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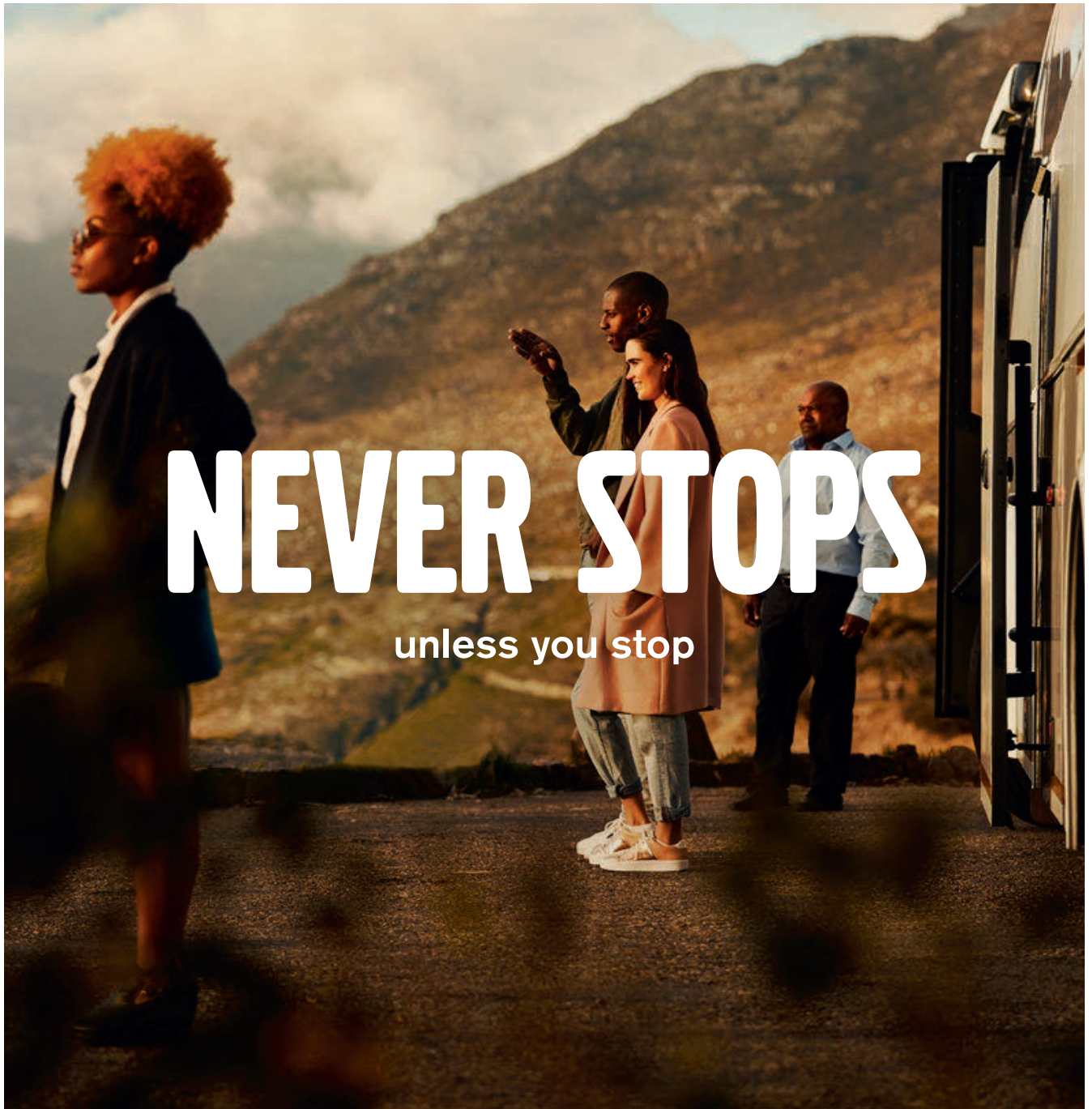
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Electrified and Energised



It has been an exciting three months since the last issue of Asian Buses. During that time, a lot has happened. The cancellation of railway projects in Malaysia will surely have an impact on the bus industry. After all, we all need more and better connectivity. At the same time, we see that the Ministry of Transport has seen an injection of fresh energy and our newly minted Minister of Transport is not wasting any time to address issues that have been lingering. I have had the pleasure to meet YB Anthony Loke Siew Fook and to see first hand how energetic he is in his approach to improving the industry. I hope that we can all chip in and support him and his ministry as it would be in our best interest as well. One area where we all need to be more involved is road safety.

At the recently held IAA in Hannover, I felt that global players have taken to energising the business. Electrification and alternative fuels seemed such a science fiction topic some six or eight years ago! Today, hardly any exhibitor at the show did not deal with electrification or connectivity; the latter many claim is needed for the former. With the idea of using electric power to move buses also came a push for innovations that went beyond the powertrain. I was amazed to see what possibilities that there are now: you can program your charging station to charge your vehicle when the power is cheaper as a result of oversupply in the powergrid. A small change in the way an electric motor is constructed can actually increase the range of a bus some 80 Kilometers. I can see that we have overcome the age of "range anxiety" and we are set to go further with electric vehicles.

For this issue we met a lot of people that are very positive. In Singapore, Scania is headed by an energetic Swede who will be building upon the foundation that his predecessor has laid. Meanwhile, in Germany, I spoke to a few people in Hengst and they are excited to see that their South East Asian business is taking off so well. There is a lot to be filtered and innovative solutions are certainly needed and welcome. I am fascinated by the drive to innovate. How do people come up with these ideas?

And maybe it was just an idea that set a converted MAN in motion to Mongolia? While attending an event there, I met with a couple that is from a town near my old home in Germany. They went all the way to Ulaanbaatar on a land route they planned themselves. I would think that takes a lot of energy as well. In my chat with them, I actually found out that the journey energises them as they are independent and at liberty to go where they want, away from a busy schedule or a tightly packed tour plan. While I like the comfort of a proper bed in a hotel, I admit that I admire people like that as they will end up with many good stories to tell.

As I continue my journey with you, I am always energised to hear what drives your business. If you an interesting story to tell, please let me know. On top of that, I hope to see many of you at our exhibition, which is nearing as well. This time, we will host MCVE in June 2019.

Drive safe!

A handwritten signature in blue ink, appearing to read 'Stefan Pertz'.

Stefan Pertz
Editor, Asian Buses Malaysia

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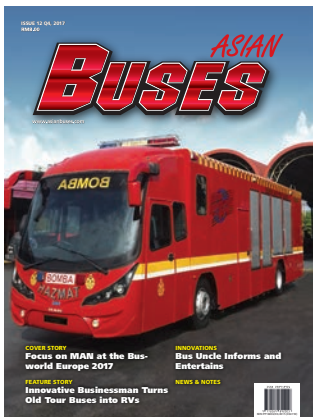
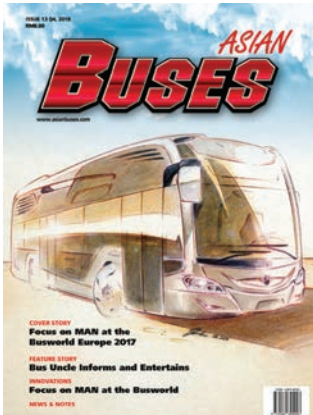
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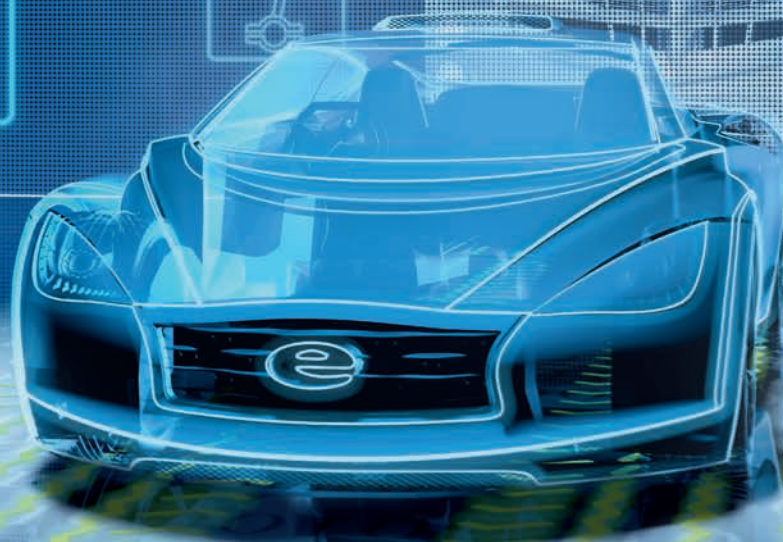
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Automechanika Insights



A fixed calendar item, Automechanika Shanghai is set to be another success this year. We had the chance to learn more about the event from one of the key people in the organisation. Here is what Ms Fiona Chiew had to say:

AT: Tell us a bit about yourself and your role with Automechanika Shanghai?

I am the Deputy General Manager, Messe Frankfurt (Shanghai) Co Ltd, one of the organisers behind Automechanika Shanghai. The show will take place from 28 November to 1 December 2018 at the National Exhibition and Convention Center in Shanghai.

AT: Tell us a bit about the event - what makes it so important to the global vehicle service and repair industries?

Now in its 14th year, Automechanika Shanghai is Asia's largest trade fair for automotive parts, equipment, accessories and services. The show is in a unique position in that it covers the entire supply chain for the global automotive industry – from parts, components, electronics and systems, to repair, maintenance, accessories, customisation and tyres. This year, the show will welcome an estimated 140 000 buyers and 6 250 exhibitors, who will be meeting and doing business across a huge 350 000sqm of exhibition space.

