



# Regulatory Advisory

April 2009



LSI Advisory: 08-03

## **EXCLUDE FROM THE FLEET AVERAGE CALCULATION FULLY CONTROLLED LATE MODEL YEAR LSI EQUIPMENT FLEETS AND LSI EQUIPMENT WITH ENGINES GREATER THAN THREE LITERS IN DISPLACEMENT; EXTEND DEADLINE FOR USE OF PURCHASE ORDERS IN THE FLEET AVERAGE CALCULATION**

### **Background**

At its May 25, 2006 public hearing, the California Air Resources Board (ARB) amended the existing emission standards and test procedures for off-road large spark-ignition (LSI) engines to make them more stringent (the LSI Regulation). Concurrently, ARB adopted new fleet average emission level (FAEL) standards for existing fleets of LSI engine-powered forklifts, airport ground support equipment, sweeper/scrubbers, and industrial tugs (tow tractors). The standards become progressively more stringent over time, requiring fleet operators to reduce their fleet average emission level through retrofit or replacement of equipment without emission controls and procurement of electric or cleaner LSI engine equipment. As adopted, the first fleet average emission level standard effective date is January 1, 2009.

### **What are the issues?**

The ability of LSI fleet operators to bring their fleets into compliance with 2009 and subsequent FAEL standards has been hindered in instances where their fleets are predominantly comprised of equipment with an engine displacement of greater than three liters or recent model year controlled engines. The issues associated with these types of LSI equipment are discussed below.

#### Engine Displacement Exceeds Three Liters

The FAEL standards were based upon industry average fleet turnover information. Businesses with a routine turnover rate of seven years or less would be expected to attain the FAEL standards without having to take extraordinary measures. But those businesses with older equipment or a longer turnover rate would have to make a more concerted effort to attain the FAEL standards by obtaining the cleanest retrofits and new equipment available.

The FAEL standards were also based upon the availability of clean, new LSI engines certified to a hydrocarbon and oxides of nitrogen (HC+NO<sub>x</sub>) emissions standard of 2.0 grams per brake horsepower-hour (g/bhp-hr) and retrofit kits verified to an HC+NO<sub>x</sub> emission standard of 3.0 g/bhp-hr in the 2007-2009 time frame. Original equipment manufacturers (OEMs) and retrofit kit manufacturers have made meeting the FAEL

standards easier, even for operators with a longer turnover rate, by introducing extremely low emission options for LSI equipment with engine displacements of three liters or less (four-cylinder engines) beginning early in 2007. Offerings include 0.6 g/bhp-hr engine equipment from several OEMs and two 1.0 g/bhp-hr retrofit kits from the retrofit kit manufacturers.

However, OEMs and retrofit kit manufacturers found it more difficult to control HC+NO<sub>x</sub> emissions from engines with a displacement greater than three liters (both six cylinder and eight cylinder engines) and in particular, the General Motors (GM) 4.3 liter engine used by most OEMs in their six-cylinder LSI engine equipment. In fact, none of the OEMs certified their GM 4.3 liter engine below a 2.0 g/bhp-hr emission standard, and only one retrofit kit was verified for greater than three liter engines – at 3.0 g/bhp-hr. This means that operators of LSI equipment powered by uncontrolled engines with greater than three liters displacement (and a default emission rate of 12.0 g/bhp-hr) will have greater difficulty complying with the FAEL standards.

### Late Model Certified Engines

Some operators chose to address company expansion or routine turnover needs by leasing or purchasing entire fleets of recent model year emission-certified LSI engine equipment. These 2006 and older model year pieces of equipment are controlled to a 3.0 g/bhp-hr standard and based upon routine turnover assumptions, would not be expected to leave the fleet for seven years. But without turnover to cleaner equipment, this fleet would not be able to meet the 2009 and 2011 FAEL standards.

