



Lombardini Unveil Major Tier IV Innovation

WITH several engine manufacturers having already launched Tier 4 offerings using DPF (Diesel Particulate Filter) technology, Lombardini Kohler have announced the launch of Kohler Direct Injection, minus the use of after treatment systems and a system what many manufacturers have already stated would be their preferred choice for Tier IV.

From 2013, Tier IV will be brought in for all diesel engines in the above 19 - 56 kW in the US and as Stage IIIB, above 37-56 kW in the EU – this represents levels at an astounding one tenth of the presently already reduced limit.

Engineering director Guiseppe Duri has been the driving force behind this project.

"We did indeed, like many others, investigate DPF technology but we soon discovered that that DPF gave problems for manufacturers using smaller engines. The DPF can get clogged and needs to be cleaned, it can impact negatively on fuel economy, it will increase heat rejection in the engine compartments, it is bulky and is an expensive extra component.

"The only alternative was to achieve a clean combustion.

"Kohler/Lombardini have chosen the most advanced common rail system available on the market. It's specifically designed for extreme durability and resistance to the highly severe conditions of operation that are typical of applications in the industrial and building construction sectors. The high pressure pump operates at 2000 bars. This feature, combined with G3S solenoid-type injectors, enables fuel optimization during injection."

ADVANTAGE FOR MANUFACTURER AND USER

The absence of after-treatment systems offers countless advantages for both the manufacturer and the user. In fact, thanks to the advanced injection

system (with 2000 bar Common Rail, EGR valve and 4 valves per cylinder), no DPF is required as project manager Massimiliano Bonanni explains; "The 2000 bar injection pressure

creates a very fine and highly penetrating spray that ensures clean combustion.

"The adoption of a waste-gated turbocharge together with the 2000 bar injection and the 4-valve layout greatly reduce the particulate matter output, hence the possibility of avoiding the DPF.

"Particulate matter reduction was not the only problem to be overcome. The consequential NOx formation, due to clean combustion and high temperatures, is controlled through cooled exhaust gas recirculation managed by the electronic control unit.

"The EGR valve is located upstream of the main EGR cooler in order to avoid valve sticking, while the exhaust gas is cooled through a two-stage system – a gas flow inside the cylinder head and a main liquid cooler.

"The performance achieved by these engines is best in class with regards to power and torque density, low end torque value, along with excellent fuel economy – 3/5% and up to 10% – and extended oil change intervals of 500 hours."

The immediate resulting advantage is reduced external dimensions.

LARGER ENGINE TO COME

Production of the 1.9L and 2.5L models will begin in the fourth quarter of 2012 and the company hopes to have a 3.4L model in production by the end of 2014, a first in this size of engine for the Kohler/Lombardini.

In concluding Lombardini managing director Guiseppe Bava added that the new KDI engine range would add significantly to the present 150,000 engine production output appealing to a wide range of manufacturers in various markets from construction, materials handling, agriculture and power access, many of whom were already Kohler/Lombardini customers.

The new KDI engines will be seen for the first time in the UK at the Executive Hire Show in February in Coventry.

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