

Press release

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Digital, networked and automated: Knorr-Bremse is presenting groundbreaking solutions for the commercial vehicle of the future at the IAA 2016 in Hanover

New types of driver assistance systems and automated driving functions will be the central focus of Knorr-Bremse's display at this leading trade fair. The global market and technology leader will be showcasing specific solutions for safe and efficient mobility on the roads with innovative, intelligently networked braking, steering and powertrain systems.

Under the motto "Creative Systems – Globally", visitors to booth A30 in Hall 17 and the "New Mobility World LIVE" open air demonstration area will find an extended portfolio of products from Knorr-Bremse that represents a convincing response to the increased automation and networking of transport and logistics operations.

"A central theme of the IAA will be the new scope offered by automated driving and telematics. After many years in which markets have been dominated by a focus on safety and fuel efficiency, new areas are now driving innovation in the sector. This is where our systems competence puts us at an advantage – as can be seen from our new blind-spot assistant and, above all, a system that enables a truck to drive autonomously off-highway. Our message is clear: We are going to play an active part in preparing the ground for fully automated driving," says Dr. Peter Laier, Executive Board Member of Knorr-Bremse AG responsible for the Commercial Vehicle Systems division.

With the recent addition of state-of-the-art steering systems from tedrive to its portfolio, Knorr-Bremse has not only gained access to new markets but has also acquired the capability of actively influencing lateral as well as longitudinal truck dynamics – for example in order to keep a truck automatically in lane or help it steer round a hazard. iHSA® technology (intelligent Hydraulic Steering Assist) plays a crucial role – an electronically-controlled hydraulic steering system developed specially for automated trucks.

Knorr-Bremse will also be showcasing the next generation of disc brakes for heavy-duty trucks and the modular, scalable GSBC brake control system for world-wide use. Other areas the company will focus on at the IAA include powertrain and trailer innovations and the launch of the new TruckServices aftermarket brand.

Safety and efficiency in the fleet depot: autonomous yard maneuvering

Knorr-Bremse knows more about the complex geometry and dynamics of truck/trailer combinations than any of its competitors. Drawing on its experience with the hundreds of thousands of its driver assistance systems already in the market – ABS, ESP, active cruise control, lane departure warning and emergency braking systems – the company will be using a fully-automated truck at the IAA to demonstrate how off-highway loading and unloading operations can be carried out more safely and efficiently.

The semitrailer automatically drives to its bay to load or unload its consignment of freight. With the help of its environment detection system and the data from various sensors, combined with intelligently networked brake, drive and steering control systems, it deftly ma-

neuers to and from the loading bay, automatically stopping if danger is detected. The advantage is that there is less danger of minor damage being caused during complex maneuvering, and no time is lost because of errors in bay selection. The driver's time behind the wheel is also shortened, enabling him to take his statutory rest hours or carry out other tasks. Once autonomous yard maneuvering has begun, a smartphone app keeps him informed of the loading/unloading process, and he only has to return to the cab when the truck is ready to leave the depot.

Reducing risk: Blind spot assistant makes intersections safer

Knorr-Bremse's new blind spot assistant for trucks was developed with a view to significantly reducing the number of accidents at urban intersections. Trucks turning right (or left) in urban traffic represent a serious risk for cyclists and pedestrians. Despite his truck having several external mirrors, the driver's high seating position means he may have difficulty seeing other road users close to the side of his vehicle. With its combination of camera and radar surveillance of the vehicle's nearside, the Knorr-Bremse blind spot assistant can reduce the risk in such situations, detecting other road users and alerting the driver to their presence.

Modular and scalable: the new GSBC brake control system

Driver assistance systems and automated driving functions call for intelligent interaction between all the systems in the vehicle – and as the central safety-critical element, the brake control system plays a crucial role. Knorr-Bremse's newly-developed global scalable brake control (GSBC) is a highly integrated system that is scalable according to individual customers' requirements. It offers an ideal platform for developing the next stages of driver assistance and automated driving systems. Integration of acceleration and yaw sensors enables cost savings to be made by installing the system on the vehicle chassis.

