BREMSPUNKT

AUTOMECHANIKA AND IAA Knorr-Bremse's exhibits at the leading trade fairs

TRUCK RACE Lukas Hahn conquers the Nürburgring

RESSENIG FAHRZEUGBAU

Forestry experts

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EDITORIAL









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Dear Reader,

Two of the leading trade fairs for the commercial vehicle industry will shortly be getting underway: Automechanika in Frankfurt am Main, and IAA Transportation in Hanover. We are really looking forward to seeing you again in person, and are currently making our final preparations to make sure your visit is as informative as possible. The commercial vehicle sector is going through an era-defining transformation, and we are determined to work with you to find out how we can support you even better as you tackle your day-to-day challenges.

Analog products and applications are being adapted to a digitalized world. The megatrends of road safety, autonomous vehicles, e-mobility, connectivity and sustainability are setting the direction for research and development, and are already making their presence felt in the aftermarket – as is demonstrated by our EconX® products or our retrofittable turning assistance system ProFleet Assist⁺.

At our booths, we will be aiming to show you exactly what the impending changes in our industry mean in practice, and give you a fascinating glimpse of our latest products - products that reflect our vision for the future of the commercial vehicle sector. Using state-of-the-art digital equipment, we will offer you a virtual journey through our product range in Frankfurt and Hanover. Numerous experts will also be on hand to talk to you face-to-face.

Beyond the world of the trade fair, we are still in a state of shock at the events unfolding in Ukraine. In this edition, we want to introduce you to Mustafa Celik from Celik Logistik - a man who decided to take matters into his own hands and set up a charitable initiative to help the people of Ukraine. He is about to embark on his third trip to the country, delivering two truckloads of aid to those in need.

One of his two trailers has been designed to be as aerodynamic as possible, and another of the articles in this issue sheds light on how aerodynamic improvements can help reduce fleet running costs in the medium term.

We conclude this issue with a customer feature on Austrian trailer and semi-trailer manufacturer Ressenig. The long-established family firm focuses on the forestry industry, for which it produces no fewer than 21 different high-quality vehicles. When it comes to braking systems, it has been relying on Knorr-Bremse for years.

I hope you enjoy reading this trade fair issue of Bremspunkt!

Alexander Wagner



ALEXANDER WAGNER, Head of Aftermarket/TruckServices EMEA at Knorr-Bremse Commercial Vehicle Systems

Streamlining to cut costs

Tests by Spedition Walter Schmidt and Vion Food Group show that investing in making trucks and trailers more aerodynamic can pay off in the medium term.





THE REAR WING SYSTEM on Vion's truck opens automatically at 60 kph. Freight companies are under immense pressure from high energy and fuel costs. For many of them, soaring market prices are nothing less than an existential threat. But Germany's companies are not standing idly by. Responsible freight transporters have already been updating their fleets with the latest technology for a number of years. They are using telemetry to optimize their route planning, training their drivers, and implementing a range of textbook measures to save fuel, from making sure their tires are inflated to the right pressure and re-cutting their profiles in good time, to reducing their vehicles' maximum speed on long highway journeys.

Another way of saving fuel is to make traction units and trailers more aerodynamically efficient. After all, on relatively flat highways, up to 40 per cent of a vehicle's fuel consumption can be traced back to aerodynamics. Theoretically, if you can reduce a truck's drag coefficient (Cw) by 30 per cent, you immediately reduce diesel consumption by ten per cent.

In reality, though, only a few transport companies have so far looked at aerodynamics with a view to reducing their fuel consumption and CO2 emissions. One of them is Spedition Walter Schmidt, with its deputy managing director Daniel Sabelus. Based at Wildau, just outside Berlin, the firm employs 35 people and specializes in heavy, highvolume industrial haulage and temperature-controlled freight. It is currently carrying out a six-month test of two Schmitz Cargobull Ecoflex trailers, part of the manufacturer's "Ecogeneration" range. The rear sections of the trailers can be lowered by up to 50 centimeters if required, reducing the drag and air turbulence affecting the back of the trailer.

As Sabelus explains: "The aerodynamic rear end does more than just reduce CO2 emissions and fuel consumption. If we need more load area for high-volume shipments, we can easily pull the rear section up." The concept has the potential to deliver major savings, especially for heavy loads like steel products, without requiring significant changes to handling procedures.



THE UNDERBODY of the Vion trailer is covered with a highly-rigid membrane.

"Investing in aerodynamic trailers pays off in the medium term."

Daniel Sabelus, Deputy Manager of freight company Walter Schmidt



According to Sabelus, those savings could amount to as much as 1.5 liters of diesel per 100 km or more. "The upfront additional cost is several thousand euros, but we recoup that money within four to six years at most." Given that Walter Schmidt's trailers usually spend eight to ten years on the roads, the investment definitely pays off in the medium term.

The international food company Vion Food Group, which is headquartered in the Dutch town of Boxtel and operates production plants in Germany and Benelux, is taking a different approach in a determined effort to reduce harmful emissions from its logistics operations, including launching its "Vion Moves Food Green" project.



THE FRONT WING SYSTEM makes the roof area between the traction unit and the trailer less susceptible to turbulence.

The project was set up by Katharina Schweiger, Vion's Project Manager for Logistics & Supply Chain Management, and Michael Schippler, who is in charge of the company's vehicle fleet. Both of them have several children, and are determined to leave the environment in the best possible condition for the next generation. "Our aim was to reduce the emissions produced by our fleet, which currently consists of 140 traction units and 300 trailers", Schweiger explains. Since Vion's fleet was already equipped with ultra-modern vehicles, they looked for other ways to save fuel and cut CO2. At an event organized as part of the "Lean & Green" campaign, they got to know the Aachen-based aerodynamics specialists Betterflow, who came up with the idea of using aerodynamic devices to make the fleet even more economical and environmentally friendly.

Vion Food Group fitted three aerodynamic components to one of its trailers for a testing period lasting over six months. The first of these components was the socalled "front-wing" system, a fin that makes the roof area between the traction unit and the trailer less susceptible to turbulence. The wing was complemented by the addition of a special, highly-rigid membrane on the underbody of the trailer, reducing turbulence underneath the vehicle. Finally, a spectacular rear wing system was fitted. The wings open up automatically at speeds in excess of 60 kilometers per hour, reducing the downforce on the rear of the trailer and cutting drag by nine per cent.



"To really test how much we could save, we gave the vehicle to our very best drivers", Schippler explains. The results were dramatic. "In comparison to our standard trailer, we were able to reduce fuel consumption by up to two liters per hundred kilometers", the fleet manager says. Drivers also described the modified vehicle as quieter and easier to drive than the conventional model. "The results were so impressive that we have since fitted the system to another four vehicles", logistics expert Schweiger adds.

And although Schippler and Schweiger were primarily motivated by environmental concerns, they also have good news for cost-conscious customers: "Before diesel prices shot up, we calculated that the procurement and fitting costs were about 9,000 euros, and that we could recoup that money after 500,000 kilometers. With prices as they are now, that figure has dropped to 350,000 kilometers."

SHARP LINES SAVE FUEL: Daniel Sabelus estimates that the articulated truck saves 1.5 liters of fuel for every 100km it spends attached to the aerodynamic trailer.

