

### **New Generation Diesel Engines for Liebherr Mobile Harbour Cranes**

- Meet stage IV / Tier 4 final emission requirements
- Optimised exhaust gas after-treatment with Selective Catalytic Reduction
- Reduction of nitrogen oxides by approximately 98%
- Less fuel consumption and more power

**Nenzing (Austria), May 2015 – In order to meet the required emission and fuel consumption targets, Liebherr enhanced the diesel engines for its mobile harbour crane (LHM) fleet.**

The smaller crane models LHM 120, LHM 180 and LHM 280 will be equipped with a stage IV / Tier 4 final 400 kW engine. The bigger crane models LHM 420, LHM 550, LHM 600 and the new giant LHM 800 are available with a stage IV / Tier 4 final 725 kW diesel engine. Both diesel engine versions can be boosted with the Pactronic® hybrid drive system for up to 100% extra power.

For the latest European Union emission standard stage IV and Tier 4 final of the US Environmental Protection Agency respectively, Liebherr has intensively optimised the whole combustion process. Compared with other solutions, Liebherr developed a simple but effective solution that reduces the nitrogen oxides (NOx) emissions while cutting operating costs.

#### **Selective Catalytic Reduction**

An essential part of the new engine generation is the gas emission treatment. To simplify the system and to optimize exhaust gas after-treatment, Liebherr engineered the Selective Catalytic Reduction technology (SCR), which reduces particles to a minimum already inside the engine. This leads to economic advantages for the customer: As the particle emissions are already lower than the emission limits, no more reduction measurements are necessary. In this

sense, the motor's characteristics in terms of power, efficiency and economy are further optimized. The newly designed SCR catalyst and all other system components such as injector, air- and AdBlue-pump contribute to a significant NOx reduction of approximately 98%.

### **The same basic engine for all emission standards**

With the stage IV / Tier 4 final, Liebherr offers a standardized basic engine that can be adapted to the emission requirements in different markets and regions by minor modifications or by fitting exhaust gas after-treatment systems.

Specifically, that means that the engines in the emission standards Tier 2, Tier 3 and Tier 4 have the same performance, the same parameters for the cooling system and the same interfaces for installation. That enables customers to substantially simplify their machine design by allowing engines with different emission standards to be exchanged in the same machine. That is an important advantage for any equipment that is used all around the world.

### **Number of advantages**

Around the globe, an increasing number of ports are focussing on environmental issues. Not least because of environmental restrictions, ports are steadily improving their eco-credentials. The new Liebherr stage IV / Tier 4 final diesel engines combine a number of advantages. Customers will benefit from less fuel consumption, less energy for engine cooling and less exhaust backpressure, which preserves the engine components.

Beside these potential savings, also maintenance is very simple and cost-efficient. No periodical cleaning of the diesel particle filter is needed. The motor oil is much less contaminated by soot which leads to longer service-intervals.

## **Commitment to research and development**

Substantial investments into research and development are indispensable for continuous innovation in terms of environment-friendliness and efficiency. For that reason, the Liebherr Group invests constantly in new innovative technologies that are efficient and green at the same time. Liebherr's technical design department is continuously developing new solutions for low-emission drive technology in order to make cargo handling more eco-friendly.

### **Caption**

File: 12-cylinder-diesel-engine.jpg

The new 12-cylinder Liebherr stage IV / Tier 4 final diesel engine

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