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New Study on EU Stage IV NOx Aftertreatment Technology

Stage IV emission standards for nonroad mobile machinery engines, as laid down in EU Directive 2004/26/EC, will require internal engine measures as well as aftertreatment measures. Exhaust aftertreatment, especially for NOx reduction toward future emission limits, cannot be considered as a single step technology. Since both technology steps are new to the majority of NRMM engines, Euromot has contracted a feasibility study to AVL List GmbH investigating into the applicability of available onroad NOx reduction technologies for CI engines to nonroad conditions and their relation to PM abatement. The main focus of the study, however, is related to aftertreatment technologies such as Selective Catalytic Reduction (SCR) and Lean NOx Trap (LNT).

In summary, Stage IV development of new engines and new aftertreatment systems for the broad scope of NRMM types will become a big challenge in view of several aspects: development time, cost for engineering and application, especially for smaller engines in the 56 to 130kW power category, cost of documentation and cost of new technology parts of exhaust aftertreatment systems. A step-by-step introduction of new technologies, i.e. phase-in of new regulations will help the manufacturers to develop low emission and high fuel economy engines meeting the customer requirements on durability, maintenance and costs without distortion of competition.

In addition, the availability of ultra low sulphur fuel (ULSD) must be mandatory all over the EU at least one year prior to the introduction of Stage IIIB. 15 ppm S fuel will be available in the US from 2010 (NRMM) and 2012 (marine and rail) on. Any delay in introducing ULSD in Europe will put the introduction of NRMM aftertreatment technology at risk.

Summary content:

- review of NOx and PM reduction technologies from onroad CI engines
- main strategies for meeting future emission standards
- technologies for in-cylinder engine emission reduction
- exhaust aftertreatment technology and onroad experience
- compatibility of NOx and PM abatement technologies

- nonroad specific constraints
- fuel quality
- sales volumes
- load cycle data

- technology options to meet Stage IV emission standards
- exhaust temperature level in duty cycles
- combination of PM and DeNOx systems

- daily-use challenges for NRMM with DeNOx and PM Filter
- packaging
- urea-water infrastructure, storage, consumption
- miss-fuelling

EUROMOT represents the leading manufacturers of internal combustion engines used in a broad range of non-road and marine applications (construction, mining and material handling equipment, trucks and buses, agricultural and forestry equipment, commercial marine and seagoing vessels, workboats and pleasure boats, rail traction, lawn/garden and recreational equipment, power generation). EUROMOT has been working for many years with international regulatory bodies, eg European Union, the UN Economic Commission for Europe (UNECE), the UN International Maritime Organizations (IMO) and the Central Commission for the Navigation on the Rhine (CCNR), and with national governments to provide reliable know-how on advanced internal combustion engine technologies in general and, in particular, on the feasibility of environmental as well as cost-effective product regulations.

For further information about our Association, please pay us a virtual visit at <http://www.euromot.info> – your bookmark for engine power worldwide, or contact:

The European Association of Internal Combustion Engine Manufacturers - EUROMOT

Communications & Media Relations, Petra Tutsch, Lyoner Strasse 18, 60528 Frankfurt/M., Germany
fon: 0049 69 6603-1457, fax: 0049 69 6603-2457, eMail: euromot@vdma.org