A completely new system architecture significantly reduces the number of components in the GSBC system, saving installation space and weight and cutting installation costs for the manufacturer by doing away with components, pipes, brackets and pneumatic adapters. Improved, self-adapting software and pre-defined parameter sets reduce manufacturers' application costs for different vehicle variants. The software is scalable from a simple ABS function to complex EBS applications, so customers' development costs are also reduced. Operators and repair shops benefit from shorter repair and maintenance times as a result of the modular design and the additional diagnostic functions.

Premium performance: the upcoming generation of disc brakes for heavy duty trucks

Knorr-Bremse disc brakes are unrivalled in terms of their precise response to commands from the brake control system. Drawing on their experience of supplying 32 million disc brakes world-wide for buses, trucks and trailers, the Knorr-Bremse engineers have now developed a new generation of disc brakes that will be officially christened at the 2016 IAA: Synact. With a new, topologically improved design of brake caliper and backing plate, an innovative structure for the internal mechanics and a better combination of materials, Synact takes braking to a new level of performance: Braking torque has been increased by eleven per cent compared with the current volume-produced SN7 brake, and at the same time the weight has been reduced by some ten per cent. Installing the Synact in a 4x2 semitrailer cuts the overall weight by 16 kilograms – and this saving almost doubles if a complete Knorr-Bremse wheelend with the new, second generation flat SD disc is used.

Further reductions in the total cost of ownership have also been achieved: A new adjustment mechanism ensures a clearance margin within a narrow tolerance band throughout the entire life of the brake, reducing pad wear and residual braking torque and bringing significant cost savings for the operator. This solution also allows for later steps to mechatronize the adjustment function. The brake's modular design enables customers to individually

configure 'their' disc brake from an extended catalog of available functions. Synact is also configured to accept new sensors and actuators required for additional automated driving or condition-based maintenance functions.

Pneumatic perfection: Innovative air supply systems

Heavy duty trucks use compressed air to control a variety of different functions: tractor and trailer brakes, clutch, gearbox, lift axle and the pneumatic suspension for the axles and driver's seat. Knorr-Bremse supplies fully-integrated, intelligent air treatment and supply systems that offer a combination of absolute reliability, durability and, above all, maximum efficiency. Several years ago, the company launched volume production of a number of fuel-saving innovations such as the compressor with clutch and the EAC electronic air treatment system. For commercial vehicles with hybrid or electric motors, Knorr-Bremse's portfolio contains electric compressors that combine maximum efficiency with minimal noise emissions and are able to utilize braking energy to generate compressed air.

In the case of air treatment, Knorr-Bremse has long been the undisputed market and technology leader. The company's EAC electronic air treatment system has been a hit for the last 13 years, with more than a million units produced and supplied to customers. This 'heart' of the pneumatic system has recently had a number of additional functions added – including an integrated electronic parking brake that has aroused considerable interest among vehicle builders and earned plaudits from truck drivers for safety and comfort. Elimination of the pneumatic handbrake valve, piping and fittings has given vehicle manufacturers greater freedom to design the cockpit and at the same time has saved weight and costs.

Consistent quality: The latest powertrain developments

Knorr-Bremse is the go-to supplier for manufacturers wishing to reduce emission levels and make their powertrain systems more reliable and efficient. One example is Knorr-Bremse's mechatronic transmission management system, which last year went into volume production for a leading automotive supplier's automated gearshift. Amongst other advantages the system – an electronic control module combined with pneumatic and sensor modules integrated into the transmission – helps reduce servicing costs. The shift module for the world's first dual clutch transmission for heavy duty trucks has been in volume production since 2014. Fully automatic gear shifting is easier and faster and does not involve any interruption in tractive power, enabling higher average speeds to be maintained.

At the 2016 IAA, Knorr-Bremse is presenting for the first time a retrofittable, integrated AMT control module for manual shifts that has been specially developed for the needs of emerging markets such as China. Observers of these markets, where manual gear shift units are still the norm, are expecting a significant increase in demand for automated manual transmissions because of the advantages these offer in terms of fuel consumption, component wear and driving safety. The planned acquisition of Bosch Japan's transmission component business for on-highway trucks will further strengthen Knorr-Bremse's competitive position, especially in the field of AMT and DCT transmissions in Asia. On display in Hanover for the first time is Knorr-Bremse's long-life clutch servo. This new model is capable of four million cycles – twice as many as comparable products in the market – and ensures reliable operation of the truck under all ambient conditions.

