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Press Release

Schaeffler at bauma 2025 (Hall 6, Booth 103)

Reducing the energy consumption of construction machinery with low-friction roller bearings

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- Reduction of energy requirements and emissions of construction machinery by means of low-friction roller bearings in drivetrains and hydraulic pumps
- Friction reduced thanks to optimized rib contact and surface structures
- Energy-efficient optimization of bearing interior geometry for use in a wheel loader

By their very nature, rolling bearings are particularly low friction. However, in cylindrical and tapered roller bearings, there are sliding contacts that cause a high percentage of their frictional torque. Schaeffler's development engineers have now been able to substantially reduce this proportion even more through targeted optimization measures.

Low-friction cylindrical roller bearings

There are various applications for cylindrical roller bearings in construction machinery. Accordingly, cylindrical roller bearings can be ideal for use in integrated planetary gear bearing arrangements. Here especially, they offer a major advantage in applications with minimal installation space and high radial load, and thanks to reduced friction can have a direct impact on the necessary energy consumption and thus the emissions of construction machinery.

Moreover, cylindrical roller bearings can substantially reduce the energy consumption of hydraulic pumps. Schaeffler engineers presented a use case where low-friction cylindrical and tapered roller bearings were used in the hydraulic system of a 140 kW wheel loader. The result in this case is that up to 9 kW can be saved by using X-life components and bearings with a hydraulic pump optimized in this way and two hydraulic motors. In the case of a fleet of 1,000 wheel loaders with normal operating times, 16,000 metric tons of CO2 can be saved a year.

Low-friction tapered roller bearings

Whereas conventional tapered roller bearings are already low friction, tapered roller bearings in X-life quality offer an additional increase in energy efficiency and load capacity. The rib contacts of the tapered roller bearings were optimized, while the surface structure, dimensional and running accuracy and material quality

were substantially improved. The result is an increase in dynamic load ratings by up to 25 percent, which is associated with a doubling of service life. At the same, the frictional torque is reduced by up to 75 percent, compared with conventional products. These improvements also result in a significant reduction in the noise of the tapered roller bearings. In addition, targeted measures like an application-specific optimized internal geometry achieve reductions in friction that surpass the X-life quality.

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Schaeffler Group – We pioneer motion: The Schaeffler Group has been driving forward groundbreaking inventions and developments in the field of motion technology for 80 years. With innovative technologies, products, and services for electric mobility, chassis solutions, and renewable energies, the company is a reliable partner for making motion more efficient, intelligent, and sustainable – over the entire life cycle. Schaeffler describes its comprehensive range of products and services by means of eight product families: from bearing solutions and all types of linear guidance systems through to repair and monitoring services. With around 110,000 employees and more than 250 locations in 55 countries, Schaeffler is one of the world's largest family-owned companies and ranks among Germany's most innovative companies.

Extreme friction reduction with internal geometry of the tapered roller bearing optimized to suit the application Image: Schaeffler

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Tapered roller bearing in X-life quality now with higher load rating Image: Schaeffler

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