7

An overwhelming response

The level of generosity shown by people in the wake of the Russian attack on Ukraine was almost limitless, and Knorr-Bremse Group employees were no exception.

KNORR-BREMSE EMPLOYEE VADYM STRASSER (RIGHT) AND HIS COLLEAGUE HERBERT EIBL organized a collection for refugees in Kematen in the Tyrol.



When Russia invaded Ukraine on 24 February 2022, a shockwave reverberated around Europe and the world. This was quickly followed by a global outpouring of goodwill and generosity. Individual Knorr-Bremse employees played their part in the relief efforts, as did the Group as a whole. Within six weeks of the start of the war, the workforce had raised almost 400,000 euros. The Group then matched that sum, meaning that the fundraising initiative generated almost 800,000 euros in donations. The Group also made an additional donation of 500,000 euros immediately after the outbreak of hostilities.

Another 50,000 euros came from the charity Knorr-Bremse Global Care, which has been supporting an orphanage in the western city of Lviv for a number of years. Following the outbreak of the war, the orphanage was used to accommodate internally displaced civilians. Global Care also funded the provision of food and accommodation, as well as medical and psychological support, for the 260 people who look to the center for protection every day - the vast majority of them women, children and the elderly. The children are also offered a range of leisure activities where the situation on the ground permits.

But Knorr-Bremse is doing even more to help. Since the war in Ukraine started, the senior management at our plant in Aldersbach in Bavaria have been opening up their conference center in Hofgut Eck to provide accommodation for Ukrainian refugees. Twenty-nine people have found temporary accommodation there, giving them the chance to recover, a least to some extent,



STRASSER'S COLLECTION was so successful that the vehicles were soon full to bursting.

from the horrors that have befallen their homeland. They have also been provided with psychological support and helped to take their first steps towards integrating into German society, including twiceweekly German lessons. For Knorr-Bremse's Executive Board, there was never any question of not providing this support: "This war is not only an attack on a free country, but also an attack on our freedom and values in Europe."

Many of Knorr-Bremse's employees across both its divisions have been personally affected by the conflict, and this was reflected in the generosity of their response. A number of sites – especially those near the border - took in Ukrainian refugee families and began collecting donations locally. Food, medicine and clothing were brought to the Ukrainian border, in some cases in the Company's own vans.

The example of Vadym Strasser, who works at Knorr-Bremse's facility in Kematen in the Tyrol, is just one of many. At the end of February, Strasser drove to the Polish-Ukrainian border to pick up his mother, who had arrived on a hugely overcrowded train from Kharkiv. He was so shocked by what he saw at the border that, together with his colleague Herbert Eibl, he decided to launch an aid initiative for Ukraine at their site. They quickly gathered together large quantities of bedding, clothing, toiletries, baby food and more, and the vehicles earmarked to deliver them were soon filled to capacity. A local haulage company then stepped in to transport the shipment from Vienna to the Ukrainian border. Strasser followed his collection with an additional fund-raising initiative, which he christened 48x8x48. A passionate ultra-trail runner, he decided to run an eight-kilometer route on his local mountain every four hours for 48 hours, covering a distance of over 100 kilometers with ascents totaling 4,500 meters.

An affair of the heart

Since the start of the war in Ukraine, many hauliers have become involved in aid initiatives. One of them is Celik Logistik's Mustafa Celik. For him, no road is too long when it comes to helping those in need.

STRONGER TOGETHER: An international team of Germans and Ukrainians unload donations from Mustafa Celik's second aid shipment

As the owner of Celik Logistik, a company based in Iserlohn in western Germany, Mustafa Celik has already taken truck-trailer combinations full of aid to Ukraine twice this year. Like so many others, Celik was shocked by the Russian attack on Ukraine. "I just couldn't get it out of my mind. I had to do something", he remembers.

That was why, shortly after the war started, he decided to start collecting donations and delivering them to Ukraine. "At first I had no idea how to do anything like that, so before I started I had to speak to various people and find out what was involved", he grins.

A lot of humanitarian shipments from Germany enter Ukraine via the Polish border, but Celik concentrates his efforts on south of the country; he has already been to Odesa and Mikolayiv, for instance. His reason for taking this less-than-safe route is simple: "People in the south of the country need help, too."

After organizing his first shipment in March, when he used two trucks to deliver donations in kind, he changed his approach for the second delivery, making an appeal to his customers that raised over 40,000 euros. The Christian charity Bibel- und Missionshilfe-Ost e.V. (BMO) then contributed another 20,000.

Celik used the money to buy 75 tonnes of aid, primarily food, toiletries and sleeping bags. With the help of lists of items provided by his contacts in Ukraine, he was able to identify which goods were in highest demand, and to buy them by the pallet. By the time the second shipment set off at the end of April, it was carrying some 90 pallets of aid. Food, toiletries and sleeping bags were particularly sought-after, but two items on the lists left Celik particularly shaken: body bags and antidotes for Sarin nerve gas. Dry yeast for baking bread was on the shopping list, too, since local production facilities had been destroyed by Russian attacks.

Celik explains that when he arrived in southern Ukraine, the people he met were unfailingly grateful, "but they were ashamed as well. You could see they felt uncomfortable asking for food." From what Celik could see, the

IT'S A FEW DAYS BEFORE the second shipment is due to leave, and this trailer is already fully loaded





Ukrainian government was also struggling to supply food to the military. "First of all, they have to supply multiple fronts, and second, there isn't enough food to go around." Nevertheless, once they had helped him unload the truck, the soldiers invited him for a meal and told him about the hardships of life on the front line.

Celik employs 90 people, and his fleet of 53 tractor units and 55 trailers usually criss-crosses Germany and Benelux laden with steel coils. His aid shipments to Ukraine have given a whole new meaning to his company's slogan of "Denken in Lösungen" (We think in Solutions). And there is no doubting his sincerity when he says, "I would do it again any time, even if I have had to use every trick in the book to persuade my wife ahead of the third shipment in September."

Celik is now preparing for this third trip to Ukraine. If the security situation allows, he will return to Odesa and Mikolayiv, this time with two trucks carrying 50,000 euros' worth of aid. When it comes to organizing aid shipments, there's not much he doesn't know.



UKRAINE: **Everyone is subjected** to stringent controls at checkpoints.

MUSTAFA CELIK was delighted with the donations he received for his first shipment.



THE TRUCKS on the autobahi en route to Ukraine.

A winning partnership

Knorr-Bremse TruckServices is crowned Best Commercial Vehicle Supplier by the Temot International dealer network.



ALL SMILES (L. TO R.): Temot shareholder Ronald Bulthuis, Knorr-Bremse's head of IAM Sales EMEA Fritz Messerli, Knorr-Bremse sales manager Miklos Gerendai, and Temot CEO Fotios Katsardis at the award ceremony.