### **How is ARB addressing these issues?**

ARB anticipated that some LSI equipment operators might encounter difficulties obtaining retrofit kits for certain engines in a timely manner. To address this, ARB added provisions to the LSI Regulation granting the Executive Officer of ARB the authority to grant a one-year extension in compliance in the event that the Executive Officer had not verified a retrofit kit or a retrofit kit was not commercially available for a particular engine and equipment combination.

ARB has determined that each of the above issues may impact an operator's ability to comply with the FAEL standard through retrofit or replacement of existing LSI equipment. Therefore, an extension in compliance, as provided for in the LSI Regulation is warranted and is discussed below.

### Engine Displacement Exceeds Three Liters

The issue with greater than three liter engines is a short-lived one because all OEMs will begin marketing six and eight cylinder engine equipment certified to the 2010 HC+NO<sub>x</sub> emission standard of 0.6 g/bhp-hr beginning in January 2010 or earlier. The ARB will also be verifying a retrofit kit to a 2.0 g/bhp-hr emission level within the next month. While the retrofit kit will assist with short term compliance, in the long term, fleet operators, especially operators of large fleets, will have to rely more extensively on OEM equipment.

ARB realizes that it may not be possible for LSI fleet operators to meet the FAEL standards in the interim period preceding introduction of OEM and retrofit choices for their uncontrolled greater than three liter engine equipment. Thus, ARB will allow LSI fleet operators to exclude their uncontrolled greater than three liter engine equipment from their fleet average calculations through April 15, 2010. Commencing April 16, 2010, fleet operator inventories must again include all greater than three liter engine equipment in the operator's fleet.

### Late Model Certified Engines

As discussed previously, the FAEL standards are based upon a seven-year turnover rate. ARB will allow fleets comprised entirely of OEM controlled LSI engine equipment as of January 1, 2009, to address their equipment as follows:

- Equipment leased on or after January 1, 2004 may be excluded from the fleet average calculation through April 15, 2010. ARB will revisit the availability of retrofit kits for controlled lease equipment and the need for any additional exclusion periods prior to the end of this one-year exclusion.
- Owned equipment for which retrofit kits are not available may be excluded from the operator's fleet average calculations through April 15, 2010. ARB will revisit the availability of retrofit kits for controlled owned equipment and the need for any additional exclusion periods prior to the end of this one-year exclusion.
- Owned equipment for which retrofit kits are available may not be excluded from the operator's fleet average calculations.

### **What about lead time?**

Most of the OEMs will not make their 0.6 g/bhp-hr greater than three liter engine equipment available until January 2010. Additionally, turn around time for retrofit kits from date of order until installation can be a few months. This may make it difficult for fleet operators to take delivery of the equipment prior to April 16, 2010, when fleet operator inventories will again have to reflect all greater than three liter engine equipment. Thus, ARB will allow 0.6 g/bhp-hr greater than three liter engine equipment and 2.0 g/bhp-hr retrofit kits for installation on greater than three liter engine equipment that were leased or purchased on or before April 15, 2010, to be incorporated into the fleet average calculation for determining compliance with the January 1, 2009 FAEL standard. Evidence of purchase may be a purchase order or equivalent document.

The 0.6 g/bhp-hr certification standard for an OEM piece of equipment intended as a replacement may be used in place of either the certification standard or default uncontrolled emission rate associated with the piece of equipment being replaced until the newly purchased piece of equipment is physically in the fleet as evidenced by inventory records.

The 2.0 g/bhp-hr verification absolute emission level (standard) for a retrofit kit may be used in place of either the certification standard or default uncontrolled emission rate associated with the piece of equipment being retrofitted until the retrofit kit has been installed as evidenced by inventory records.

In either case, the newly leased or purchased piece of equipment or newly purchased retrofit kit must be physically in the fleet or installed, respectively, on or before December 31, 2010.

**For more information**

To obtain a copy of the regulation or other related compliance assistance documents, visit the LSI website at [www.arb.ca.gov/lsi](http://www.arb.ca.gov/lsi). Additional questions may be addressed by calling the toll-free DOORS Hotline at (877) 59DOORS (877-593-6677) or via email at [doors@arb.ca.gov](mailto:doors@arb.ca.gov).