The vast majority of commercial vehicles – trucks and buses – are powered by diesel engines, and will continue to be for the foreseeable future, as they are currently unrivalled in terms of reliability, range and efficiency. This makes it all the more important for diesel engines to be further refined to enhance their fuel efficiency and reduce their emissions. Here, too, Knorr-Bremse's product portfolio can make an important contribution – not least since the company acquired GT Emissions Systems, an acknowledged specialist in exhaust gas

recirculation valves and exhaust brakes. The British company's products and expertise, for example in the field of mechatronic exhaust valves, will combine with Knorr-Bremse's global development, production and marketing presence to offer a new quality of collaboration with OEMs aimed at further improving the sustainability of road freight operations.

Innovations for trailers: iTAP keeps control

Stockholm, San Francisco or São Paulo – everywhere in the world Knorr-Bremse ensures the safety and efficiency of trailers with a global program of brake and chassis control systems that cater for a wide range of requirements. In Europe, the company has been continuously developing its TEBS G2.2 electronic trailer braking system, with the latest innovation being iLvl (Intelligent Levelling Control) with pneumatic backup. iLvl operates without the traditional pneumatic control system, making it easier for vehicle builders to install, and offering the driver additional advantages such as the ability to pre-program ramp heights for automated maneuvering.

With the Intelligent Trailer Access Point (iTAP) Knorr-Bremse has created an additional user interface and electronic display offering trailer manufacturers and operators further groundbreaking options in terms of safety, efficiency and driver convenience. The system gathers data such as tire temperature, tire pressure, odometer readings, braking processes and error messages and displays them on the driver's smartphone. It also enables functions like the electronic air suspension to be wirelessly controlled from the driver's cab or at a safe distance from the trailer.

A new addition in combination with iTAP is a cableless system that uses chassis-mounted video cameras to enable the driver to check the cargo space or the area to the rear of the vehicle. Whatever the particular tractor vehicle and without the need for any cabling, the driver can check whether his dump truck has completely emptied or there is any obstacle behind the vehicle. The ST7 trailer disc brake from Knorr-Bremse was first launched at the IAA in 2014. Since then, this ultra-light two-piston brake for 22.5-inch wheels has proved popular with customers, with more than 300,000 units already supplied and proven in service.

At this year's IAA Knorr-Bremse will be continuing this success story and introducing the ST7s 'kid brother' – the ST6 for 19.5" applications. Weighing in at a mere 32 kilograms and offering maximum braking torque of 19.3 kNm, this two-piston disc brake has the same design advantages as the ST7, such as encapsulated floating and fixed bearings. The use of the same guide rods and seals means that Knorr-Bremse can offer identical aftermarket kits for both ST6 and ST7.

Redefining lifetime efficiency: Knorr-Bremse TruckServices

Shortly before the IAA opens its doors, Knorr-Bremse will be celebrating the world premiere of its new TruckServices aftermarket brand: At the automechanika 2016 trade fair in Frankfurt (13.-17.09.2016) TruckServices will be presenting its expanded service portfolio for dealerships, repair shops fleet operators and drivers. In line with its motto: 'Keep it running', TruckServices will be offering safe, economical solutions for repairing and maintaining buses, trucks and trailers of all types and ages.

The services on offer range from new parts and a growing selection of remanufactured products right down to premium quality repair kits – all accompanied by technical training, advice and much more. It goes without saying that at the 2016 IAA the TruckServices specialists from Knorr-Bremse will be introducing visitors to the same innovations as at automechanika.

Caption 1: The 'transparent' truck. Knorr-Bremse's extended systems portfolio offers convincing responses to the increased automation and networking of transport and logistics operations.

Caption 2: "After many years in which markets have been dominated by a focus on safety and fuel efficiency, new areas are now driving innovation in the sector. We are going to play an active part in preparing the ground for fully automated driving," says Dr. Peter Laier, Executive Board Member of Knorr-Bremse AG responsible for the Commercial Vehicle Systems division.

Caption 3: The Intelligent Trailer Access Point (iTAP) is an electronic display and control system developed by Knorr-Bremse that offers a wide range of functions to manufacturers and trailer operators.

Note for editorial staff: The Knorr-Bremse press conference at the 2016 IAA will take place on September 21 from 13.30 to 14.00 in Hall 17, Booth A30. We look forward to welcoming you!

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 over 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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