Special edition

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DAS TRUCK-MAGAZIN FÜR BERUFSKRAFTFAHRER

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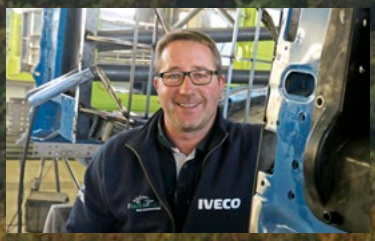
DIE ZEITUNG FÜR TRANSPORT, LOGISTIK UND MANAGEMENT

Automated driving

Knorr-Bremse and the truck of the future



Truck Race
Jochen Hahn chooses Iveco for 2017

Telematics
Keeping the fleet under control: ProFleet Connect

KNORR-BREMSE Special

A fresh start with Iveco

Truck Racing: The 2017 season marks the start of a new chapter for Team Hahn Racing. The long-standing partnership with MAN has come to an end. From now on, Jochen Hahn will be driving an Iveco.

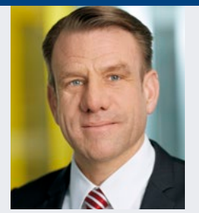
The team is rebuilding the Iveco race truck from scratch for the 2017 season.

Jochen Hahn's fourth European truck racing title elevated him to the pinnacle of his sport. Only Britain's five-time champion Steve Parrish has more triumphs under his belt. But despite winning all of his four titles with MAN, Jochen Hahn has followed Norbert Kiss's lead and become the second successive reigning champion to go over to the competition. According to the newly crowned champion, Iveco wasn't the only manufacturer to court the Altensteig-based team. But it was the Ulm-based truck manufacturers who came up with the best package – not least thanks to Georg Glöckler's Team Schwabentruck which is developing its race truck technology in full cooperation with Hahn Racing in Ulm and the Black Forest. "We have a very close friendship with Schorsch Glöckler," says Jochen Hahn. "He built up the team from almost nothing, so he brings a huge amount of know-how to the partnership. It's a win-win for both of us."

Despite the new vehicle partnership, it's business as usual as far as the team's sponsors are concerned. "Our sponsors are staying with us on our new journey," says a delighted Diana Hahn, who as well as being Jochen Hahn's wife is responsible for the team's marketing activities. The team maintains close contact with its sponsors to ensure the continuation of their long-standing partnerships. Knorr-Bremse has been a reliable partner for almost two decades and will be remaining on board after the change of manufacturer. After all, as Mrs. Hahn says, the Munich company supplies state-of-the-art technology for a range of different brands. Driver Jochen Hahn doesn't believe that the change of manufacturer will make much difference in the heat of the battle. "I don't care who the manufacturer is. I'll be taking the attack to the rest of the field in 2017, like I do every year." On the whole, he doesn't think that the Iveco race trucks perform any worse than the MANs out on the tarmac. Moreover, the teams are making good progress with the development of their new race trucks – Jochen Hahn will be lining up alongside Gerd Körber in the team championship.

We should have a clearer idea of just how good the new Iveco generation really is by the time of the first test drives in March and April. In any event, MAN had better get ready for a real battle. There have been few new seasons where the pack has been reshuffled as interestingly as in 2017.

Driver Jochen Hahn is just as comfortable using welding equipment as he is driving around Europe's racing circuits.



Bernd Spies,
Chairman of the Board of Management of
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH.

Dear reader,

A new era for trucks is dawning: Sophisticated driver assistance systems like Adaptive Cruise Control or Automatic Emergency Braking are making a professional driver's job easier and ensuring that commercial vehicles and their loads can operate safely on our roads.

Tomorrow's trucks

But the process of technological development is far from over. In the medium term we are moving towards even greater automation of driving functions. Complex interlinked systems are going to make it possible for a driver to hand over control of his vehicle to the on-board electronics for entire periods of time, only intervening in the case of an emergency. Knorr-Bremse's decades of experience in developing and applying brake control systems put the company in a strong position to develop these systems, even for highly complex truck-trailer combinations.

Knorr-Bremse's expertise in driver assistance systems and automated drive functions is unparalleled in the world – which is why we want to use this edition of Knorr-Bremse Special to introduce you to the exciting world of tomorrow's truck and demonstrate what is already technically possible.

