

Press Release

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Knorr-Bremse and tedrive Steering integrate active steering in commercial vehicles with the braking system

Through its recent acquisition of tedrive Steering Systems GmbH, Knorr-Bremse has added innovative steering technologies for commercial vehicles to its product portfolio and paved the way to offering an integrated longitudinal and lateral guidance system for automated driving in heavy-duty commercial vehicles.

tedrive Steering Systems GmbH is a manufacturer and development partner for steering systems for all axle loads. tedrive's base recirculating ball steering gears are suitable for vehicles with front axle loads between 2.5 and 9 tons. One key product is tedrive's iHSA[®] (intelligent Hydraulic Steering Assist) technology. Automated driving predicates control of the longitudinal and lateral vehicle dynamics independent of driver input. Today, Knorr-Bremse's electronic brake control systems can already control the longitudinal motion of the vehicle and at the same time ensure its dynamic stability. Integration of iHSA steering will mean that the system can now also control the vehicle's lateral dynamics. Knorr-Bremse is thereby putting in place one of the key prerequisites for implementation of automated driving in the commercial vehicle sector.

Steering systems for all axle loads

In the recirculating ball steering segment, tedrive Steering has three basic systems in its portfolio – C300, C500 and C700 – suitable for vehicles with front-axle loads from 2.5 tons (C300) to 9 tons (C700). The specifications of the iHSA control module are identical for all tedrive recirculating ball steering gears.

The robust, modular design of the recirculating ball steering gears, as well as their high hydraulic power-to-weight ratios and compact dimensions make for maximum flexibility in terms of applications engineering. The recirculating ball steering gears are also available in a two-circuit version and for two-axle systems as a master/slave application. The company also develops and delivers special applications for very high axle loads. When developing its commercial vehicle steering systems, tedrive Steering applies a balanced blend of proven and innovative technology.

System integration for safe and efficient mobility on the roads

"In our very first joint projects, connecting up the brake control system from Knorr-Bremse and iHSA technology to form a control network rapidly revealed the benefits of genuine system integration," said Bernd Spies, Chairman of the Management Board of Knorr-Bremse Systeme für Nutzfahrzeuge GmbH. "Driver assistance and automated driving functions can be channeled through a common interface, and then optimally synchronized between the steering and braking systems. Added to which, the more advanced levels of automated driving require a back-up function for the steering, and this can be provided efficiently by the brakes."

With tedrive Steering's intelligent Hydraulic Steering Assist technology, Knorr-Bremse will be able to realize numerous optimized solutions for driver assistance systems and automated driving functions. By adding the patented iHSA control module to a tedrive base recirculating ball steering gear, all safety-related and comfort & convenience functions, such

as congestion assist, platooning (driving in convoy with short distances between vehicles) or autonomous yard maneuvering, can be implemented in heavy-duty commercial vehicles.

Knorr-Bremse's aim is to generate added value for its customers, be they vehicle manufacturers or operators, in the development, production and operation of commercial vehicles. In the interests of greater safety and of reducing vehicle and operating costs, Knorr-Bremse has been systematically pursuing this course for many years now, particularly against the backdrop of the growing market penetration of driver assistance and automation functions.

How does the iHSA steering module work?

The iHSA steering module combines the familiar advantages of electric steering – the possibility of driver-independent torque overlay – with those of conventional hydraulic steering gear, while also presenting a robust overall design suitable for use in light commercial vehicles, heavy-duty trucks, buses and special-purpose vehicles with high front-axle loads.

In conventional steering systems, the steering torque initiated by driver controls the hydraulic power steering via a hydraulic valve. The iHSA steering system uses the existing hydraulic valve as well, but also addresses it, independent of driver input, via a compact electric motor, thus generating steering torque independently of the driver. The motor can be kept very small because it doesn't have to deliver any steering torque itself but simply serves to control the hydraulic valve.

As a result, the power uptake of the iHSA control module is low and there is no need to modify the vehicle's electrical system. The steering system can be controlled by the driver assistance systems in conjunction with the steering torque applied by the driver. In highly automated driving functions, this can take place without driver involvement.

Along with its base recirculating ball steering gears, tedrive Steering is an established manufacturer of rack-and-pinion systems for passenger cars. The company for many years now has also been supplying these for LCV applications with higher axle loads. As a key differentiator and USP here, tedrive Steering offers proprietary steel housing technology that delivers tangible benefits in terms of steering feel.

Caption: With the intelligent steering system iHSA®, Knorr-Bremse is now paving the way for automated driving. | © tedrive/Knorr-Bremse

Knorr-Bremse is the world's leading manufacturer of braking systems for rail and commercial vehicles, with sales totaling almost €6 billion in 2015. In 30 countries, some 25,000 employees develop, manufacture, and service braking, entrance, control, and energy supply systems, HVAC and driver assistance systems, as well as powertrain and transmission control solutions. As a technology leader, for more than 110 years now, through its products the company has been making a decisive contribution to greater safety by road and rail. Every day, more than one billion people around the world put their trust in systems made by Knorr-Bremse.

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