> Knorr-Bremse TruckServices has won Temot International's Best Supplier Award 2022 in the Commercial Vehicles category – the first time it has taken this prestigious prize. As Fritz Messerli, Head of Sales & Marketing IAM Europe at TruckServices, commented at the award ceremony: "Temot has given us great support in implementing our aftermarket product strategy. Thank you very much to the Temot team for recognizing our partnership in this way and, of course, to all the members of the TruckServices team who are involved in it." Fotios Katsardis, CEO of Temot International, added: "In everything we do, we aim to be a reliable partner. So of course we are very proud of our winners, Knorr-Bremse."

> Temot International and Knorr-Bremse have been working together since 2014. The first contract between the two companies was signed in 2018, and was extended last year to run until 2023. The dealers that make up the Termot network supply the worldwide aftermarket with servicing and maintenance products for all types of vehicles. Between them, the organization's 101 shareholders are active in over 100 countries on five continents, and supply more than 12,000 workshops.

Double accolade for Knorr-Bremse

ETM Verlag's Readers' Choice Awards remained a happy hunting ground for Knorr-Bremse in 2022, as it took two more Best Brand awards in the Brakes and Retrofittable Turning Assistance categories.



For the second time in a row, Knorr-Bremse could celebrate a double success at ETM Verlag's highly-respected Readers' Choice awards. As in 2021, the world's leading producer of braking systems not only won the Stuttgart-based publisher's "Best Brand" award in the Brakes category – for the 17th consecutive time – but also took the top prize in the Retroffited Turning Assistance category thanks to its ProFleet Assist⁺ Gen 2 system.

Commenting on the awards, Bernd Spies, the member of Knorr-Bremse's Executive Board with responsibility for the Commercial Vehicles Systems Division, said: "The ETM Awards have been a major benchmark for our brand image for many years, as well as a significant yardstick within the commercial vehicle industry. So we are delighted to have won these two awards and to have convinced readers of the merits of our solutions.

ANDREAS WIMMER, of the Management Board of Knorr-Bremse Commercial Vehicle Systems, was delighted the company had picked up the prizes in the Brakes and Retrofittable Turning Assistance categories.

Thank you very much indeed for this enormous vote of confidence." Dr. Jürgen Steinberger, Chair of the Management Board of Knorr-Bremse Commercial Vehicle Systems, focused on the success of ProFleet Assist⁺ Gen 2: "The fact our retrofittable turning assistance system has won another award is a great endorsement for our aftermarket work, and shows we are well attuned to our customers' needs and requirements."

Braking technology roadshow



TOTALLY FOCUSED: Christian Schwigon (left) takes workshop owner Knut Wischmann (right) through the features of the new NexTT* disc brake.

Knorr-Bremse's mobile roadshow truck has been touring Germany, stopping off in five places to present the latest braking systems directly to customers and service partners. In Königs Wusterhausen, just south of Berlin, it called in on Wischmann Fahrzeugbau.



As Heiner Züwerink from Knorr-Bremse's Trailer Technical Sales Departthe Bavarian technician says. "It was well worth it. Now ment explains: "Our customers don't always have time to visit us at every I know what Knorr-Bremse is planning for the near futrade fair - so we come to them with our latest products." The concept ture and what we can expect as a vehicle manufacturer." has proved its worth, particularly in this era of coronavirus. With the He also praises the way Knorr-Bremse uses its mobile help of a practical demonstration on a large screen combined with roadshow to provide information directly to customers, full-size models, Züwerink makes the new generation of trailer compopointing out how difficult it is to engage in such intense nents more accessible and lends structure to what can be a very comdiscussions amid the hustle and bustle of larger trade plex subject. Every inch the sales professional, he answers their quesfairs. tions tirelessly until all the issues have been clarified.

Wischmann's own workshop team also makes use of the stopover to find out more about the iTEBS X EBS trailer, After a good two hours immersed in technical discussions, Obermaier is satisfied with his fact-finding mission. "It was a day well spent", the CSM air suspension module, the new POM LCon+ parking and maneuvering valve, and the NexTT[®] disc brake. Master metalworker René Sabin and master me-**(IC)** KNORR-BREMSE chanic Guido Kultus are just two of the interested Wischmann employees taking a curious peek at the new products showcased in the trailer. Of course, their interest is not exactly a surprise, considering they will be fitting Knorr-Bremse's new technology to the next generation of trailers. WISCHMANN



EMPLOYEE Guido Kultus is fascinated by the multimedia presentation inside the truck

THOMAS OBERMAIER (right) from Obermaier Fahrzeuge came from Neu Stassfurt in Saxony-Anhali to speak at length to Heiner Züwerink (left).

"We are presenting real innovations at the roadshow", says Christian Schwigon, one of Knorr-Bremse's field team responsible for relationships with local workshops.



KNUT WISCHMANN, and his company recently joined the Knorr-Bremse TruckServices Expert Network.

The new EBS trailer will enter service with leading OEMs in the first guarter of 2023, and over the years to come, the Wischmann team will have their first contact with the new products. It was Schwigon who arranged for the trailer, which is almost seven-and-a-half meters long, to make the trip to the A10 Autobahn in the southern outskirts of Berlin. Once it arrived, parking it on Wischmann's site was easy – all it took was a flat surface and a power supply. Then it was just a matter of pushing the steps into position and getting started.

When he approached Wischmann Fahrzeugbau about making Königs Wusterhausen part of the roadshow, he was pushing at an open door. As proprietor and Managing Director Knut Wischmann is keen to stress: "We have been a contractual partner of Knorr-Bremse since 1990. Relationships like that come with responsibilities. It goes without saying that I was happy to have the exhibition trailer park up and open its doors on my premises."



FAMILY FIRM WISCHMANN FAHRZEUGBAU in Königs Wusterhausen near Berlin has been in business for 115 years.



KNORR-BREMSE EXPERTS Heiner Züwerink (left) and Christian Schwigon field questions from visitors to the mobile exhibition in Königs Wusterhausen.

His family-run firm has been operating for 115 years, and is now in its fourth generation. With 18 employees, the company offers a full range of services for commercial vehicles: routine maintenance, accident repairs, full overhauls and other related services on all makes of trucks, trailers and bodies. Wischmann has a local reputation as a problemsolver, intervening to save the day when other workshops are at a loss and forced to throw in the towel.

The company recently extended its certification as a Knorr-Bremse partner, and is now officially supporting Knorr-Bremse's quality control program as part of the Knorr-Bremse TruckServices Expert Network for Trailers. So there is no reason why the mobile exhibition shouldn't make another visit to Königs Wusterhausen next year.

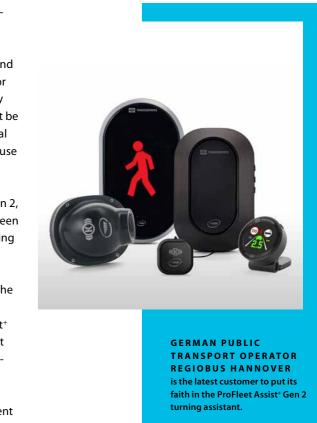
Making our roads safer

Regiobus Hannover has equipped 192 of its buses with ProFleet Assist⁺ Gen 2. The retrofittable turning assistant from Knorr-Bremse TruckServices enables drivers to detect road users in their blind spot.