The modular telematics system ProFleet Connect, which helps fleet operators boost their efficiency and cut costs, was developed by Knorr-Bremse TruckServices with tomorrow's world as well as today's in mind. Telematics are also helping freight companies improve the safety of their drivers and vehicles. This magazine describes the various elements in the system and the first reports from the professional drivers who have been testing it.

Truck Race European champion Jochen Hahn is currently poised to enter a new stage in his career. Many fans were surprised when he swapped his MAN vehicle for an Iveco truck, but, as our review of the new season shows, it is clear that he is determined to return to the winners' podium in 2017. As his main sponsor, Knorr-Bremse, is crossing its fingers for the man from the Black Forest!

We hope you enjoy reading this 2017 edition of Knorr-Bremse Special.

Best wishes

Bernd Spies

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IMPRINT

Editor Georg Weinand
Editorial team Markus Bauer, Volker Joksch
Translation by Hugh Keith & Kim Blasco
Graphic design Marcus Zimmer
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Here comes the future!

Automated driving: Digitalization and networking of vehicle components is paving the way for more and more smart driving functions and driver assistance systems. But their complexity is also increasing, together with the demands they make on safety and systems expertise. Knorr-Bremse has the necessary competence in this field.

The Automatic Emergency Braking System (AEBS) prevents rear-end collisions in tailbacks without driver intervention.

A range of different intelligent assistance systems is now available – and not just for passenger cars: They include the automatic emergency braking system (AEBS), which triggers emergency braking to avoid an imminent rear-end collision, the lane departure warning system (LDWS) which warns the driver if his vehicle starts to drift out of lane, and adaptive cruise control (ACC), which automatically maintains a safe distance from the vehicle in front.

Overall systems competence

All these systems rely on the interaction of a range of carefully matched components. Failure of an individual element can have fatal consequences. Knorr-Bremse has decades of experience in developing and supplying complex, safety-critical mechatronic systems for trucks – and the company even assumes responsibility for the entire system including the necessary hardware and software. Modern braking and transmission control systems already contain a significant electronic and software element, and Knorr-Bremse ensures that the many millions of units currently installed in vehicles perform reliably and safely.

Two axles versus five – different worlds

Does this mean that automated driving on autobahns will soon be available for heavy-duty trucks? It is unlikely that the types of highly-automated functions already available for top-of-the-range passenger cars will be found in trucks in the immediate future. “Handling a heavy-duty truck/trailer combo with five or more axles and at least one articulation point is a lot more complicated than for a normal two-axle passenger car,” says Jürgen Steinberger, responsible for automated driving in the Knorr-Bremse Commercial Vehicle Systems division. A truck’s center of gravity is higher, its load may well be unequally distributed, the trailer swings out during cornering, and during braking it can push the vehicle in various different directions depending

Tomorrow's world: The truck takes over control and the driver only intervenes in emergencies.

on the situation. All these factors will have to be taken into account for the automated trucks of the future to operate safely and without any malfunctions. And the much greater forces involved in controlling a 40 ton vehicle also have to be taken into consideration – the risks are entirely different to those for a much lighter passenger vehicle.

Knorr-Bremse controls vehicle dynamics

The Electronic Stability Program (ESP) already uses much of the information required for controlling such complex vehicle geometry. The product of more than two decades of experience and research, ESP applies the brakes on individual wheels to stabilize the vehicle if it is in danger of skidding or overturning – without intervening in the steering. The same principle of "steering by braking" is used by Knorr-Bremse for an advanced assistance system like Lane Departure Prevent (LDP), which prevents a truck from leaving its lane if the driver fails to react to warning signals. "Steering by braking" is also set to play an important role in highly automated driving – as a backup in the event of steering system failure.

Integrated steering and braking

To achieve an even higher level of automation, active steering is required. With its takeover of tedrive Steering Systems GmbH in 2016, Knorr-Bremse has added steering technology to its product portfolio, acquiring the necessary expertise for the Group and paving the way for a unique, integrated system of automatic control for longitudinal and lateral vehicle dynamics.

Knorr-Bremse uses the so-called "Transparent Truck" to illustrate its truck and trailer systems competence.

