STATEMENT
OF THE
MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION
ON THE CALIFORNIA AIR RESOURCES BOARD'S PROPOSED
EMISSION STANDARDS AND TEST PROCEDURES FOR NEW 2007
AND LATER OFF-ROAD LARGE SPARK-IGNITION (LSI) ENGINES
AND FLEET REQUIREMENTS FOR USERS OF OFF-ROAD LSI ENGINES

May 25, 2006

The Manufacturers of Emission Controls Association (MECA) is pleased to provide comments in support of the California Air Resources Board's (CARB) proposal for new 2007 and later emission standards and test procedures for off-road, spark-ignited engines with horsepower ratings greater than 25 horsepower, and fleet requirements for users of these engines.

MECA is a non-profit association made up of the world's leading manufacturers of emission control technology for on-road and off-road vehicles and engines, as well as stationary IC engines. MECA's member companies have over 30 years of experience and a proven track record in developing and commercializing emission control technologies for a wide range of vehicles and engines. These companies have developed control technologies for gasoline, diesel, and alternative-fueled engines, including off-road spark-ignited engines.

The technology to reduce emissions from spark-ignited, off-road engines, in applications included in the proposed ARB regulations, is based on automotive-type three-way catalyst closed-loop technology. This technology has been used on well over 300,000,000 automobiles with outstanding results. Three-way catalysts have also been used effectively on thousands of large, natural gas-fueled, reciprocating engines (so-called rich burn or stoichiometric natural gas engines) used for power production or pumping applications. These same catalyst technologies can be adapted to spark-ignited engines used in off-road mobile sources such as forklift trucks, airport ground support equipment, and portable generators.

Closed-loop, three-way catalyst-based systems are already being used on these large, spark-ignited, off-road engines to meet ARB's and EPA's 2004 3.0 g/bhp-hr HC + NOx standard. Closed-loop, three-way catalyst systems will also be the primary technology pathway for meeting EPA's and the proposed ARB 2007 exhaust emission standard of 2.0 g/bhp-hr HC + NOx. Retrofit kits that include air/fuel control systems along with three-way catalysts have been sold into the LPG-fueled fork lift industry for installation on uncontrolled engines (an LSI application) for nearly 10 years. In both new engine and retrofit applications, these closed-loop three-way catalyst systems have shown durable performance in LSI applications, consistent with the excellent durability record of closed-loop three-way catalyst systems used in automotive applications for more than twenty-five years.

MECA agrees with the ARB staff assessment that significant improvements in three-way catalyst system performance can be achieved in these LSI applications by readily available catalyst design changes and optimizations that more closely approach the catalyst designs used in modern light-duty automobiles. These design changes include the use of high performance catalyst formulations with layered catalyst architectures and the latest oxygen storage promoters, larger catalyst volumes relative to the engine displacement, and the use of higher cell density metallic or ceramic substrates. These advanced catalysts coupled with improved engine control strategies are already beginning to find use on some new LSI engines as evidenced by some of the very low emission levels reported to ARB in recent LSI engine certifications (as reported in the ARB staff initial statement of reasons for these proposed rules). Advanced catalysts and advanced engine controls will also provide the technical solutions needed to achieve ARB's proposed 2010 0.6 g/bhp-hr HC + NOx exhaust emission standards for off-road LSI engines included in the proposal. Advanced catalyst systems can be used to certify off-road LSI engines to some of the optional low emission certification standards included in this proposal ahead of the 2007 or 2010 requirements for new engines.

MECA supports ARB's proposal to include verified retrofit systems as an option for fleet users to comply with proposed fleet emission requirements for off-road LSI engines. Retrofit systems based on closed-loop control with three-way catalysts have already proven to be a robust solution for reducing emissions from uncontrolled, in-use LSI engines. As detailed in the March 3, 2006 staff report, one manufacturer has already verified a retrofit system for a range of uncontrolled, off-road LSI engines. This verified retrofit system brings uncontrolled, 12 g/bhp-hr HC + NOx equipment down to 1.0 g/bhp-hr HC + NOx emission levels, an emissions level well below the 2004 3.0 g/bhp-hr HC + NOx certification requirements for new equipment. MECA fully expects additional manufacturers to verify cost-effective, durable retrofit options for these LSI applications using the available interim and proposed final verification protocols. ARB's proposed verification protocols provides end-users and ARB with needed assurances that retrofit options will deliver real emission reductions over the required warranty period. MECA would ask ARB to ensure that adequate resources are available to manage ARB's retrofit verification program to minimize delays in approving valid retrofit verification applications.

Fuel quality will play an important role in the successful use of advanced three-way catalyst systems to achieve ARB's proposed 2007 and 2010 emission standards for new LSI engines, optional lower certification emission standards for new engines, and retrofit applications verified at some of the lower absolute emission levels (or highest conversion efficiencies) included in this ARB proposal. The importance of fuel quality in an overall systems approach to reducing exhaust emissions has clearly been demonstrated in the automotive industry for both gasoline and diesel fuel. The same attention to fuel quality is necessary with LPG fuel used by off-road LSI engines. MECA asks ARB to continue its efforts to work with industry to determine if existing LPG specifications for off-road engines are adequate to support the more stringent emission standards included in this proposal.

In closing, MECA believes that advanced three-way catalyst technology based on automotive applications can provide a cost-effective, durable, high performance solution for controlling HC and NOx emissions from new and existing large spark-ignited engines used in

off-road applications. MECA believes that ARB's proposed 2007 and 2010 exhaust emission regulations for new engines are technically feasible. Durable retrofit options will be verified and available using the proposed ARB verification protocols to assist end-users in meeting the proposed fleet-average emission requirements. MECA members are committed to working with engine manufacturers and end-users to provide proven emission control solutions to meet California's emission standards for both new and existing off-road, large spark-ignited engines.

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