Driving in cities, sometimes with narrow streets and confusing junctions, poses a particular challenge for drivers of trucks and buses. Turning can be especially nerve-wracking. Drivers not only have to pay attention to traffic lights and road signs and assess oncoming and crossing traffic - they also must watch out for pedestrians, cyclists or other road users alongside their vehicles, especially since these may not be aware that they are in the driver's blind spot and thus cannot be seen. Accidents can cause serious or even fatal injuries, so it is crucial to do all we can to prevent them. One way of reducing the risk is to use a turning assistant that can detect pedestrians and cyclists.

That is why Knorr-Bremse offers the retrofittable ProFleet Assist⁺ Gen 2, which uses computer vision algorithms to distinguish reliably between unprotected road users and other objects, thereby reducing annoying false alarms for the driver.

Regiobus Hannover, which operates bus routes in the area around the capital of Lower Saxony, is the latest bus operator that is convinced about the high quality of the system. It has just fitted ProFleet Assist⁺ Gen 2 into 192 of its fixed and articulated buses, as well as into eight further vehicles. As Elke van Zadel, Regiobus' Managing Director, explains: "Intelligent driver assistance systems are helping our drivers cope with increasingly complex situations on the roads. That is why Regiobus has opted for a complementary system designed to prevent accidents. We are delighted with our investment in Knorr-Bremse's comprehensive turning assistant, which delivers outstanding quality and functionality." Alexander Wagner, Vice President EMEA Aftermarket/TruckServices at Knorr-Bremse, is convinced the new system will reduce accidents: "By retrofitting the system to 192 of Regiobus Hannover's buses, we are making an important contribution to increasing road safety by reducing the risks associated with accident blackspots. The decision is a clear step towards our vision of zero accidents."



A weekend to set the pulse racing

After a three-year break, the Truck Grand Prix has finally returned to the Nürburgring. Lukas Hahn marked a milestone in his career by taking his first victory in a European Championship event, while a rule change planned for next year made headlines off the track.



PURE EXCITEMENT: The field is incredibly tight. In the foreground you can see the number 22 truck of Lukas Hahn

The Truck Grand Prix finally made its much-anticipated return to the Nürburgring this year. Across the three days of the race weekend, a total of 97,000 spectators flocked to the Eifel mountains. Fans and drivers alike were relieved that, this time, no pandemic or natural disaster ha stopped the event from going ahead. Even the Nürburgring's infamously fickle weather gods were in a good mood, bathing the 35th Truck Grand Prix in three days of beaming sunshine.

Speaking of which, "beaming" would be a fitting description of Jochen Hahn's mood. As well as celebrating a race win of his own, which elevated him to a promising second place in the overall drivers' standings, he could also look on with paternal pride as his son, Lukas, took his first career victory in the European Truck Racing Championship, in his rookie season in the category. "I celebrated like I never had before, and my dad had tears in his eyes", Lukas said afterwards, giving some indication of just how much the moment at the 'Ring' meant. It is no exaggeration to describe this year's Truck Grand Prix as three days of pure excitement. As Jochen Hahn commented, "It was breathtaking to be able to race in front of so many fans, partners and sponsors again." And from a sporting point of view, the season is shaping up very nicely indeed. "It's got even closer at the front of the field", Jochen Hahn observes. "If you make any mistakes at all, you'll be punished for them." The European Championship title will be decided in the final races of the year, across the late summer and fall, and Jochen Hahn is in confident mood: "If we hook everything up perfectly, we can still do something in this championship. It's not over until all the points have been counted!"

Another important point to mention is that the European Truck Racing Championship is becoming ever more sustainable. The United Nations welcomed the series into its UN Sport for Climate Action program back in 2021, and it is the first official FIA championship anywhere to switch to fuel made entirely from renewable raw materials. In 2023, Europe's fastest trucks will take things a step further, as new regulations give teams the option of running electric and hybrid trucks on the track.



THRILLED TO BITS: Lukas Hahn took his first European Championship race victory at the Nürburgring.



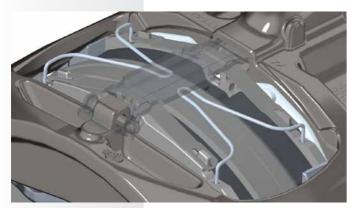
EYES ON THE PRIZE: Can Jochen Hahn overhaul Norbert Kiss to become the 2022 European Champion?

Active Pad Release (APR system) good for the environment, and for your wallet

Active Pad Release (APR) is a retrofittable system for SN7, SM/SL7 and ST7 brakes that helps users reduce particulate emissions and save fuel.

Digital clarity

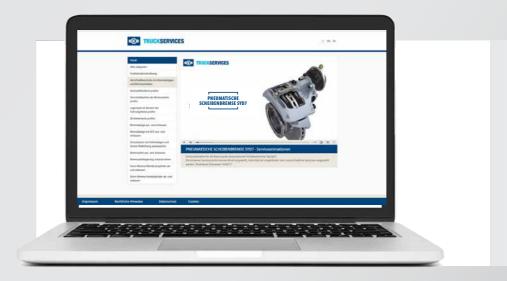
The servicing instructions for pneumatic disc brakes will soon be available in an attractive new digital format.





ACTIVE PAD RELEASE (APR-SYSTEM) can reduce fuel consumption by up to one per cent.

In the latest-generation SYNACT® brakes, the Active Caliper Release (ACR) system actively separates the pad from the disc and centers the caliper back to the center of the brake disc. Active Pad Release (APR) does a similar job, and will soon be available as a retrofittable system for SN7, SM/SL7 and ST7 brake systems. The Active Pad Release (APR system) is attached directly to the brake pads, and actively releases them faster from the disc. It works by equalizing the gap between the outer pad, the brake disc, the inner pad and the pressure elements by quickly pressing the pads out. Since the brake pads are already designed to accommodate Active Pad Release (APR system), retrofitting it is easy. In addition to the introduction of Knorr-Bremse's Active Pad Release to the European market means that European customers can use the same environmentally-friendly, water-friendly, copper-free brake pad quality that the company is already offering in the United States. When combined with the Active Pad Release (APR system), the new brake pads also reduce particulate emissions, optimize wear, and reduce fuel consumption by up to one per cent.



With its latest generation of SYNACT® SyD7 brakes, Knorr-Bremse is breaking new ground in terms of technical documentation. In future all our new servicing instructions for Air Disc Brakes will be available in a digital, interactive, animated format. The modern, user-friendly documentation will allow users to go directly to individual servicing steps, select subtitles or choose various languages - so there is no need to painstakingly print out service documents and flick through them searching for the relevant page. For those who still prefer traditional printed documents, the good news is that they will still be available alongside the digital versions.



THE NEW DIGITAL FORMAT FOR SERVICING instructions will complement traditional documentation

The exact part you need - readily available

Knorr-Bremse TruckServices has expanded its system for finding brake pads and brake discs to include drum brake linings. They have also given it a new name: Brake Parts Finder.

A wide range

Knorr-Bremse aims to offer all its customers the perfect solution for their needs. Our range of spare parts for braking systems exemplifies our approach.