Speaking specifically about the show's relationship with Repair & Maintenance (R&M) sector, this is most certainly an area which is gaining more and more interest from our participants as each edition passes. We like to think that our show grows and evolves alongside the industry's own developments (especially in China's fast-paced market where car ownership is rising and the aftermarket landscape is shifting), and these days our R&M coverage is stronger than ever.

Both halls 5.1 and 6.1 will be solely dedicated to R&M this year, where visitors will find a number of solutions

for painting and collision repair, remote maintenance, diagnostics, new workshop technologies, workshop management and more. Not only that, we will also have an array of fringe events which will offer practical guides on the transformation of repair workshops.

AT: How do you ensure the profile of the event meets the needs of the automotive service industries and remains relevant to those within it?

Like I said, every year we want to make sure that our show is a true reflection of where the industry stands at that particular time, whether that be an upcoming trend in electronics or car connectivity, or even something as specific as tyres and remanufacturing.

This is what has helped the show continue its upward trajectory in terms of participant figures and scale – people keep coming back to Automechanika Shanghai because they know it's the place to keep abreast with everything that's happening across the entire industry.

AT: What are the main focuses for the 2018 event?

We have placed a lot of emphasis on three particular highlights in 2018. One is the aforementioned Chain Stores Zone. Elsewhere, we have a brand new area for Tomorrow's Service & Mobility, which will feature the most essential elements of car connectivity, electronic vehicle innovations, electric controls, charging and battery technology, connected cars and testing equipment. This part of the show in the North Hall really represents where we think the future of the automotive industry is heading.

AT: Do you have anything you would like to add or a specific message for our readers?

On behalf of the team behind Automechanika Shanghai, we look forward to welcoming some of you to China in November this year. The show will open your eyes to the possibilities of expanding business not only with the Asian market, but with the entire industry's biggest names. Enjoy the show! 🚗

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Driving Change Through CAV

Hong Kong and Singapore take contrasting approaches to the adoption of autonomous vehicles details Arcadis, a global Design & Consultancy for natural and built assets.

The arrival of Connected and Autonomous Vehicles (CAV) will have a disruptive influence on urban mobility, and a new report from Arcadis outlines how CAVs present a huge opportunity to radically transform how we live. Citizens in Motion, from the leading global Design & Consultancy for natural and built assets, discusses how the emerging CAV revolution has the potential to improve cities and people's quality of life.

The report looks at 14 global cities and offers a snapshot of activity across three key elements: citizen connection, governance platforms and enabling infrastructure. Each city has the opportunity to incorporate CAV as part of their mobility mix, giving them the potential to become more competitive and sustainable. Each city has a different vision for CAV: Singapore has put CAV at the heart of the future of mass transit, while in contrast, Hong Kong is exploring CAV as an alternative mode of transportation as a part of its smart city vision.

Singapore: One of the world's most active CAV testing environments

In Singapore, the government's Smart Nation blueprint stresses alternative modes of mobility, and it is one of the world's most active CAV testing environments. Given Singapore's tight land and manpower limitations that currently constrain the city-state's transport system, CAV is broadly accepted by both citizens, who already widely use car sharing schemes.

The focus on CAV is for 'first and last mile connection' across regional transit systems. There is already enabling infrastructure including high quality communications and road networks. The Committee on Autonomous Road Transport for Singapore (CARTS) coordinates all CAV initiatives and plans to have self-driving buses and shuttles on public roads by 2022. They are also targeting a 10x increase in electric vehicles for car sharing and taxis by 2017-2020.

The report highlights how Singapore can accelerate and leverage sustainable, cost-effective technologies to provide safe and reliable green transportation to achieve its desired goal of a car-lite Singapore. Currently 12% of land is given over to roads and parking; this land could be ultimately repurposed to help with Singapore's land issues.

"In Singapore we are moving toward a future where the general public has an increasing acceptance of CAVs. While there are some concerns over safety and how to enable integration with other modes of transport, it's



clear that the government has a very well thought out plan on how to make CAV work for Singapore," said Tim Risbridger, Country Head, Singapore.

Hong Kong: Cautious approach presents challenges to CAV acceptance

Given that the land-scarce city is grappling with chronic congestion, overcrowded transport and poor air quality plus a lack of suitable housing for many of its citizens, the digital disruption caused by CAV could be a solution.

In Hong Kong over 12.6 million passenger trips are taken on its world-class public transportation system daily. By developing CAV routes that complement the current metro system, with a focus on 'first and last mile' connection around stations, residents can get to their homes and places of work more quickly and efficiently. As CAV requires less roadway and parking space, if its vision is realised, land can then be repurposed for residential, commercial or mixed-use projects.

In Hong Kong, the increase in the number of private vehicles in recent years remains one of the major contributors to the city's traffic congestion problem. Between 2013 to 2017, the city saw an increase of about 29% of private cars (at 552 710), making up for 90% of the increase in the total number of licensed cars of the same period. With population expected to reach a peak of 8.22 million in 2043, the city's congestion will only worsen if no action is taken soon. Other consequences of traffic congestion include road side pollution, increase in travel time and cost – elements that shape and define Hong Kong's livability.

At the moment Hong Kong is taking an extremely cautious approach to CAV and lacks specific policies. The government's Smart City blueprint mentions CAVs, but there is no legal framework in place yet with data and smart traffic management systems prioritised over CAV.

"To maximise the opportunities offered by CAV, cities must prepare now. CAV has the potential to address some of Hong Kong's urban challenges and improve the city's livability. What we do need is a framework that strives to strike a balance between the interest of transport operators, passengers and technology, while meeting Hong Kong's unique needs and ambitions," said Francis Au, Arcadis, Head of Hong Kong & Macau.

Arcadis is the leading global Design & Consultancy for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 27,000 people, active in over 70 countries that generate EUR3.2 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world. ■



Highlights from the IAA

Setting yet another record for the number of exhibitors, this year's IAA is bustling with innovative products to be explored. Stefan Pertz went to gather information on key products and technologies.



Having taken place in Hannover, Germany, from 20 to 27 September, the world's largest commercial vehicle exhibition, gathered the best and most innovative companies from around the globe to showcase their latest developments. While the show was dominated by news around electrification, there were lots of other areas to explore.

Filtered

One of the issues with conventional brakes is that they work through abrasion, which in turn creates particle dust from the brake pads. **Telma**, whose motto is "zero emission braking system", was showing an electromagnetic retarder. The electromagnetic technology guarantees unequalled instantaneous availability and full braking power provided by the Telma retarder, regardless of the vehicle's speed. These retarders remain effective even after the engine stops, or when the gearbox is in neutral.

As they dissipate the energy generated during braking directly into the atmosphere without using the engine's liquid cooling system, Telma retarders are effective in all situations, thereby ensuring that a vehicle always remains at the driver's desired speed.

With exceptional endurance, Telma retarders ensure most vehicles' braking needs. Risks associated with service braking system overheating are therefore avoided and the system remains fully operational in case of emergency.

Addressing the same problem in a different manner is **MANN+HUMMEL**. The company first presented the technology in 2017 at an early stage of the development process. Meanwhile, successful tests have confirmed its

effectiveness. The successfully completed Großglockner test in a wind tunnel simulated a drive down a mountain, demonstrating temperature resistance. Snow and water also showed no effect on the filter. The objective of capturing 80 percent of the brake dust particles has been achieved according to tests to date.

The newly developed Brake Dust Particle Filter from MANN+HUMMEL significantly reduces the brake dust emissions of vehicles so fewer brake dust particles escape into the environment. The filter is adaptable to existing installation spaces around disc brakes. The Brake Dust Particle Filter can be used for any type of drive, from electric vehicles and hybrid vehicles to classical gasoline or diesel vehicles.

Thanks to its robust housing directly next to the brake caliper, the filter acts directly at the point of production



to prevent the escape of brake dust particles into the environment, especially in city traffic with a lot of braking. The filter medium is a material resistant to temperature and corrosion that efficiently filters the different particle sizes. Catching particles directly at the point of production can also significantly reduce dirt buildup on alloy rims and the time-consuming removal of embedded brake dust.

Hengst developed a fluid management module for the Chinese engine manufacturer Weichai that is used in all engines of the WP9H and WP10H series. These engines are installed for example in the models of the Shaanxi Automobile Group and the FAW Group Qingdao. The new module from the Münster-based specialist combines numerous functions. In addition to the oil filter and oil cooler there is also an oil pressure control valve. In this new design, the valve is located downstream of the oil filter and therefore controls the pressure of the filtered oil, regardless of the differential pressure of the filter insert or other components. In addition, an oil filter service valve, a filter bypass valve, a check valve, and the heat exchanger bypass valve are integrated in the module. It is available with or without a lubricating oil centrifuge. The centrifuge removes the soot from the oil to prevent excessive wear of the bearings as a result of high soot content. An important element of the system is the central oil return channel. The oil flowing from the optional centrifuge, the service valve and the oil pressure control valve are fed back to the oil pan through a central return flow channel made of plastic. The hybrid aluminum-plastic design reduces the weight by 7 % in comparison with a version constructed using only aluminum. Other components integrated in the module are the coolant feeder, including a coolant filter and a service valve. The service interval is 60 000 km.

Surround View

Across the globe, an average of 1.3 million people lose their lives each year in incidents involving a vehicle. Today alone, a vehicle will be the main cause of an estimated 3,287 fatalities, including vulnerable road



Blue.maxx – the intelligent fuel filter concept.