A truck that maneuvers independently

At last year's IAA Knorr-Bremse demonstrated what this might mean in practice. A truck in autonomous yard maneuvering mode can independently drive across a depot to the loading bay and back (see page 9). To do this, its environment detection system with its various radar sensors and video cameras, has to interact with the braking system and the transmission, engine and steering control. Added to these is a GPS navigation system and an exchange of data with the depot's management system. "Our pilot vehicle is already equipped with a highly sophisticated system capable of carrying out local maneuvering safely, precisely and cost-effectively," says Dr. Steinberger.

Communicating with each another

"Mind you, digital networking involves much more than just linking the components in an individual vehicle," says Steinberger. For automated platooning to be possible, for example, a radio link between the individual vehicles is needed to make sure they brake more or less simultaneously. This enables the safety gap between vehicles traveling at autobahn speeds to be reduced from the usual 50 meters to between 10m and 15m, thereby saving up to 10% of fuel. Knorr-Bremse has scheduled the first field testing of such a solution for 2017.

SAFER TURNING WITH NEW BLIND SPOT ASSISTANT

The Blind Spot Assistant enables the driver to check his blind spot by looking at a monitor mounted on the A-pillar of his cab that is linked to a video camera which checks the area to the side and rear of the vehicle. It is particularly valuable at intersections: If anything is blocking this area, the monitor switches to an aerial view and marks the image in yellow. If the vehicle's indicator has been activated or the system notices that the steering wheel is being turned, the image is even framed in red and an acoustic warning sounds. This considerably improves the driver's ability to assess the situation during turn-off.

Dr. Jürgen Steinberger: "We have unrivalled systems expertise."

Sit back and relax

Interview: In future, truck drivers will be offered much more support by their vehicles, according to Dr. Jürgen Steinberger, who is responsible for driver assistance systems and automated driving at Knorr-Bremse Commercial Vehicle Systems.

Mr. Steinberger, is automated driving a new field for Knorr-Bremse?

We have been developing a range of driver assistance systems for years. In the USA, for example, we are market leaders in Adaptive Cruise Control and Emergency Braking. And then there is the Electronic Stability Program (ESP), which is an important basic element in controlling the complex dynamics of a truck. We are building on this and drawing on our unrivaled expertise in complex, interlinked safety systems.

In other words, the company already has the required know-how?

Our core team for this area operates globally. At four of our longest-established sites we have been concentrating on developing system architecture, redundancy concepts, sensors, image recognition, algorithms and concept studies.

We are doing the work on the important software algorithms for the control systems ourselves, focusing on developing an integrated system for highly automated driving that enables the vehicle's lateral and longitudinal dynamics to be safely controlled. It has to function reliably even in critical driving situations or if individual components fail. In this context the steering technology and expertise that we acquired through our takeover of tedrive Steering Systems in 2016 is proving invaluable – and also our own knowledge of commercial vehicles' highly complex drive dynamics.

What is your ultimate aim?

At the moment, our systems provide the driver with support, but he is still always in control and has complete responsibility for the vehicle. The next stage – so-called highly-automated driving – will mean the driver can cede this control and responsibility to the vehicle itself for certain periods of time. However he will always have to be ready to take back control within the space of about 10 seconds.

The final step will involve trucks equipped with Knorr-Bremse systems operating without any driver at all. Last year our Autonomous Yard Maneuvering demonstration showed that this is possible. However it'll be more than a decade before we actually see trucks driving themselves on the open road and coping with the huge variety of different traffic situations that can arise.

Full speed ahead for automation

Autonomous Yard Maneuvering: It will be at least another decade before fully-automated heavy trucks driving along public roads become a reality. But at last year's IAA Commercial Vehicles, Knorr-Bremse demonstrated that it is already technically feasible.

Drivers will soon have to get used to the fact that when they park up their truck in a freight depot, it is not necessarily going to stand around and wait for them to come back. Knorr-Bremse's Autonomous Yard Maneuvering system enables the vehicle to drive independently to its loading ramp and back – safely, accurately and efficiently.