THANKS TO THE BRAKE PARTS FINDER. finding spares for brake systems couldn't be easier

> Knorr-Bremse TruckServices' system for finding brake pads and discs is becoming the Brake Parts Finder. But the name is not the only thing that's changing. The range of products on the system now includes brake linings in addition to pads and discs. The look of the online app is staying the same, though. The Brake Parts Finder makes finding the parts you need as easy as possible, whether you're working from a laptop, a tablet, or a smartphone. Thanks to the interface's helpful icons and clear structure, navigating the app is child's play. Not only can users find the right spare brake components for their vehicles: they can also go directly to the detailed item description in the online TruckService Customer Portal by simply clicking on the relevant part number.

You can access this helpful tool by going to

https://truckservices.knorr-bremse.com/wheelend-parts-finder/



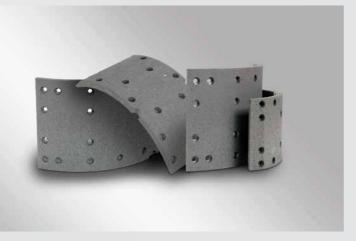
Knorr-Bremse's mission is provide its customers with the most comprehensive range of high-quality products in the market. That is why Knorr-Bremse TruckServices is progressively expanding its selection of brake discs, linings and pads to provide solutions for any maintenance or repair requirement. Just like all the other products Knorr-Bremse TruckServices delivers, our range of spare parts meets the most stringent quality standards; every part is compatible with the original part quality, and subjected to the tests for ECER90 certification.

Step by step, Knorr-Bremse TruckServices is looking to complete its range of brake discs for commercial vehicles by adding applications for pneumatic and hydraulic disc brakes. Due to the advanced design and material composition and the very latest materials, all parts provide outstanding resistance against thermal cracking.



KNORR-BREMSE IS CONSTANTLY EXPANDING its range of spare parts for braking systems.

When it comes to drum brake linings, TruckServices can rely on 100 years of expertise from US-based firm Bendix. It all adds up to premium quality and cost-effective maintenance. In keeping with our commitment to comprehensive, customer-focused service, all our brake lining products come complete with rivets to match.



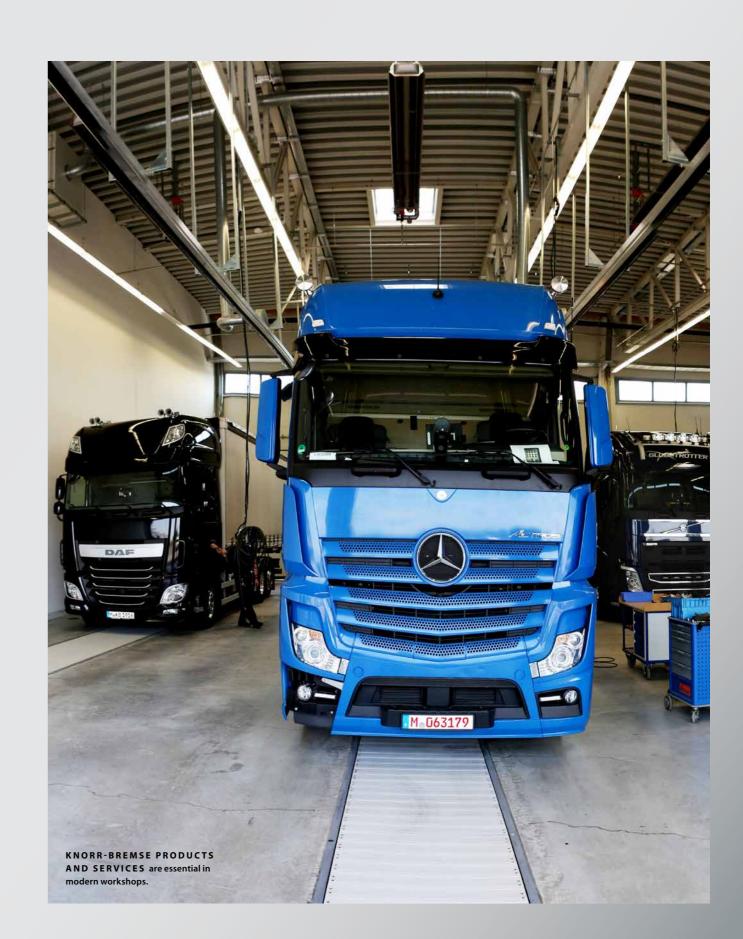
DRUM BRAKE LININGS from Knorr-Bremse TruckServices deliver cost-effective maintenance.

Alongside its own range, Knorr-Bremse TruckServices' adds to its range brake pad kits for commercial vehicles for brake systems from other brake manufacturers.

Brake pads and accessories are definitely convincing with OEM-like quality. New feature: Copper-free pads. Knorr-Bremse is already using these in the United States, helping to reduce particulate emissions and protect our waterways.



COPPER-FREE BRAKE pads help protect the environment.



New filters for commercial vehicles

Knorr-Bremse TruckServices is adding 120 applications covering all major European truck manufacturers to its filter range, which now also includes AdBlue and coolant filters.

One for all

Knorr-Bremse TruckServices' new air dryer for MAN applications is designed to replace multiple previous models, and therefore lightens the load on workshops.

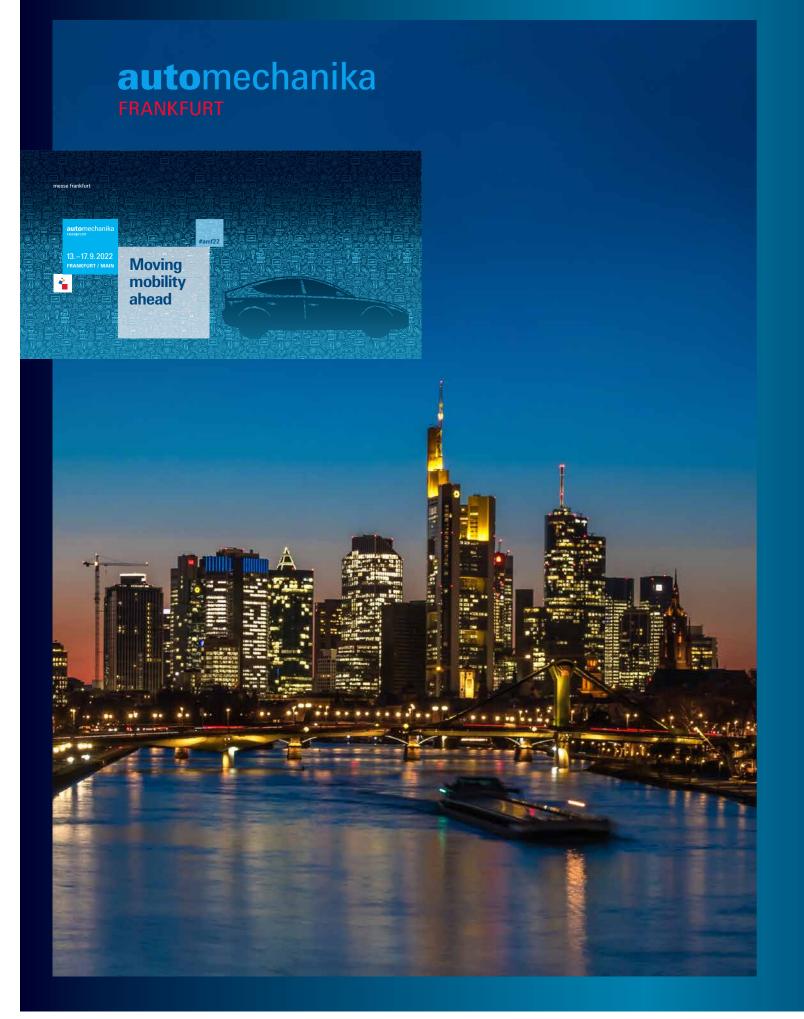


KNORR-BREMSE TRUCKSERVICES' EXPANDED FILTER PORTFOLIO stands out thanks to its proven OEM quality.