Hengst showing clever filtration solutions

users (VRU). The European Union (EU) has recognised this as a public health crisis and is in the process of mandating blind spot safety legislation for all heavy-duty vehicles in the EU.

PRECO proudly debuted an enhanced PreView Side Defender solution at the IAA Commercial Vehicles fair, optimised specifically for aftermarket users. Side Defender's advanced technology has been very successful with OEMs and the updated solution will provide a powerful and affordable option with ease of installation for retrofits.

The intelligent technology in the PreView Side Defender is able to detect moving cyclists and cars in the side blind zones, while filtering out stationary objects. Equipped with a 150-degree viewing angle and a new display, the system is an expandable and flexible safety option. The enhanced system is a self-contained solution, engineered for OEM integration and now easily retrofitted in the aftermarket to meet the safety needs of fleets.

In 2016, PreView Side Defender, the industry's most advanced side object detection solution, and PreView Sentry, the most flexible, accurate, and powerful active blind spot monitoring solution were launched, further solidifying PRECO as the global leader of blind spot solutions. Both radar systems are shipped globally and are designed, engineered and manufactured by PRECO to protect heavy-duty equipment fleets, their operators, and those around them. We learned that the company is looking for distribution partners in South East Asia.

New Direction

IVECO was showcasing its full commercial offering of alternative traction vehicles on a 100% Diesel Free indoor stand, creating a Low Emission Area at the exhibition. It is also hosting a dedicated Round Table focused on "The energy transition towards a sustainable future" and workshop events in collaboration with industry experts, customers and technical partners, to discuss the energy transition and related topics.

Also present on the stand, and speaking at the press conference, is global energy supplier **Shell**, which shares IVECO's belief that de-carbonisation of the transport sector requires a range of fuels and technologies. As part of their collaboration with the brand to promote the development of the electric and natural gas refuelling networks in Germany, Shell is also displaying on the stand a CNG/LNG filling station and an electric charging station. In a conversation with representatives from Shell we learned that 95 % of all charges for electric vehicles are done at home. Hence, the discussion about power supply in the form of conventional petrol stations may need to be taken further. It is akin to the first automobiles, whose owners had to get petrol from pharmacies before an adequate infrastructure was built.

IVECO's display at the IAA 2018 shows its solution to sustainable transport, with an energy mix that matches the requirements of the different missions. It sees electric propulsion as having an important role to play, especially in high-value missions such as people



transport – particularly in low speed, low energy intensity stop-and-go missions in city centres. The other key energy source is natural gas, which provides a mature solution for sustainable transport of people and goods. Through its display and workshops, IVECO is highlighting the considerable environmental advantage of natural gas, which is able to deliver massive reductions in the most polluting emissions: 90% for NO2, 99% for particulate matter, 10% for CO2 with natural gas which rises as high as 95% with biomethane well to wheel.

Invisible Hi-Tech

An important factor in lowering emissions is the reduction of friction losses.

This is where a closely coordinated piston system comprising the piston itself, the piston rings, cylinders, piston pin and connecting rod plays a critical role. In recent years, **KS Kolbenschmidt GmbH** has repeatedly expanded its systems competence in the area of friction reduction. In the course of simulation tests and on its own inhouse friction test bench with the engine running, the whole assembly comprising the aforementioned parts is fine-tuned in terms of geometries, surface finish, shape and coating to match the required operating conditions. In this way, the various piston designs facilitate individual custom tailored solutions.

This piston manufacturer is transferring its many years of car experience to commercial vehicle applications. Thus, besides optimised-friction pistons, smooth wire-sprayed



Telma is offering emission free braking

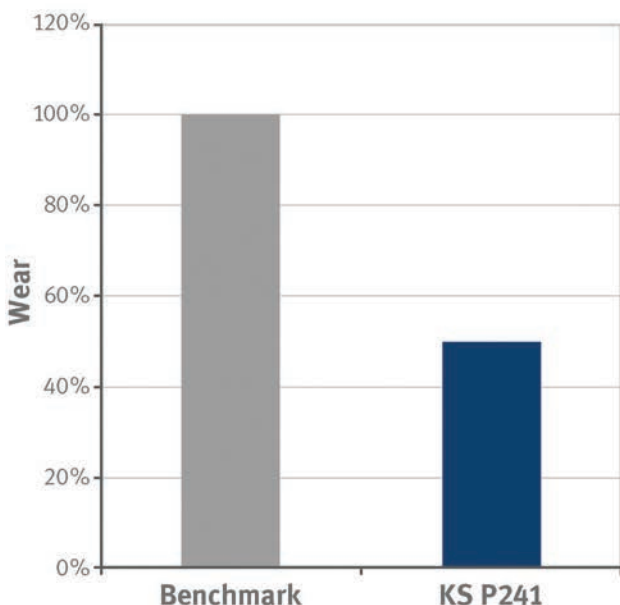
cylinder surfaces (RSW coating) have been in series production for some time now. The experience acquired has shown that wire-sprayed cylinder surfaces combined with pistons rings with a hard coating, e.g. of diamond-like carbon (DLC) result in significant friction reduction as is evident in the engine map. KS Kolbenschmidt currently offers this technology in the form of prototypes also for commercial vehicle engines.

These special, very low-friction piston rings are being developed together with alliance partner Riken. Simulations have shown that, compared with current series production, the optimised piston assembly develops around 25 percent less friction at the same low oil

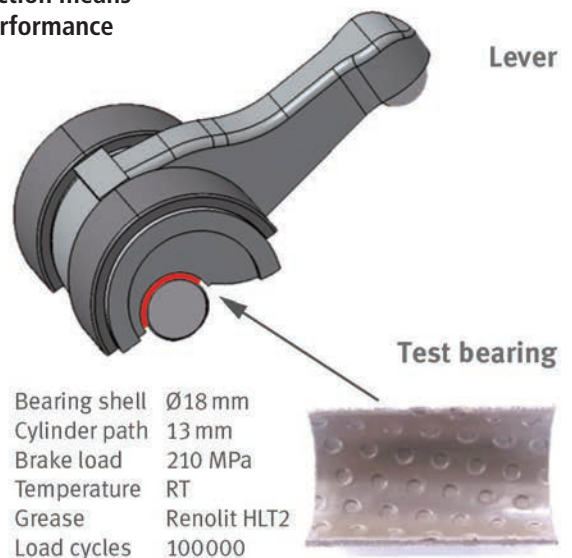
consumption. The CO2 savings have been wholly confirmed by an OEM in carrying out consumption measurements on a fully assembled engine for its concept selection model year US'21. The low-weight Weldteks piston for light commercial vehicles has also been optimised for minimum friction in terms of crosssectional characteristics and piston profile. Rounding off the package is the lowfriction Nanofriks shaft coating.

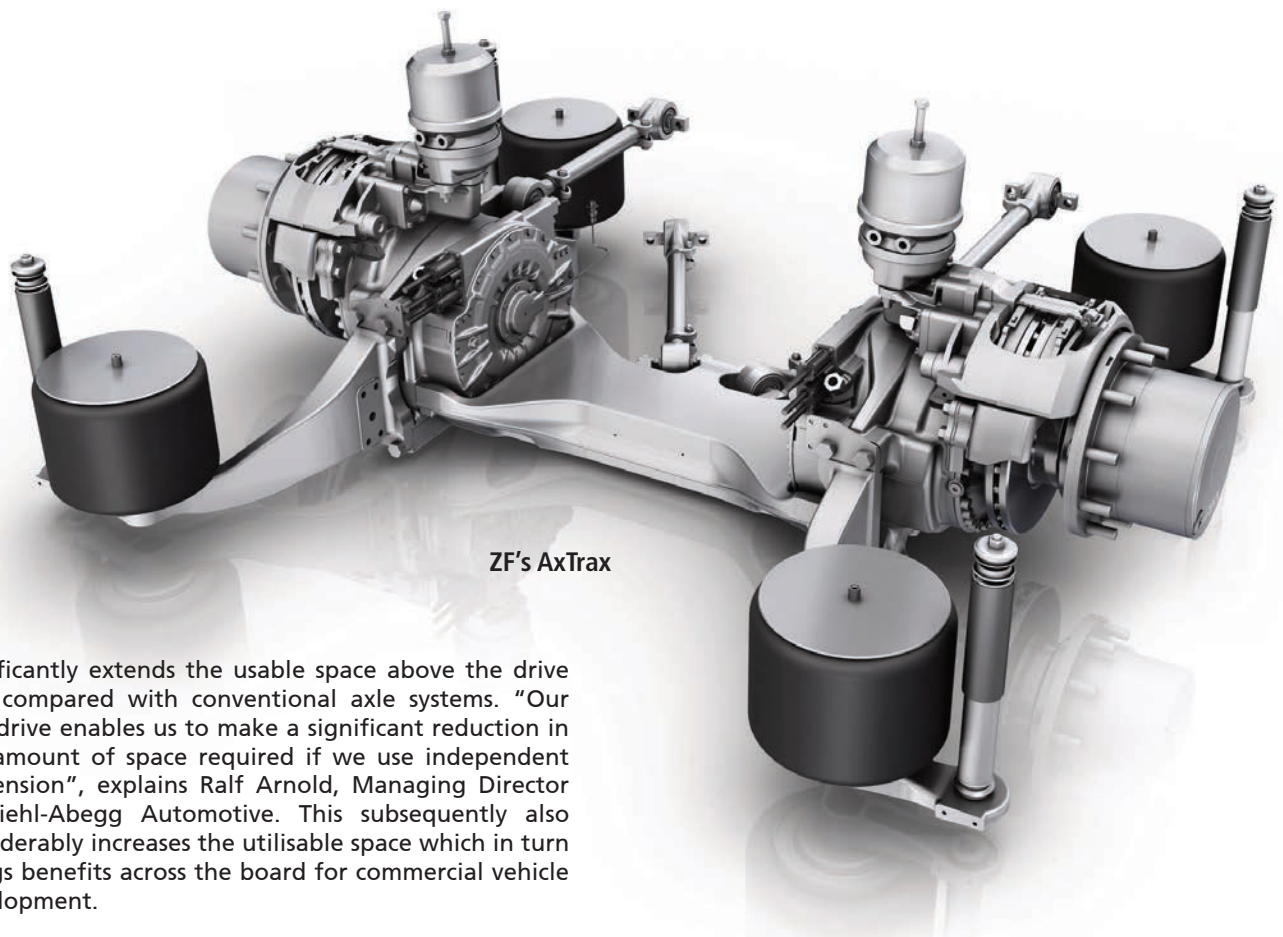
Re-invented Wheel

In addition to its application for city buses, the independent suspension has also been developed for the whole of the commercial vehicle sector. The current axle drive module from **Ziehl-Abegg** has two in-wheel hub motors and



