are exempt from the regulations. This latter provision significantly reduces the economic impact on dealers.

The approved regulations will reduce statewide HC and NO_x emissions by 5.7 tons per day in 2010 and 6.2 tons per day in 2020. These reductions are near or within the range of the commitment established within the 2003 State Implementation Plan for Ozone.

Description of the Regulatory Action: The approved regulation contains three components that affect manufacturers of LSI engines. The first component, harmonizes the ARB standard with the more stringent U.S. EPA's emission standards and test procedures that became effective with the 2007 model year.

The second component would require that new 2010 and subsequent model-year engines meet a standard 70 percent lower than the 2007 standard. By raising the allowable carbon monoxide standard, lower ozone-forming emissions can be achieved.

The third component establishes optional lower emission standards (OLES) below the 2007 and 2010 mandatory standards. Under this component, engines could be certified as OLES engines. Demand for these engines is created by the regulations for fleet operators.

To address emissions from high-polluting, uncontrolled in-use engines and to encourage the use of zero-emission and lower-emission equipment, the approved regulations contain fleet average emission level requirements for large and mid-size fleets using forklifts, industrial tow tractors, sweepers/scrubbers, and airport ground support equipment. Fleet size is determined by aggregating each operator's equipment in California: large fleets are defined as those with more than 25 pieces of equipment while mid-size fleets are those with 4 to 25 pieces of equipment.

Large fleets have to meet more stringent fleet averages than mid-size fleets because they have greater flexibility when incorporating combinations of emission-reduction strategies to achieve an established level. Additionally, the fleet average is more stringent for the forklift portion of the fleet than for the non-forklift portion of the fleet.

Small fleets, those with one to three pieces of equipment, are exempt from the fleet average requirement. Exempting small fleets greatly reduces the number of businesses impacted and significantly reduces the impact on equipment dealers.

The regulation provides operators of LSI fleets with the flexibility to incorporate any combination of retrofits, low-emission purchases, and zero-emission electric purchases to meet the fleet average emission level.

The regulation provides an alternative compliance option for agricultural-related fleets that reflects the longer retention period characteristic of agricultural operations. Under this option, agricultural fleet operators are required to control only their 1990 and newer uncontrolled forklifts for which there are commercially available retrofit control systems available. The compliance timeframes provide operators an opportunity to receive public incentives covering up to 80 percent of the cost to address the affected fleet.

Finally, the regulations establish a verification procedure for retrofit emission control systems that may be used to meet the proposed fleet average emission requirements. Such procedures ensure that the retrofit systems deliver real and quantifiable emission reductions.

Comparable Federal Regulations: The United States Environmental Protection Agency adopted emission standards for LSI engines beginning with the 2004 model year. The federal standards and test procedures are found in title 40, Code of Federal Regulations, parts 1048, 1065, and 1068. The ARB's requirements harmonize with the federal program for 2007 through 2009. The ARB's LSI standards require even cleaner engines in 2010 to achieve additional emission reductions as required by the 2003 State Implementation Plan for Ozone. The inclusion of a fleet average requirement, which is not a part of the federal program, addresses in-use emissions. Currently, there is no federal verification procedure for LSI engine retrofit control systems for in-use engines.