> Drawing on the deep product expertise that comes from 20 years of filtration experience, Knorr-Bremse TruckServices has added another 120 filters to its portfolio, covering all major commercial vehicle manufacturers. New models for AdBlue and coolant have now joined its tried-and-tested range of premium air, interior, fuel and oil filters. All of them represent excellent value for money, reducing vehicle running costs without compromising functionality or safety. And when it comes to quality, every single one is comparable with OEM components – as proven by benchmarking tests.



Knorr-Bremse is expanding its aftermarket portfolio with a new air dryer for MAN applications. Its combination of high performance and durability makes it stand out from the crowd. Best of all, it replaces various existing Knorr-Bremse air dryers, and even ones from competitors, so workshops and dealerships no longer have to keep multiple models in stock. The new MAN air dryer from Knorr-Bremse is all you need. A PERFECT ALL-ROUNDER: the new air dryer for MAN applications.



Advancing together

From September 13 to 17, Knorr-**Bremse TruckServices, together** with an international team and a digital exhibition concept, will be engaging with customers and experts at the Automechanika trade fair in Frankfurt am Main. Complementing this there will be an informative presentation to the Automechanika Academy.

Knorr-Bremse TruckServices' mission statement is clear and simple: Trucks belong on the road – only that way can they earn money. Which is why the Munich-based company is doing all it can to ensure that its products and services keep trucks, buses and trailers running smoothly – helping them to quickly, easily and cost-effectively benefit from high mileages, minimal downtimes and greater safety. The Knorr-Bremse TruckServices motto for the 2022 Automechanika trade fair in Frankfurt am Main sums it up: "You move the world. Together we keep it running"



IN 2018 KNORR-BREMSE

TRUCKSERVICES showed interesting product and service olutions. On the following pages you will find not only pictures of the oducts to be showcased at utomechanika 2022, but also npressions of the various product presentations from the 2018 trade show appearance.

To find out how and where Knorr-Bremse TruckServices supports its customers, you should visit Booth E91 in Hall 3.0 at Automechanika. Whether the focus is on new service products, refurbished EconX® products, service kits, wear parts or tools: the 40 trade fair staff at the 300-square-meter booth will be taking customers on a digital journey through the Knorr-Bremse TruckServices product world. With a mixture of one-to-one expert discussions and state-of-the-art digital presentations on screens at various locations, every visitor to the trade show will experience a unique event.

A large number of new products in the Knorr-Bremse TruckServices portfolio will be on show. One that stands out in particular is the **SYNACT® Pneumatic Disc Brake** with the type code SyD7. Its caliper and brake carrier have been weight-optimized and externally redesigned, and the pad concept modified and patented – as can be seen from the different lengths of the internal and external pads and the new design of the pad holder. The tried-and-tested aftermarket service concept includes not only caliper units but also all the necessary wear parts and service kits. Another feature of the brake is the Active Caliper Release System (ACR), with a system of springs separating the pad from the disc and centering the caliper. This reduces fuel consumption and pad wear.





WHETHER DIGITAL PRESENTATIONS OR FAMILIAR CONVERSATIONS under the motto "You move the world. Together we keep it running", Knorr-Bremse TruckServices shows the wide range of its products and services.

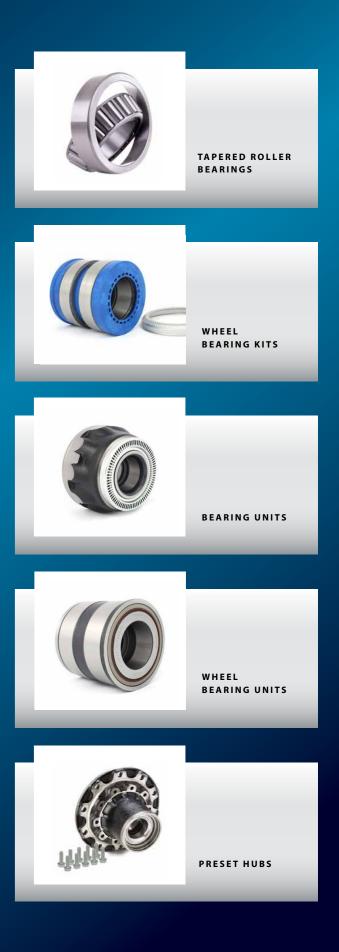
Above images show preliminary views of the Knorr-Bremse TruckSevices booth at Automechanika 2022.



NEW SYNACT* (SYD7) pneumatic disc brake with Active Caliper Release System (ACR)



Knorr-Bremse TruckServices always aims to offer its customers efficient solutions for the entire spectrum of commercial vehicles which is why, as an aftermarket specialist, it has added a broad range of wheel bearings to its portfolio. Because of the loads generated during operation, wheel bearings are subject to considerable forces and have to function smoothly under the most critical working conditions. In the Spanish company Fersa, Knorr-Bremse TruckServices has found a partner that matches its high quality standards for developing and manufacturing wheel bearings in OEM quality. Its extensive range for trucks, buses and trailers includes not only tapered roller bearings but also wheel bearing kits, bearing units, wheel bearing units and preset hubs. The product range is supplemented by the corresponding tools.



Useful additions to the EconX[®] range will also be presented at the trade show in the form of caliper units for **SL7 and SM7 calipers**. With these widely used brake types, Knorr-Bremse TruckServices is also continuing its strategy of offering suitable solutions for every age of vehicle. A special remanufacturing process ensures that older vehicles are as safe on the road with Knorr-Bremse EconX[®] products as with brand new service products. Assembled, tested and produced according to OE guidelines, the remanufactured products are appropriate for the age of the vehicle without compromising functionality and safety.



ECONX® SL7 / SM 7 brake calipers

It is with some pride that at this year's Automechanika Knorr-Bremse TruckServices will be presenting the second generation of its retrofittable turning assistant ProFleet Assist⁺, which is based on Mobileye's EyeQ4 computer vision chip for retrofit applications. Pride, because the current solution and its predecessor have already twice won the title of "Best Brand" in the readers' poll conducted by the prestigious commercial vehicle publisher ETM in Stuttgart. But the Company's pride also comes from the fact that the innovative assistance system offers a range of benefits for commercial vehicle drivers and thus contributes to Knorr-Bremse's goal of developing a completely accident-free freight and passenger transportation system.

The system offers extremely high accuracy and speed in detecting vulnerable road users such as cyclists and pedestrians. Compared to the previous version, its ability to recognize dangerous situations in twilight and darkness has been significantly improved. Heating elements on the cameras ensure safe operation even in sub-zero temperatures, and wirelessly transmitted software updates mean drivers can easily benefit from functional improvements and new performance features.