Lower friction means better performance





ZF's AxTrax

significantly extends the usable space above the drive axle compared with conventional axle systems. "Our hub drive enables us to make a significant reduction in the amount of space required if we use independent suspension", explains Ralf Arnold, Managing Director of Ziehl-Abegg Automotive. This subsequently also considerably increases the utilisable space which in turn brings benefits across the board for commercial vehicle development.

Whilst the axle drive module is already on the market, Ziehl-Abegg sees independent suspension as a future concept. Traditionally, vehicle manufacturers rely on pneumatic systems for braking and suspension. In addition to this solution, Ziehl-Abegg is offering yet another step in the development process for a range of totally new concepts in terms of installation space: a hydraulic braking system combined with hydro-pneumatic suspension. A modular system has been developed for this purpose, enabling all the available technologies from the field of pneumatics, hydraulics and electrics to be combined in order to meet the client's wishes as far as possible.

A 'quick fix' solution for the integration of a purely hydraulic system will not be possible as this will require a complete revamp of the vehicle architecture. For example, the front axle would also have to be fitted with hydro-pneumatic suspension. When the concept is applied, space is created for the battery packs in the vehicle substructure, shifting the centre of gravity downwards. "This makes it possible to design lightweight, electrically-powered commercial vehicles and to save energy," enthuses motor expert Arnold. "I'm curious to see which commercial vehicle manufacturer will be the first to opt for this future concept."

On journeys using hydro-pneumatic independent suspension, the rolling motion on bends is completely eliminated and that is without the use of a mechanical anti roll bar. The chassis can also be raised and

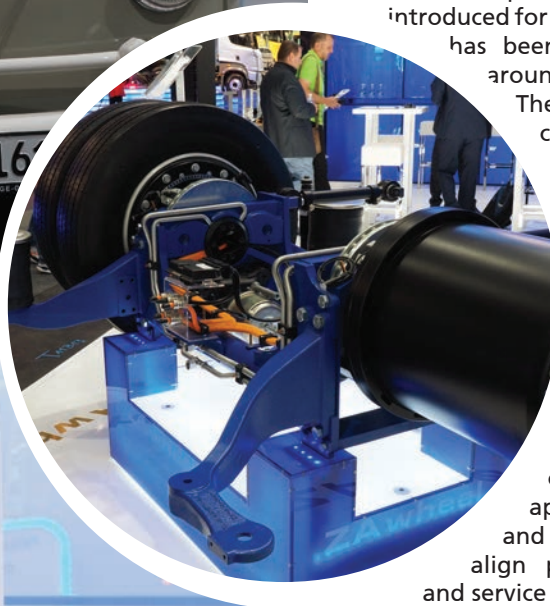
lowered completely, allowing for ultra-low-floor design vehicles. "Independent suspension is the logical further development of our ZAwheel", emphasises Arnold. "Because the significant saving in space can only be achieved with genuine in-wheel hubs." This is shown by the example of city buses: "Thanks to the width of the aisle, prams or wheelchairs can use the whole length of the bus", underlines Arnold. Up to now, space for prams and wheelchairs has only been available in the boarding areas in the middle of the buses.

The Spanish sightseeing bus manufacturer UNVI has been offering new vehicles with the silent, in-wheel hub drive, ZAwheel, for almost a year now. The first examples of the double-decker buses are already operating in Paris and Amsterdam and will soon also be seen on the streets of London. Other cities will follow. Incidentally, the French national football team held its triumphal procession through Paris in a UNVI bus: silently powered by in-wheel hub drives from Ziehl-Abegg.

Like most major cities, Great Britain's capital, London, suffers from poor air quality. Public transport systems can play a key role in fighting air pollution, which is why Transport for London (TfL), London's public transport authority, is fully focused on e-mobility. The Metrodecker EV, flagship of Optare's bus portfolio, highlights this focus. Thirty-one new model buses will be equipped with the AxTrax AVE – ZF's powerful and quiet drive with zero local emissions. The potential remains huge as London plans all buses in the city center to be electrically powered by 2037.



Ziehl-Abegg re-invents the wheel



The next generation Shell station

ZF and the vehicle manufacturer New Flyer of America, Inc. have cooperated for over 20 years to build powerful and efficient buses. A new order in the U.S. demonstrates just how much both companies have benefited from this collaboration in the age of electromobility. A total of 100 buses from the Xcelior CHARGE™ model series will be delivered to public transport companies in several U.S. cities by 2020. These include the Los Angeles County Metropolitan Transportation Authority, King County Metro Transit in Seattle, Massachusetts Bay Transportation Authority in Boston and Metro Transit in Minneapolis.

Efficient and proven The AxTrax AVE was introduced for the first time in 2012 and has been successfully deployed around the world ever since.

The electric drive axle can be combined with hybrid as well as fuel cell configurations or be powered by a battery. Due to the flat design, manufacturers have a great deal of freedom when it comes to designing the interior. As a system supplier, ZF can also deliver the appropriate hardware and software to optimally align performance, efficiency and service life of the drive.

On Solid Ground

This year, **Brianza Plastica** was introducing the new Elyplan Anti-slip, rolls and sheets produced by continuous lamination, represent the ideal solution for interior floors to prevent slipping of vehicle loads and people. The product ensures an excellent value of slipperiness resistance, thanks to the addition of a special mineral granulate (R13 class tested according to the DIN51130:2014-02 norm).

Using this laminate, moving around and standing in buses will be made easier and safer. The product has passed the abrasion resistance test accordingly to the D4060-ISO 9352 norm, ensuring long lifespan. Available in different thicknesses, on request with or without woven roving. The standard colour is grey, however other colours are available upon request. ■

Can Technologies Kill Fatal Accidents?

Murali Thalor, Editor of AutoPartsAsia, finds the number of road fatalities alarming and looks into technological solutions that can help reduce the number of lives lost in traffic.

Fatal accidents are a major problem in every country. However, it is more in countries like India where road accidents are the biggest cause of unnatural deaths. Of the millions that drive daily on the roads, 400 never come back home. Even many pedestrians are killed.

In order to create awareness on fatal accidents, DRIVE SMART DRIVE SAFE, an NGO in India, has launched a unique project titled '1Crore Steps for Safer Roads'. It is a 3,600 km walk from Kanyakumari to Kashmir in India, in 60 days by Subramanian 'Subu' Narayanan, an employee of Hella India. He started from Kanyakumari on July 28 and will reach Kashmir on October 2, 2018, covering over 20 cities across South, West and North India.

The programme is supported by The Ministry of Road Transport and Highways, NGO Arrivesafe, Automotive Component Manufacturers Association of India (ACMA), Society of Indian Automobile Manufacturers (SIAM), Federation of Indian Chambers of Commerce and Industry (FICCI), Confederation of Indian Industry (CII) and partnered by Hella, WABCO and Brakes India.

It is necessary to look at the reasons for the road fatalities. Globally, research on traffic accidents and collisions, has shown that it is rarely down to technical failure of the vehicle. About 90 percent of accidents are caused by human errors, delayed reaction, driver fatigue and poor visibility. The introductions of additional mirrors, camera systems and mandatory blind spot legislation in recent years have helped to make roads safer. Still, collisions with other vehicles and objects, and accidents that cause death and injury remain high.

Buses, delivery vans and garbage trucks, often have to operate in confined spaces making them more prone to accidents. Mirrors cannot provide all-round views. Ultrasonic sensor systems can help drivers tackle the situation by detecting objects and people in blind spots. These sensors are designed to fit on the front, front corners, sides and rear of the vehicle. They give a greater range of detection and provide 'extra-eyes' for the driver. These sensors operate using ultrasonic waves and they will scan the area around a vehicle and detect objects, moving or stationary, and alert the driver.

Brigade Electronics, a market leader of safety device has come out with Ultrasonic Detection Systems that can be fully integrated with a camera monitor system and on-





screen display module. According to the company, up to two ultrasonic detection systems can work in conjunction with a camera monitor system and an on-screen display module mounted in the driver's cab and warn the driver of obstacles by overlaying three-stage audible and visual ultrasonic data onto the camera image on the monitor. The on-screen display provides a single point of reference, together with triggered camera views to reduce driver distraction and minimise data overload.

