

### **Liebherr presents its component solutions for construction machinery at CTT 2016**

- Engines and injection systems from Liebherr
- Reman plant in Nizhni Novgorod: Remanufacturing of components in three stages: exchange components, general overhaul and repair
- Resource-conserving procedure: compared with the production of new components, there is an average energy saving of 70%, if remanufacturing is chosen; and up to 75%, if the existing material can be re-used.

**Moscow (Russia), 31 May 2016 – Liebherr showcases its component solutions at the international construction machinery trade fair CTT 2016. The focus here is on the development and manufacture of diesel and gas engines, as well as on the remanufacturing of used components for construction machines. The Liebherr Reman programme includes three customised remanufacturing levels. Customers are, thus, given the right solution for every need.**

The components division of the Liebherr Group offers a wide range of solutions in the area of mechanical, hydraulic, electrical and electronic drive and control technology. At CTT, Liebherr mainly presents its competence in the area of the development and manufacture of diesel and gas engines, as well as the remanufacturing of components. This is demonstrated at the exhibition stand on the example of a V12 diesel engine.

Liebherr is able to rely on its many years of experience in the development and production of diesel and gas engines. Currently, the product portfolio of standard diesel engines comprises six different basic engines ranging in performance from 130 kW to 750 kW. From the 4-cylinder and 6-cylinder in-line engines to the 8-cylinder and 12-cylinder V-engines, a broad performance and torque spectrum is covered. Other engines, which extend the portfolio upwards, are currently being developed. At this year's Bauma in Munich Liebherr presented with the D96XX and D98XX two new diesel V-engine series in the upper power-output category from 700 kW to 4,500 kW . The two new engine generations will go into production from the end of 2016. Based on the D9620 diesel engine, Liebherr is also developing a gas engine for stationary applications with a power output of 1070 kW. The mobile gas engine G946 λ1 mobile

for applications in the heavy-duty area is another innovation, which further expands the current gas engine portfolio. The G946  $\lambda$ 1 mobile is designed for performances of 330 kW at 2000 rpm. The engines and the respective components, such as the injection system and engine control unit, are manufactured at Liebherr's own production sites in Colmar (France) and Bulle (Switzerland). Thanks to the high level of vertical integration, all components are perfectly matched to each other. An example of this is the second generation of the common rail system 11.2, which is designed in a new installation version as a top feed system. This makes other options for the positioning of the rail, as well as of the pressure lines possible, thus offering the customer more flexibility for the system integration.

### **Remanufacturing for economical use of resources**

It is more than ten years since Liebherr has developed a component remanufacturing programme ("Reman" for short). The Liebherr Reman Competence Centre is located in Ettlingen (Germany). There, used components from Liebherr construction and material handling machines, mining equipment, mobile cranes and maritime cranes are reconditioned. Other versions of the Reman programme are suited to local needs and are available at various Liebherr locations throughout the world. For the Russian market remanufacturing of components began in Nizhni Novgorod in February 2016.

Depending on machine type, age, residual value and the possible period out of use, customers are able to choose between an as-new exchange component, a general overhaul or a component repair. Compared with the production of new components, there is an average energy saving of 70%, if remanufacturing is chosen; and up to 75%, if the existing material can be re-used. This avoids unnecessary consumption of valuable resources and significantly reduces the environmental impact.

### **New Reman plant in Nizhni Novgorod, Russia**

The new Reman centre in Nizhni Novgorod, Russia, began operations in February 2015. The processes at the new Reman plant are closely orientated to the proven procedures practised in Ettlingen and are optimised by relevant training.

Liebherr is planning to establish further Reman plants around the world on the model of the European Reman Competence Centre in Ettlingen. This should reduce the long transportation distances and ease the burden of import requirements. A network of regional operations will improve closeness to the customer and support business in new machines.

### **Exchange components**

If the the exchange component is chosen, the customer returns the used component and is supplied with one that complies with the latest technical standards, has been manufactured to new-product quality standards and carries the same warranty. If a preventive ordering policy is pursued, the machine is out of action for less than 24 hours, since the used item is not removed until the exchange component arrives. This level is recommended, if the machine's residual value is still high and whenever machine shutdown will involve very high costs. Customers receive an attractive payment for the used component. They are informed in advance of the fixed price for the exchange item and the sum credited to them for the returned component, and can, thus, calculate the cost of the maintenance work.

After return to Liebherr, the used component is completely dismantled. Wear parts are discarded; those that can be re-used have their paint finish removed and are cleaned and assessed according to strict standards. Machine tolerance measurements and crack testing determine, whether the parts are suitable for remanufacturing. If so, they are restored to as-new quality by industrial machining and processing methods. They then undergo final inspection, using the same test procedure as for new components. Every remanufactured exchange component complies with the manufacturer's standards for new parts.

### **General overhaul**

In contrast to the exchange procedure, a general overhaul is carried out on the actual component returned by the customer. Components are stripped down completely and cleaned. All parts subject to wear are replaced, together with any that have been damaged. The component is then re-assembled to the same technical standard as

before, repainted, inspected to the manufacturer's original standard and returned with a new part warranty.

## **Repair**

If this level of remanufacturing is chosen, the damaged parts in the component are identified first, after which it is repaired to professional standard. Before return to the customer, it is inspected in accordance with the manufacturer's test criteria and a warranty on the entire component is issued.

## **Captions**

liebherr-reman-v12-engine.jpg

Liebherr V12 diesel engine after general overhaul.

liebherr-reman-dieselprüfstand.jpg

Diesel engine test bench at the Liebherr Reman Centre in Ettlingen. Before they are delivered, all components are tested using the same test procedures as for new components, and have the same warranty cover, accordingly.

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