NEW SET OF INDICATORS for testing the functioning of the adjuster on a pneumatic disc brake. Regular visitors to Automechanika are well aware that Knorr-Bremse TruckServices' trade fair presence would not be complete without the traditional promotional giveaway at the end of every visit. This year, visitors will receive a set of two indicators for testing the function of the adjuster on Knorr-Bremse pneumatic disc brakes. These are intended to stimulate interest in the complete set, which is due to go on sale shortly. One of its special features is that it can be used for a number of different brands – as well as for testing several brakes simultaneously. The indicators come in pairs, so can be used to check an entire axle. All you do is place the appropriate indicator on the adjuster, apply the brake, and use the movement of the arrow to check whether the adjuster is functioning correctly.







Tip: Automechanika Academy

Knorr-Bremse TruckServices will be giving a presentation as part of the Automechanika Academy. Horst Fischer, long-serving head of the Knorr-Bremse TruckServices training staff, will be informing the audience daily from 14.00 to 14.15 on the subject of "How Knorr-Bremse TruckServices supports commercial vehicle professionals in their dayto-day workshop activities". The five elements of technical support will be demonstrated using the example of the disc brake. The presentation will take place in the outdoor area at P11, B03.

PEOPLE AND GOODS ON THE MOVE

Discover the latest in fossil-free and digital logistics.



Join us in Hanover from September 20-25, 2022. Tickets available at iaa-transportation.com



Knorr-Bremse at IAA TRANSPORTATION 2022

Knorr-Bremse is a leading systems developer and a strong OE partner for the ongoing transformation of the commercial vehicle industry

At IAA Transportation, we will be showcasing groundbreaking solutions for the truck sector, covering everything from autonomous driving and e-mobility to connectivity and road safety



IAA 2018:

Digitalization is exerting a huge influence on vehicle design and development, opening up unprecedented opportunities for traffic safety, autonomous driving, e-mobility, connectivity and sustainability. However, as our roads become more reliant on digital systems, those systems have to be more reliable than ever before. Continuous improvement of traffic safety has been part of the Knorr-Bremse story from the very outset. The Company's expertise in safety-critical products consists in developing systems with superior functionality, efficiency, reliability and sustainability that offer added value to customers. This also applies to automated driving and e-mobility, as Knorr-Bremse is determined to enable customers to develop future-proof commercial vehicles and business models.

Even four vears ago there as an emphasis on igitalization at the Knorr-Bremse booth The pictures on the following pages show the ombination of physical products and interactive

$\rangle\rangle$ **IAA** TRANSPORTATION

At IAA Transportation 2022, Knorr-Bremse will be presenting state-of-the-art innovations as we move towards the future of the motor vehicle. We will be using the latest interactive digital technology, but will also be taking an analogue approach in the best sense of the word, with plenty of our specialists on hand for face-to-face discussions.

Advanced Driver Assistance Systems (ADAS) and highly-automated driving

Two of the main objectives when developing driver assistance systems are to reduce typical hazards and improve protection for at-risk road users. Knorr-Bremse already offers reliable, ground-breaking solutions, for example for precisely identifying and classifying at-risk road users. Our Blind Spot Assistant system to help drivers spot cyclists when turning, and the Moving Off Information System (MOIS), which is designed to prevent accidents caused as vehicles take to the road, are just two of the new systems we will be presenting at the fair. Road sign recognition technology is another development that will be helping to make our roads safer in the future.

Knorr-Bremse is also using its decades of expertise in safety-critical systems to continue to drive developments towards highlyautomated driving (HAD). Our range of products stretches from Minimal Risk Maneuver systems designed to bring the vehicle automatically and safely to a halt if the primary braking system fails, to Mission



AT THE EXHIBITION STAND C21 IN HALL 12, guests can expect a combination of expert discussion and digital presentations of Knorr-Bremse products and services



Complete functions, which meet the requirements of (at least) automation level 4 by enabling vehicles to continue to operate even if a fault occurs in a safetycritical system such as braking, steering or power supply. The unique aspect of these systems is their use of intelligent redundant design, which effectively ensures that underlying sub-systems do not fail. A key element of this approach is Global Scalable Brake Control (GSBC), which has now been upgraded to a highly-available redundant system (rGSBC).

Your engineering partner for the switch to electric vehicles

In 2020, Knorr-Bremse set up its own innovation unit for e-mobility, known as the eCUBATOR, and charged its staff with actively shaping the transition to electric commercial vehicles. At IAA, Knorr-Bremse will be presenting some of the market-ready products to emerge from the eCUBATOR, including its all-electric EPS steering system, rotary vane and screw e-compressors, the SYNACT[®] Radial disc brake system, and the eGSU gear control unit. Other energy-efficient and safetyrelated innovations from our new product range include eVMC (Electric Vehicle Motion Control) and the redundant power management system (rPMS).

Knorr-Bremse is helping protect the environment and reduce carbon footprints

At the IAA, the Company will offer stakeholders a comprehensive insight into its activities aimed at promoting sustainability, both in individual products and across the

Company as a whole. Fighting climate change is a major focus for those efforts. As you would expect, Knorr-Bremse's commitment to keep on improving sustainability across its product range is a big part of its efforts to protect the environment. Technologies and solutions from Knorr-Bremse, designed in line with our EcoDesign concept, are already contributing to decarbonizing the commercial vehicle industry, and our approach to protecting the environment will figure prominently in our product presentations at the various communication points across IAA Transportation. Examples of these environmentally-friendly products include our electric compressors, our re-manufacturing portfolio, and the Active Caliper Release (ACR) system. This uses a system of springs to separate the pad from the disc and center the caliper, allowing the brake disc to return to free running more quickly after braking has ceased. The overall effect is a reduction of fuel consumption of up to 1 percent, as well as reduced wear on the brake pads.

Working continuously to improve road safety has been part of the Knorr-Bremse story from the very outset. At this year's IAA, we will be providing further insights into the capabilities of the various elements that make up the vision of "Zero Accidents".

Examples will include the GSBC systems mentioned above, as well as the modular SYNACT[®] air disc brake family with the variants SYNACT[®] Radial and axial SYNACT[®] Compact. In addition to EPS, Knorr-Bremse will also be presenting AHPS, the superimposed Advanced Hybrid Power Steering system developed to meet ADAS and HAD requirements right down to fail-operational applications.

Future-proof technology for safer roads

The latest trailer technology will also be on display – demonstrating the possibilities offered for brake and chassis control, for example by the NexTT weight-reduced disc brake and the iTEBS X trailer EBS, as well as in the field of driver assistance systems for trailers.

Digital information, analogue exchanges

Visitors to Knorr-Bremse can look forward to a state-of-the-art digital trade fair concept. From 20th to 25th September 2022, in the public area at booth C21 in Hall 12 they can expect a combination of expert discussion and explanatory displays using interactive touch screens and virtual product tours. At the heart of it all will be a center display presenting the main product innovations in areas such as road safety, as well as communication points offering in-depth insights into key trends and the technologies and systems behind them.