Future Technologies

For the future technologies, including electric vehicles, raw materials like lithium-ion and cobalt for making batteries can create problems owing to their present limited supply and potential scarcity in the long-run. According to the data compiled by TechSci Research, the market for lithium-ion battery is projected to grow at a CAGR of 17 percent during 2016 to 2021 owing their properties of high energy density, rechargability and environment friendliness. The growing demand for the batteries can be attributed to the increased production of portable and stationary energy storage devices, and consumer electronics. With the rise in electric vehicles, the market is projected to see big growth.

Cobalt production is expected to exceed 100 kilo ton this year while growing at a CAGR of 11.6 percent over the next 10 years. According to CRU Group, a privately-owned business intelligence company, the way cobalt is traded and produced will change due to a shift from metallic products to chemical products. Cobalt is predominately used in super-alloys, stainless steels and other metallic applications. However, cobalt chemicals are beginning to take over the metallic segment due to the rising demand for lithium-ion batteries.

Vehicles of the Future

The growth of advanced automotive technology has led to the rise of companies such as Foresight Autonomous Holdings Ltd, an innovator in advanced vision sensor systems for assisted driving, semi and fully autonomous vehicles. Tesla Inc., is pairing sensor technology with electric motor vehicles and has recently found a foothold in China. General Motors will start mass production of self-driving vehicles next year and has been pushing its latest electric SUV to the Chinese market. Apple Inc., is developing a sophisticated self-driving system that fuses multiple sensor inputs. And Intel Corporation has joined the sector by acquiring Mobileye, bringing its technological clout to sensor technology.

Two important trends in car design are the shift toward electric and autonomous vehicles. The self-driving cars will save travelers from the hardships of driving, reduce accidents and make traffic more efficient. For years, these two developments existed in parallel. Now they are coming together. As long as the disruptive technologies help reduce fatal accidents, they are welcome. ■

Meet my Neighbors in Mongolia



Having travelled for several months, the Unimog of Petra Trueltzsch-Wiest and Joachim Wiest makes an unexpected stop in Ulaanbaatar, Mongolia, as a short circuit in the cable tree has taken out some vital functions. Stefan Pertz, Editor of Asian Buses, had the chance to have a chat with the couple to learn about how they prepared the vehicle and themselves for the tour and what they have planned for the rest of their time in the far East.

Connections Made

As it turns out, the Unimog, turned campervan has its origins near Pertz' hometown as well and the travellers connect instantly as they share the same background and passion for travel and big vehicles. "We have been to Iceland, Scandinavia and Kola with our trusted vehicle. And this time we made a dream come true by going all the way to Mongolia," says Wiest while he is supervising the repairs done to his vehicle parked in the service center of MSM Group. Having had problems with the Unimog, Wiest called ahead to MSM Group, where Mark Gabel, another German, arranged for a quick service so that the travellers could be on the road again in no time.

While attending the 20th Anniversary of MSM Group, Stefan Pertz also met with a couple that has taken a converted Unimog to Mongolia on one of their annual long-distance trips. While learning about the vehicle, he also finds out that they come from the same area in Germany.

Clever Chassis

The Unimog 4000, a 2006 model, was purchased with only 345 kilometres on the clock from the Unimog Henne and modified by

Wiest with the help of a number of camper van and Unimog experts. For instance, he fitted a water filter before the water tank. He explains that "I have never understood why the filter would be after the tank. You fill contaminated water in the tank and it causes the tank to be dirty. There is no way to clean the tank and eventually, you will have to replace it. Placing the filter in front of the tank avoids contamination and to me, that makes more sense." Wiest opted for an engine that is EURO 3 classified as there are less issues with Diesel quality in the parts of the world he is travelling to.



Fully Decked Out

The vehicle features solar panels, septic tank, two Diesel tanks with 220 litres capacity each and a 200 litre fresh water tank. The cabin is made from aluminium sandwich panels, offering outstanding insulation, which helps reduce the need to heat the cabin or to cool it down. What makes the base vehicle interesting is that it was originally used by the German army for mapping of terrain. A lot of cabinets, made from steel, were already installed and Wiest only had to install beds, bath room and a dining area to make it a liveable vehicle. "The wheelbase of 3.85 meters is good as it offers a very stable ride, which is crucial in regions where there is no proper road. Many people travelling like us don't use maps, but GPS and you never know what the conditions of the surface will be." A lot of



thinking has gone into the construction of the vehicle and Wiest has built in a lot of redundancies.

Tricky Travelling

Travelling with the couple is Nori, their dog. According to them, there hasn't been any issue bringing the dog into the many countries they have crossed in order to reach Mongolia. All that is needed is proper certification and a fully vaccinated dog. In contrast, driving into certain countries may prove a bit more difficult. The route was planned in a way that it avoids entering China as that would have required the couple to have local driving licenses. The exact route can be tracked on their website www.jp-unimobil.de Spending time off the beaten track also means one runs the risk of getting stuck. The couple met quite a few adventurous people that thought their 4x4 could handle off-road, just to find that their vehicles were rather heavy and sunk into muddy ground. "Naturally, we help as we would want others to help us if the same were to happen to us. The last group we helped actually met up with us here in Ulaanbaatar and we had a great time."

Parting Words

Having completed the repairs, the trio hit the road again and headed to the Na Damm festival, Mongolia's biggest

annual festival. An email, forwarded from Mark Gabel read "we just left your premises, everything is working, my wife and I we are totally happy with the service, how professional the work was carried out; failure analysis and so on. We hereby want to say thank you and of course we will recommend your company, whenever we get Infos about problems in our community."

The Unimog and its crew is expected to be back in Germany, to be prepared for the next tour, by October 1st, at which time you already hold this magazine in your hands.

Celebrating Success

While crews are busy setting up the stage, giant screens and bars for the 20th Anniversary Party (The invite explicitly stated that black ties are not permitted), we sit Laurenz Melchers, one of the founders and Chairman of MSM Group LLC down to find out his motivation to set up his company in Mongolia and how he went from daring entrepreneur to heading one of the biggest companies in the country.

Marketing Opportunity

"Mercedes would have to send a technician to Mongolia on a regular basis to service the cars. When we suggested that we could do that for them, saving the technician a lot of travels, Mercedes agreed, and we were suddenly in the workshop business," Melchers recounts. With the new economy being a big unknown, both Melchers and Mercedes took a gamble and the Mongolian Mercedes distributor was born. Also present at the event was David Reiner, who is also one of the founders of the group. David Reiner, business partner of Laurenz was always very supportive of the truck business and helped to secure the funding of the first truck fleet deal. Without his help and involvement, MSM Group would not be one of the leading companies involved in commercial vehicles in Mongolia today.

Having grown by bounds and leaps, always stretching the limit of the overdraft and re-investing all profits into the business, Melchers however, also felt the pressure from Mercedes to have a proper showroom to reflect the brand image. In 2009 the move to the current location was decided

and it was the biggest showroom in town when it officially opened in 2010.

Strong Brands

The business of dealing with commercial vehicles is described as being difficult. As a landlocked country, everything needs to be transported by road to the final destination in Ulaanbaatar or the countryside. While the country has been posting record GDP growths, the price for a German made brand is out of reach for many local companies. Melchers adds that "In addition, the market is not mature enough yet to be discussing and understanding issues like life-cycle cost." In the infant stages, vehicle financing wasn't available in the early days of MSM Group. With border crossings taking several days in some cases, hi-spec trucks would lose efficiency quickly.

"What we have is a good mix with the two brands, Mercedes and FUSO," Mark Gabel explains. While many mining and exploration companies need highly dependable trucks, distribution companies do not require all the bells and whistles that a European truck would have, and this segment is covered by the FUSO vehicles.

Return to Base

Gabel has been working with MSM Group from 2006 to 2011, coming from Daimler in Korea. "I wanted to further develop myself and to challenge my comfort zone." Taking pride in his work, he was happy to see Mercedes trucks driving around Ulaanbaatar. Coming back to MSM Group in May 2018, Gabel is now finding new conditions in the market. Requirements have changed, now that local transport companies also deliver goods to places as far away as central Europe. In his new role as CEO, he will be coaching the younger generation. "I can see that the new generation is more adaptive, and they are hungry for new knowledge."

When asked, what made MSM Group successful, Melchers pinpoints at honesty. Even though corruption was part of the system when the Russians managed the country and for a long time, this modus operandi prevailed, MSM Group has always been transparent. "Too much work to keep two sets of books," Melchers simply says. Today, MSM Group is ranked among the Top 50 Tax payers in the country. Following the milestones of being the first Mercedes distributor, having the largest showroom and being

among the biggest contributors to the economy, Melchers now aimed at putting a show on that is to be the biggest that Ulaanbaatar has ever seen. As the saying goes, nomen est omen and surely, as the company was incorporated as Mongolian Star Melchers, it must have been under the right constellation of stars. ■





Weststar Maxus Opens 3S Centre, Unveils V80 Commercial Van

Weststar Maxus opened the doors to its new 3S facility in Bukit Mertajam, Penang, on August 17. It is the northern hub to provide quality service to its customers in Perak, Penang, Kedah and Perlis. With its expanded range of product and services packaged with exciting promotional campaigns, sales are expected to increase by at least 30 percent.

At the opening ceremony, Weststar Group Executive Director, Datuk Vikram Menon said that the Group is making a leap forward to become a mainstream automobile player in Malaysia. "We now have refreshed and expanded award-winning models such as Maxus G10 and Maxus V80, and an expanding network of showrooms and after sales service facilities, to achieve our goal," he said.