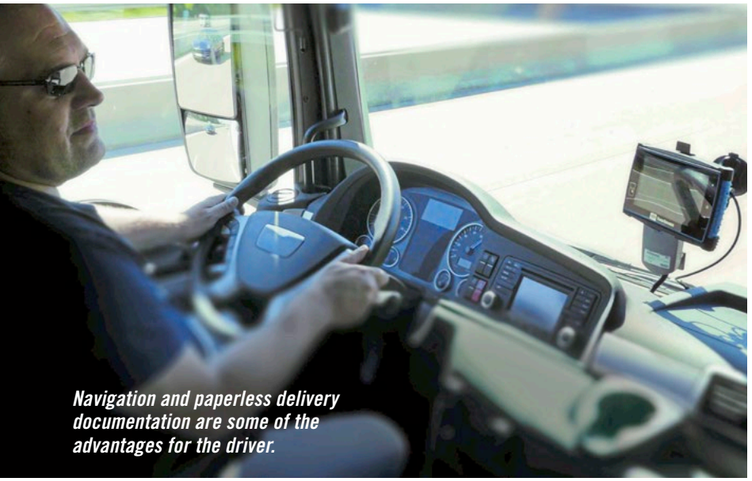
The driver triggers the process by contacting the depot management on his cell phone. Once the yard supervisor has been informed of the vehicle's arrival, he allocates it to a specific loading bay and gives the okay for it to start maneuvering. The system then drives the vehicle to the appropriate bay using a DGPS (Differential GPS) system to automatically keep it on the predefined route.

If this involves driving around a corner, the on-board computer uses the intelligent hydraulic steering assistance (iHSA) supplied by steering specialist KB-tedrive to turn the wheels at the appropriate angle. The system carries out the maneuver as often as required – and with unprecedented accuracy.

An array of radar sensors and video cameras around the entire vehicle constantly checks the surrounding environment for possible obstacles, stopping the vehicle if its designated route is blocked, and only allowing it to continue when the coast is clear.

Once loading or unloading has been completed and the supervisor has released the vehicle, it automatically returns to the handover point, where the driver can resume control.

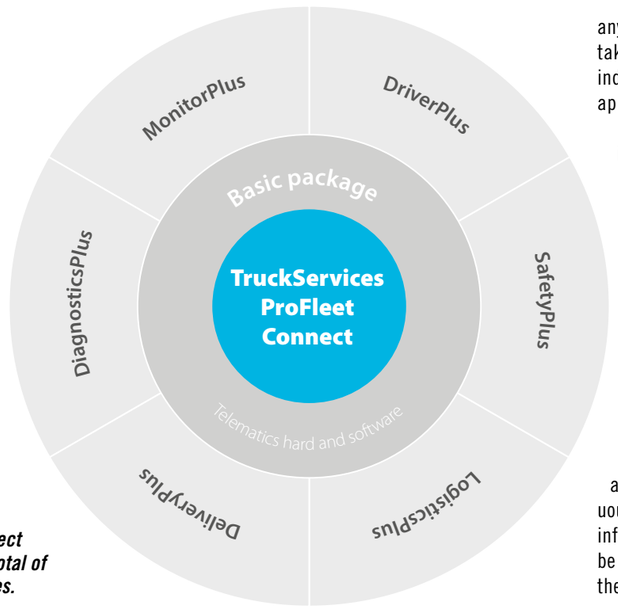
The semi-trailer drives itself to the correct loading bay.



Navigation and paperless delivery documentation are some of the advantages for the driver.

All from a single source

Telematics: Knorr-Bremse TruckServices is launching the modular 'ProFleet Connect' system, which helps logistics companies manage their fleets more efficiently.



ProFleet Connect consists of a total of seven packages.

Trucks or trailers – the ProFleet Connect telematics system provides continuous monitoring, supplying a stream of data to the operator to help him organize the shipping and distribution process more efficiently. That has certainly been the experience of German freight company Wenzl Güterverkehr in Aicha vorm Wald, which has been successfully testing the latest telematics system developed by the new Knorr-Bremse TruckServices brand (see box) for the past eight months.

"ProFleet Connect has helped improve our working processes and at the same time has provided an ideal basis for developing further training courses for our drivers," says Detlef Wenzl, proprietor of Wenzl Güterverkehr.

ProFleet Connect consists of a total of seven modules that provide support for order-processing, route, driver and vehicle management. The basic package enables freight operators to locate their fleet at any time and identify the routes individual trucks are taking. The system also supplies data for assessing individual drivers' efficiency and safety and designing appropriate training measures for them.

The purpose of the 'Driver-Plus' module is to improve communication between the driver and the depot. Navigational functions specific to individual telephones and vehicles automatically take into account the most important order-related data. At the same time, DriverPlus supports the downloading of data from the digital tachograph.