Knorr-Bremse is well-prepared for the new era of the truck. Visitors to the Knorr-Bremse booth will be able to see this for themselves.

Bring the teacher home with you

Knorr-Bremse is constantly working to digitalize its training programs. Now participants can learn at home in our virtual classroom.

IN-PERSON TRAINING is still indispensable in some areas such as electronically controlled braking systems



Some training sessions still have to be done in person, especially in practical areas like electronically controlled braking systems, because the participants need to be able to prove they can diagnose faults on a real system after completing their courses. The same applies to training on safety inspections, because the law dictates that this must include actual inspections on real vehicles.

Knorr-Bremse's professional development experts have also been working on the design of our training courses, including modifying basic training on compressed air braking systems to bring it up to date. Training on the new EBS iTEBS X trailer will also be available in the virtual classroom, either as a stand-alone topic or as part of a series of courses on the TEBS G2 product range, as soon as it goes into series production.

Last but not least, Knorr-Bremse has also expanded the number of e-learning courses it offers. The latest additions feature a range of topics for which we no longer provide training in person, such as braking force regulators or TEBS4, and the material you need to master to extend your TEBS G2 PIN. In future, you will also be able to use e-learning software to gain a useful grounding in compressed air braking systems for commercial vehicles. Finally, there is one last thing you need to know: all our e-learning courses include tests to check progress against learning outcomes, and come with certificates of completion.



PARTICIPANTS CAN USE THEIR LAPTOPS to log in to Knorr-Bremse's virtual classroom from home

> Learn more, spend less: flexible digital training helps companies save both time and money. Knorr-Bremse is well aware of the benefits this approach can bring, which is why it is working hard to develop its range of digital training courses. The latest innovation is a virtual classroom for our one-day training course on pneumatic braking systems. Only the trainer actually has to be in the classroom; the students can register and join the class using their PC or laptop, wherever they happen to be. Despite not being in the room, they still get the chance to interact with the trainer, because they can ask guestions online anytime. Training in the virtual classroom can also help participants prepare for in-person courses on EBS braking systems.



Braking force for forestry

 IT'S NOT ALL ROMANTIC: Transporting wood products is demanding work for man and machine.

COLORFUL: Ressenig's modern headquarters in Kobenz



Transporting timber requires the very highest levels of driving skill, as well as the highest-quality vehicles. That is why Austrian body manufacturer Ressenig relies on Knorr-Bremse parts.

If you have ever had the chance to watch drivers transporting timber in a forest, you are bound to have been impressed by their professionalism, skill and physical fitness. For these drivers, fitting and re-fitting snow chains to their tractor vehicles and trailers is all in a day's work, as maneuvering and reversing in the tightest of spaces and in low-grip conditions. Transporting timber safely requires a highly-skilled driver, but you also need the right vehicle for the job.



"Knorr-Bremse parts are great when it comes to meeting the high standards we set for our products."

> Christian Reiter, Product Specialist at Ressenig



FLEXIBLE: Ressenig supplies no fewer than 21 different models of trailers and semi-trailers for the forestry industry.

One Austrian firm can be relied upon to deliver top-quality systems designed to meet this challenge. Ressenig Fahrzeugbau, which operates two sites in Vilach (Carinthia) and Kobenz (Styria), is a renowned specialist in the field, providing comprehensive solutions for loading and transporting goods in forests and other agricultural environments. As Ressenig product specialist Christian Reiter explains: "When it comes to forestry, it's not just the heavy loads that are a key factor, although they do make particular demands on the vehicles. Working with timber as a raw material is often challenging in itself."

Ressenig can look back on a proud history. Domenicus Ressenig founded the company in Villach back in 1904, originally as a blacksmith and carriage builder. As the firm entered its second generation, it expanded into maintenance of agricultural machinery. In 1972, under third-generation CEO Josef Ressenig, it produced its first timber transporter, marking a successful entry into truck manufacturing and the beginning of the division that is now the mainstay of the company.

Austria is heavily forested, so it is only natural that the Austrian OEM's home turf is also one of its biggest markets, but a large proportion of its production is also exported. As Christian Reiter points out, "We have satisfied customers all the way up to northern Scandinavia."

Ressenig's wide-ranging portfolio of forestry products covers everything from stanchion trucks to trailers, semi-trailers and tailored solutions for transporting wood chippings - reflecting the sheer range and specificity of their customers' requirements. For example, the company produces no fewer than 21 different trailers and semi-trailers for

use in forests, from a 2-axle, central-axle log trailer to a 3-axle cranked semi-trailer for logs.

Ressenig's top priorities are quality, service, and customer focus. "This is possible for several reasons, including our production facilities, the fact everything is manufactured in-house across 15,000 square meters of premises, and the comprehensive range of materials in our warehouse, which means we can act independently to respond quickly and flexibly to customers' requirements in terms of vehicle construction and repair", explains Reiter, providing an insight into the firm's philosophy and the secret of its success.

As you would expect, Ressenig's stringent quality requirements also apply to all the individual components that find their way into their products. Indeed, the company's mission is to provide "quality every step of the way, from supply chain, to production, to delivery." This is one reason why many of the trailers and semi-trailers it produces at its plants in the south of Austria are fitted with the premium TEBS G2.2 brake module. "Knorr-Bremse components are great when it comes to meeting the high standards we set for our products", says Reiter.

Vehicles for transporting wood products represent just one of several pillars of Ressenig's business. The Austrian firm also produces vehicles for the construction industry and freight transport, as well as bespoke bodies for specific purposes. Some of its most unusual products include the vehicles produced by its Armoring division, which supplies military vehicles, custom bullet-proof off-roaders, and trucks designed for transporting valuable goods.

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The premium brake module



Many of Ressenig's trailers are fitted with Knorr-Bremse's TEBS G2.2 premium brake module. The electronic braking system combines an electronic control unit, sensor technology and a pneumatic control valve into one compact unit. The module itself incorporates the control systems for loadrelated and anti-lock braking. This means the braking power generated by the system can be controlled more precisely and consistently and with reduced hysteresis than with conventional braking systems. The result is better compatibility between tractor vehicle and trailer, optimizing wear on the brake pads and reducing overall operating costs. The TEBS G2.2 also includes the tried and tested Roll Stability Program (RSP) safety system as standard. The premium model boasts multiple additional features designed to increase performance and comfort, and comes optimized for use with iLvl electropneumatic suspension. In addition, its built-in electric inputs and outputs and pneumatic P28 output can be used to control and incorporate a wide range of additional components as part of the overall system.



LOYAL ASSISTANTS FOR AND BY PROFESSIONALS

PROFLEET ASSIST⁺ GEN 2 POWERED BY MOBILEYE®

The retrofittable turning assistant ProFleet Assist⁺ Gen 2 and other integrated driver assistance systems help improve road safety. Sophisticated algorithms analyze the driving environment and warn the driver with visual and acoustic signals. Thanks to our installation partner Alltrucks Truck & Trailer Service, you can benefit from a Europe-wide network for a reliable installation of the turning assistant.^{*}

| profleetassist.knorr-bremse.com |

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*Only at participating partner workshops from the Alltrucks workshop network