He added that after-sales component is an integral part of its overall plan to grow the Weststar Maxus brand. "This facility together with our appointed service dealers in the region are able to serve our customers with well-trained technicians. Plans are afoot to operate another 3S facility in Alor Star in the foreseeable future to consolidate Weststar Maxus's presence in the Northern region," he said.

The ceremony also saw the unveiling of the 2018 Maxus V80 commercial van. The commercial van can be customised to meet individual business needs. Among its growing number of fleet customers include Eco Coach Travel and Tours, DHL, Federal Express and FFM-Massimo. A huge fleet of these vans are already being operated by various government agencies including the Malaysian Armed Forces, Ministry of Health and Dewan Bandaraya Kuala Lumpur, among others.

Offers include 150 000-km free service with a three-year warranty to commemorate the unveiling.



The Maxus V80 has a high space utilisation rate, good ground clearance, and among the best interior height among its peers. It has also passed the world's most rigid ECE automobile road tests in severe conditions including extreme low and high temperatures, and high altitudes. With the support and global resources of SAIC Automotive Co Ltd, China's largest automobile company, the Maxus V80 carries its core parts and components from world renowned component suppliers.

The Maxus V80 comes in two variants, namely the Maxus V80 window van and the Maxus V80 panel van. The Maxus V80 window van can seat up to 15 adults comfortably. With its spaciousness and generous height, any 170cm-tall adult can walk through inside the van. This window van can also be customised to seat up to nine to 12 passengers, allowing more luggage to be carried.

In view of Penang and Langkawi being primed as popular tourist destinations, the Maxus V80 window van would be an ideal people transporter for hoteliers, tour operators and hire-and-drive companies.

For the Maxus V80 panel van, versatility would be its strongest selling proposition. The panel van with its sheer size and height can be easily be configured to any business need. Presently it is popularly configured as ambulances, mobile libraries, courier van, mobile clinic, mobile offices and counters, mobile kitchen and food truck or just simply for carrying goods and services.

The Maxus V80 panel van can load goods up to 1 590 kg. With wide side door opening on both sides, it provides easy access for cargo loading and unloading. When the side doors of the panel van are fully closed, it provides customers with a wide span of branding space for them to advertise their company and services while plying the highways and motorways.

To commemorate the unveiling of the new V80, Weststar Maxus is offering 150 000-km free service with a three-year warranty and free service for all Weststar Maxus models which includes parts, labour, and lubricants.

Also, as part of its green initiative, Weststar Maxus plans to launch fully electric versions of the Maxus V80 known as EV80 soon. "This is a significant proposition for companies like Weststar Maxus seriously looking at lowering

carbon footprint while concurrently manufacturing fully functional vehicles with competitive running costs," Vikram said.

Also present at the launch was Weststar group senior vice-president Dato' Nik Hamdan Nik Hassan, who said that the opening of the new 3S facility in Bukit Mertajam was driven by the economic boom in this largely untapped market. "The Northern region is fast emerging as a dynamic industrial centre which currently hosts a sizeable number of national and multinational companies, and the industrial development zones within the NCER -- Kulim High Technology Park, Bayan Lepas Industrial Zone, Mak Mandin Industrial Park, and Batu Kawan Industrial Park, among many others.

"One of the primary reasons why we have opened this facility in Bukit Mertajam is to increase sales of our range of vehicles in a more focused manner, and also to provide quality after-sales service, working alongside with authorised independent service dealers to serve our growing number of customers in this region," he said. ■



Anders Liss New Scania Country Manager



Scania, a Swedish manufacturer of trucks and buses, has appointed Anders Liss as Singapore Country Manager and Regional Manager of South Malaysia and Singapore, writes Floyd Cowan.

Anders Liss, recently appointed Scania Country Manager for Singapore and Regional Manager of South Malaysia and Singapore, states that sustainability is a top priority for him in his new role. "I want to reinforce the leadership position on sustainability for Scania and for our customers. We can help our customers realise more value if we reduce their environmental impact. Scania is a leader in sustainability, and we are a leader in many areas. One of the challenges for me is to maintain and grow that leadership position."

Reducing Impact

The obvious way for customers to improve their environmental impact is reducing fuel consumption, but Scania's vision goes beyond that. "We are exploring alternative fuels," Anders continues. "We are developing new drive lines to be more efficient and use connectivity to improve operations."

Sustainability is not just a tool to help customers improve their operations but is an overall approach to Scania's entire business. Anders holds up a plastic water bottle. "The next time you visit," he states, "you may not see plastic bottles. We are in the midst of looking into how we can eliminate single-use plastics in the office. We are looking at all of our operations to find the best practice in sustainability."

Minimising Downtime

"What sustainability means for our customers is that we are focused on minimising the downtime of their vehicles and maximising uptime. The more efficient a truck runs, the more sustainable it is. The more time their trucks are on the road, the more money they will make. It is our job to help them make money."

Marie Sjödin Enström, Managing Director of Scania Southeast Asia states: "Anders brings a wealth of experience in Scania's sustainable transport solutions at a crucial time when Singapore is taking climate action very seriously towards ratifying the Paris Agreement. He will work very closely with customers to achieve profitability in their fleet operations while reducing the negative effects of climate change."

Extensive Experience

As Country Manager for Scania Singapore, Anders leads a local team of about 80 employees to meet the public and cargo transport needs of the country, specifically for the logistics, transportation, construction and public service sectors. As Regional Manager for Scania South Malaysia and Singapore, he has operational oversight for both markets in the areas of trucks, buses, engines, maintenance, parts, connected services, driver services and contracted services.

Anders first joined Scania in 1995, as a trainee in research and development in Södertälje, Sweden. "I've been with Scania for 23 years. I started with Scania straight from university where I had studied engineering. I worked in R&D, but I found I wanted to work with people and business, so I moved into Sales & Service."

Achieving Record Sales

Since then he has held a wide range of positions in the sales, services and marketing functions as well as international operations. His most recent position was as Vice President of Sales for Scania Engines where he has been since 2012, prior to

coming to Singapore. He was responsible for achieving record sales for industrial, power generation and marine engines. Prior to that, he was Sales Director for Scania's City and Suburban Buses.

He has extensive experience outside of his native Sweden. Internationally, he has garnered experience as Country Manager for Scania Tanzania where he was for three years between 2005 and 2008 and as Area Sales Manager in Dubai for the Scania's truck business in the Gulf region before that.

A Warm Environment

"Singapore has been most welcoming," he says after being here at time of writing, for just over a month with his wife and two children. "It is an international country that is used to seeing people come and go. The family has already settled in very well."

For Anders the challenges may be bigger, though in many ways he is taking over a smooth-running machine. Programmes that were started some years before are running smoothly, which gives him time to focus on his priorities.

Supporting Smart Nation

Anders is excited about supporting Singapore's transformation into a 'Smart Nation', saying: "Scania wants to be part of the data-driven innovation and connectivity that will shape the way people live and work in the urban environment here." One of his priorities will be to focus on connecting vehicles through the Scania Fleet Management System – which provides driver and vehicle behavioural data for driver training and driver coaching – to help fleet owners improve fuel efficiency, enhance safety and lower their environmental impact.

What allows Scania to do this efficiently is that all their vehicles are connected. "All 400,000 vehicles Scania has made around the world are connected. We get real time data from the vehicles, so we know how they are performing. We will create more uptime for any of our vehicles."

Scania Fleet Care is also high on Anders' list of priorities "We want to take over the complete management of our customers' fleets. We will set a service and repair schedule for them. Owners should imagine all their maintenance concerns being taken care of by someone whose job is to maximise the time their fleet is operational. That frees them up to do the work that makes them money. They have more time to do logistics and the things that keep their businesses running. They don't have to worry if that truck or bus is in need of service – we will do that for them."

Integrated Operations

"I look forward to working with the government and the universities. They are very progressive in Singapore." Sharing of knowledge and technology is a two-way process in Scania. "The information, the knowledge that we gain in Sweden through our R&D we will put that into practice in Singapore, but also there is a transfer the other way. If we learn something of value in Singapore, we are going to share that with our global operations."



Singapore is in the forefront of the movement to be a Smart City. It is a testbed for new technologies and concepts some of which Scania is a part of. Scania, working with the government and other local partners, is doing truck platooning trials. This is a step towards fully autonomous trucks, that is being developed on many levels.

Future Opportunities

"Autonomous trucks will be here in the future," Anders states. "But it is not going to come quickly. There is not going to be an immediate dislocation of drivers. There will be jobs for them for some time to come."

Buses are another area that Anders is responsible for, and another area where disruptive changes are taking place. "There are a lot of exciting things happening with buses with electromobility offering a cleaner way of moving people within an urban setting."

Another area that Anders can see growth happening for Scania is in engines – the area he was working in as VP for Scania Engines in Sweden before coming to Singapore. "With the marine industry here, I see a lot of potential for growth."

A Hub

"Singapore is a hub," Anders continues. "It is a logistic hub for the entire region, and this gives us many opportunities. We are living in very exciting times as the technology is giving us new tools and new challenges. We are always looking to recruit good people who will thrive in this environment, who will take advantage of the evolving conditions to grow and improve our business."

"All businesses have targets; we want to improve on what we do. To reach our targets we all have to work together as a team, as one family. From those in the workshop, to the sales team and the front office staff – we are all family," Anders states. ■

Taking a SWAT at On Demand Buses

Singapore's Land Transport Authority wants to provide riders with an efficient on demand bus service and is looking to SWAT, a startup, to develop the technology that will efficiently do that.