'SafetyPlus' and 'DiagnosticsPlus' are two additional features of the telematics system that use the data stream from the tractor unit. SafetyPlus instantly reports on unusual events such as emergency braking and stores all the driving data covering a period of 30 seconds before and after any incident. And DiagnosticsPlus continuously monitors the vehicle's operation, generating information that enables maintenance requirements to be immediately identified, avoiding long downtimes in the workshop.

For trailer units, TruckServices offers 'MonitorPlus', a telematics system that supplies all the necessary trailer-related information to the back office. It is a solution that is particularly valuable for refrigerated freight transportation, as it supplies all the relevant data for documenting the refrigeration chain. At the same time it records tire pressure and door opening, and sounds alarms if there is any deviation from the relevant settings.

Finally, ProFleet Connect offers two important features that can help freight companies improve their customer service: 'LogisticsPlus' and 'DeliveryPlus'. LogisticsPlus enables deliveries to be monitored in real time, communicating directly with the customer's administration software if necessary. And DeliveryPlus ensures complete documentation, even offering the driver the option of paperless processing of delivery documentation using a tablet. Pictures of damaged goods can be taken with the tablet, and the customer confirms receipt with his signature on the screen.

For logistics company Wenzl Güterverkehr, ProFleet Connect has been a resounding success, and the company plans to equip more of its vehicles when the system is rolled out in the second quarter of the year.

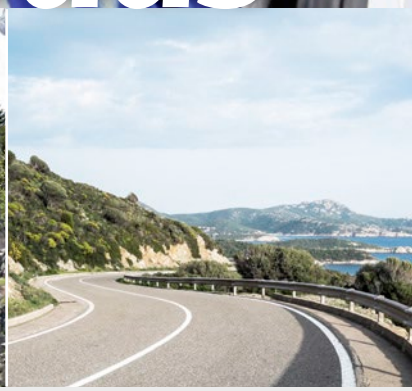
TRUCKSERVICES

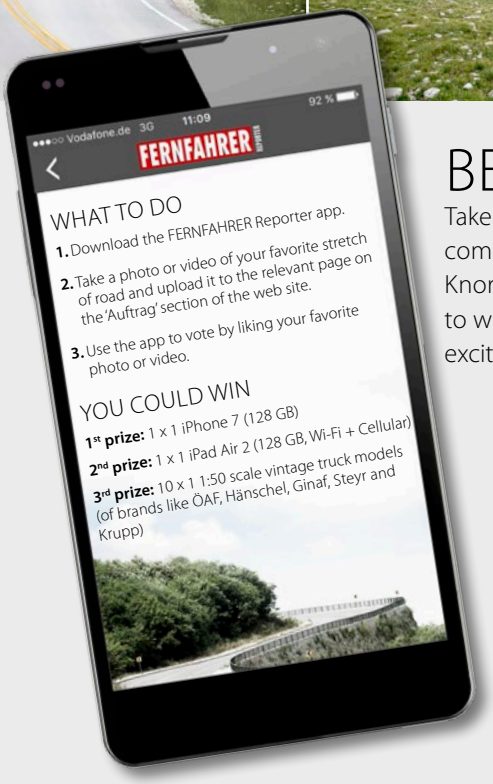
Knorr-Bremse's new TruckServices brand bundles the company's entire range of aftermarket services. With its expanded portfolio it can offer reliable, economical diagnostics, maintenance and repair for any vehicle, irrespective of age or make.

Under the slogan of 'Keep it running' TruckServices offers a comprehensive aftermarket package for commercial vehicles of all types and ages aimed at keeping them operating reliably and economically throughout their entire working life. Distributors, workshops and fleet managers benefit from diagnostics and needs-based maintenance and repair services, plus access to Knorr-Bremse's extensive expertise via online services, training and individual specialized advice. The company's efficient global logistics system ensures that spare parts in Knorr-Bremse's aftermarket portfolio are rapidly available, whenever and wherever they are required.

CLOSING DATE: 10.04.2017

Wanted: Your favorite roads





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Take your place on the grid for the new racing season, just like Jochen Hahn! Enter the photo competition we are running together with FERNFAHRER and you too can be a winner with Knorr-Bremse, even before the stars of the race track take the checkered flag. For a chance to win one of our amazing prizes, send us a photo or video of your most spectacular and exciting stretches of road. More information at **www.fernfahrer.de/lieblingsstrecken.**

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