Singapore's Land Transport Authority wants to conduct on-demand public bus trials and is working with a start-up called Ministry of Movement (also known as SWAT) to develop the technology for this purpose. The concept is simple: use on demand bus to improve productivity of underutilized fixed route buses during off peak hours.

The Vision

Both founders of the company, Mr. Jarrold Ong and Mr. Arthur Chua shares the vision of providing a new alternative transport to the world's public commuters that is "on-demand, speed like a taxi and priced like a bus." Actualizing such a service is far from simple with many factors needing to come into play and work seamlessly together.

Moving into Mobility

Co-founder Jarrold, says, "SWAT aims to be the central command system enabling the provision of on-demand bus services." SWAT's vision is to optimise fleet deployments and commuter demand for companies with buses and systems already in place. At the beginning, established transportation companies were reluctant to get involved with a proposition that could reduce the number of buses needed.

Winning Tender

Arthur concurs: "The true testament to Goldbell's belief in the potential of SWAT is the industry interest it has generated and the fact that SWAT was awarded the contract by Land Transport Authority (LTA) in February 2018 to develop a "dynamic matching and routing algorithm" for LTA's first phase of on-demand public bus services." In this tender, SWAT beat eight other companies and big players including Grab and ST Electronics.

Exit the Driver

Jarrold points out that when Autonomous Vehicles (AVs) are fully deployed, there will be no drivers and parking. Ride-hailing companies and car-sharing companies will become undifferentiated. A central command system will orchestrate the movement of fleets by controlling how commuters are picked up and dropped off. Riders will make a booking indicating when and where they want a vehicle.

The system must automatically determine who will be picked up first and the route that the vehicle will take. It will determine the shortest distance and fastest route possible. Jarrold explains, "The driver is out of the equation, the route will be dynamic. When the vehicle starts, the route can change as new people want to be picked up, and some may decide that they don't need the ride. The driver will make no decisions."

Having human drivers is one of the limitations of the current system. "Buses can only operate in four hour shifts because that is the limit of the drivers. They need to take a break at that point."

Real World Testing

The ultimate goal would be to provide the service to commuters at all times in all areas, but the algorithm needs to be tested within focused geofences, which are bounded service areas at specific time periods. "We started by building a simulation engine with real commute data to figure out our efficiency in different areas and times of operations. Then, we turned that into the live production system and launched with real vehicles and paying customers. We've spent the last few months ironing out all the kinks that cropped up as we went from the virtual to real world."

SWAT decided that they would initially test the system during the morning rush hour – from 7:00am to 10:00pm targeting people going to work. "People tend to go to work at the same time every morning, using the same route. The evening rush hour is very different. People don't finish work at the same time every day and they might go off and do a chore, have dinner or whatever, before going home. From the first trial we gathered a great deal of data. From what we have learned we have to see what efficiencies can be gained."

The Fleet

"We are using a small fleet of 20 – 25 buses," Jarrold pointed out. The fleet is small, and the buses are also small. "We are using a Toyota 13-seater with high ceiling. Generally, we have seven to ten passengers. We want the ride to be comfortable. We had buses where people were facing each other, and all the seats were taken. It felt cramped and uncomfortable for a morning commute." Larger buses have limitations. "Some of the places that we go have very tight road networks. Larger buses would not be able to go there and make U turns in places where the smaller buses can."

The Service

"To meet the needs of the people you must offer mixed services," Jarrold notes. "Some are quite happy with the larger buses where they have to walk a bit more to get access. Others prefer to pay more and walk less. Some will book in advance and get a better price while others will suddenly decide that they want a bus."

There are many challenges to overcome. "Conditions change every day," Jarrold explained. "To optimize the service, we need to be out at all times. We need fixed routes at fixed locations along with the ability to respond to the riders on demand." ■



Socially Secured?

Globally, bus drivers make up for a big portion of the workforce. They contribute to the economy not only by moving people, but also with the taxes they pay and the contributions they make to pension funds and the like. While contributing, they may not enjoy enough benefits when they retire or in case of tragedies.

Underinsured

For instance, in Asia many people are underinsured (as opposed to us Germans, who have insurance for just about everything). Bus drivers may not see the need to have insurance. Or maybe nobody has really looked into this. In many cases, the bus captain may be the sole provider of income for a family. How will the family get by if something were to happen to the driver and he can no longer work? Thus far, I have only once seen one insurance company that makes the effort to be present at a social gathering of commercial vehicle drivers, offering a special package. If it was me, I would have a whole suite of products for drivers of such vehicles.

Unhealthy

Carrying out the duties of a bus driver is not a healthy occupation. Suffering from back pain myself, some research reveals that sitting is not good for us humans. Add to that, sleep patterns may be disrupted with nightshifts, stress, lack of exercise and the fact that healthy eating habits are not the norm resulting in a large portion of the population that is risking its health for our comfort.

My German driving licence states that I have to wear corrective eye-wear when driving. Some jobs require applicants to have a health test done before coming on board. Why is it then that we don't want healthy drivers to be responsible for the safety of some 70 passengers? I would very much like bus drivers to have regular health checks in order to ensure that they are fit for duty. And yes, I would want either employers to pay for that or the money to come out of the health care system, not the pockets of the drivers. Also, I would applaud more seminars and talks to show bus how they can lead a healthier lifestyle while on the road.

Unplanned

The term "career" is huge in school, university and when our children enter the workforce. A career is not just about gradual increments of salaries, but also about the assurance that one has a job for a long period of time, even until retirement. Currently, the only assurance that bus drivers have that they will have a job in the future is the shortage of drivers many countries experience.

However, what happens if a driver is no longer able (or willing) to drive? Where is the career path in this profession? Surely, bus captains have other skills too, but who is to guide them, steer them into a new job that may ensure their income, fulfilment and need for interactions? Automation is being hailed as one great advancement of transportation, but I doubt that anyone has addressed the question "If we have to re-train all these drivers, what do we want them to do?"

Unsecured

As you know, I am also constantly lamenting the lack of consideration for the safety of bus drivers. Being told that they just have to get their job done, they may not be trained in first aid or provided with proper safety equipment. There are commercial vehicle drivers who refuse to use safety vests and other PPE, but they need to be educated. And if they need to be reminded or reprimanded for not using PPE, so be it.

I think bus drivers deserve to be given consideration for their health and safety as the alternative would be that society has to care for people that have been injured and may no longer be able to work. It is about time that more is done to provide protection for an important segment of our society – whether they want it or not. ■



First Hankook Bus Tyre Specification for Electromotive Use

Hankook is presenting the SmartCity AU04+, its first tyre specification for electric buses. The tyre manufacturer is following increasing customer requirements for tyre solutions specifically for use on electric-powered urban buses.

Hankook is expanding its tyre portfolio in the scheduled urban/city bus sector. For the first time, the premium tyre maker is supplying a city bus tyre in the size 315/60 R 22.5 optimised for electromotive use. The SmartCity AU04+ stands out in particular due to its very low rolling resistance which helps to ease the strain on the energy storage units of electric-powered urban buses.

As these vehicles are generally heavier than conventional buses due to their energy storage units, the tyres also have an increased load index. To keep battery energy loss to a minimum, the SmartCity AU04+ also stands out on account of its very low rolling resistance. In urban stop and go traffic, bus tyres must be able to cope with a particularly heavy load and guarantee safe use at the same time; therefore,

special attention was paid to adaptation of the shoulder width and structure during development of the new electric bus tyre, in order to ensure extremely even wear. The tread of the AU04+, which has been designed as an all-year tyre, is suitable for all wintry conditions without restriction and bears the snowflake symbol (3PMSF). It goes without saying that the new city bus tyre size is equally suitable for use on city buses with conventional drive concepts.

On account of the increased vehicle weight resulting from the battery weight, the tyre not only has a stable carcass but also an increased load capacity of 154/148J (156/152F) which corresponds to a weight of 8 tonnes per axle. The standard load bearing capacity is usually 7 tonnes per axle for this size.

During development of the new bus tyre, special attention was paid to a high traction and braking performance, particularly on wet road surfaces. Dipl.-Ing. Klaus Krause, head of the European Research and Development Centre, explains: "Unlike conventional combustion engines, an electric motor is able to deliver the full torque immediately. This means

the vehicle and the tyres respond faster to speed or the changing road conditions. Consequently, more demands are made on tyres for electric-powered vehicles. The high grip level avoids irregular tyre wear without having to do without optimum mileage."

The high mileage is guaranteed by the optimised zigzag grooves which ensure higher block rigidity thanks to their modified layout, among other things. The constant starting and stopping in city traffic puts a heavy and irregular load on bus tyres. Completely in line with the safety aspect, the SmartCity AU04+ also

has a further reinforced sidewall. This protects the tyre from damage following the often unavoidable contact with the curb in city traffic: "The reinforced sidewall is particularly important for the protection of electric bus tyres, since they accelerate much more quickly on account of the system and also build up a more aggressive contact to curbstones" Klaus Krause explains.

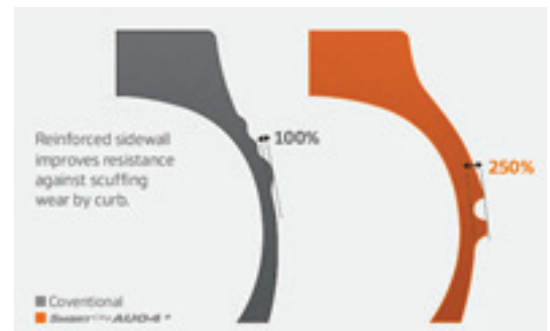
Available sizes of the AU04+ / AU03+ and AU03:

Tread	Size	LI	Marking	Snowflake	M+S	Availability
AU04+ for electromotive use	315/60R22.5	154/148J (156/152F)	C/B/W1/73db	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AU04+	315/60R22.5	154/148J (156/152F)	C/B/W1/73dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AU04+	275/70R22.5	150/148J (152/148F)	D/B/W1/67 dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AU03+	275/70R22.5	150/145J (152/148)	D/C/W1/71dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AU03	11R22.5	148/145J	C/B W1/71dB	-	<input type="checkbox"/>	<input type="checkbox"/>
	275/80R22.5	149/146J	D/C W1/71dB	-	<input type="checkbox"/>	<input type="checkbox"/>
	295/80R22.5	152/148J	C/C W1 71dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	245/70R19.5	136/134L	D/C W1 71dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	265/70R19.5	104/138M	D/C W1 71dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Technical properties of the new electric bus tyre

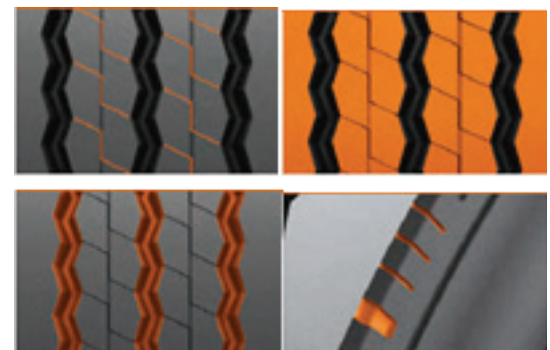
Wide shoulders and reinforced sidewalls

Wide shoulders and reinforced sidewalls ensure excellent wet grip and driving stability. New shape and position of the sidewall indicator makes determining the tyre condition easier.



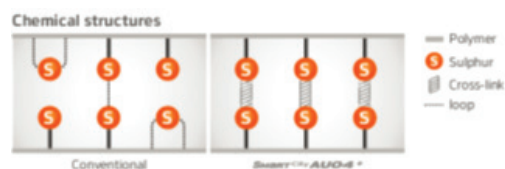
Improved tread design

Stabilising 3D tread blocks guarantee improved traction. Higher mileage through optimised rib spacing. Three zigzag grooves guarantee excellent traction, particularly in the wet. Adapted shoulder width and removed lugs and ribs ensure more even wear.



Innovative rubber compound

Improved chemical structure makes the tyre more heat-resistant.



The Finesse Behind Hengst Filters

While many may not pay much attention to their filters in a commercial vehicle, Hengst has amassed knowledge on how make and integrate them. In an exclusive tour, Stefan Pertz was allowed to see the high-tech that is needed to make filters and filter modules.



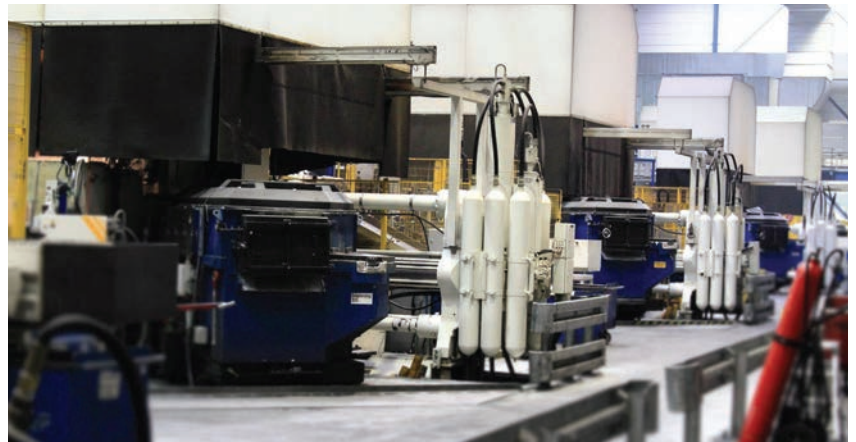
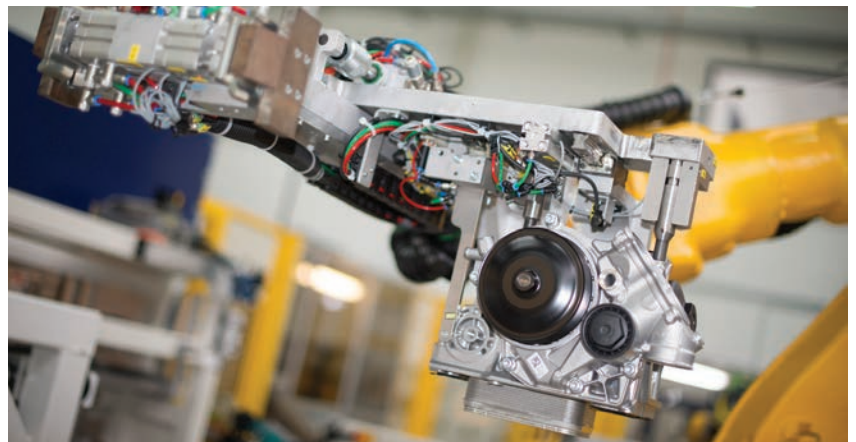
Many might think of it as their end of the career, but in his 60s, Walter Hengst was still restless and he laid the foundation to what has now become one of the most innovative and forward thinking makers of filtration products. What started with the founder taking his campervan to the headquarters of leading vehicle makers to be close to them has now evolved into a business that is present in nine countries with 16 offices and a turnover exceeding 400 Million Euro.

We wanted to know just what drives Hengst to be so innovative, winning awards from industry players as well as associations and governments and we were not disappointed in what we found. According to the people we met in Muenster, the home location of the brand, this stems from the way the founder set up the company 60 years ago. Using the then modern technology, he already innovated and created systems of working with OEMs to better suit the customer's needs. Today, Hengst SE supplies products, systems and concepts for all aspects of filtration and fluid management – from development to high-tech production. The company is a development partner and OEM supplier for the international automotive and motor industry. State-of-the-art filtration concepts from Hengst are also used widely in many other everyday and not-so-everyday applications. The agricultural sector, the navy, and manufacturers of cleaning equipment and electric tools for private or professional use rely on custom-tailored solutions from Hengst. The company's filter systems can be found in an ever-growing number of devices – from household vacuum cleaners to professional electric tools to modern robots.

There are several driving forces that are pushing innovation in Hengst. Firstly, the company aims to optimise product costs for customers. This is not done by driving the price of raw materials down, but by engineering clever filtration solutions. One example would be the way air / liquid flows are designed. If there is better flow in filtration modules, better fuel efficacy can be achieved. Another way is to design filters in ways that allow for the replacement of parts

that have reached their lifespan (filter insert) but keeping those components that are not subject to wear and tear (filter cartridge). Such approach will not only reduce the cost to replace the filter, but also vastly reduce the wastage of valuable materials. Therefore, Hengst is of the opinion that the spin-on filter concept is no longer contemporary. What might be most surprising fact is that Hengst has an enormous capability in terms of production depth.

This is expertise and knowledge is ingrained in the production of the filters. Standing amidst the filter production in the HQ is a machine that produces plastic end caps. When asked why this is done in-house, the answer from the production manager is surprisingly simple: nobody produces as many of these caps as we do and



therefore our quality and know how is better than that of any outside supplier. Besides volumes of knowledge about filtration, Hengst also has production capabilities to produce injection mould aluminium components. The foundry produces modules between 250 gram and 11 kilogrammes. In order to do so, Hengst needs to be knowledgeable about the entire process from melting to injecting the aluminium, from designing to testing. All components are being tested using very specific test protocols. It was learned that even the ambient temperature needs to be controlled for tests in order to not distort the results. Similar, Hengst also produces plastic parts needed for their filter manufacture. Again, this requires in-depth knowledge of the raw materials and their characteristics. To streamline the production, Hengst typically designs and constructs own production robots and machines in order to meet the specific needs of their product design. Given the enormous knowledge about raw materials, production methods and in-house capabilities, it is no wonder that the company is so highly innovative as everything needed is at hand. Their effort is being recognised as aluminium parts from Hengst are winning awards from bodies focused on the die-casting industry, which is not where Hengst sees itself in!

Lastly, the drive to innovate stems from the desire to produce solutions that are protectable through patents. As with many other products, filtration products

are also prone to imitation and copying. This Hengst would want to stop in infant stages as the damage of using counterfeit or knock-off product will ultimate result in damage for the end-user. In line with that, Hengst is offering training to end users to educate the market about the right use of filtration products and how to spot fakes. To top things up, the Hengst Online Catalogue has a sophisticated search function that will allow users to find parts with specific search terms that are used in various regions. For instance, in the US, parts are usually searched for by using the model year as first criteria, whereby in other countries the brand of a vehicle comes first.

Just as one might not have expected that the production of a filter or filter module requires such sophisticated production processes, one may be surprised to learn what is the most important filter in a commercial vehicle. Most of us would surely say it is the oil filter, however, it is the air filter that is the one that has the biggest impact on the performance of our engines. ■

Volvo's All-new Platform for Long-distance Coaches



Volvo's new platform for tourist and line-haul operations, introduced earlier this year, is now being unveiled for the first time to the wider public at IAA, the leading transport and mobility trade show. The range encompasses two models: the luxurious Volvo 9900 and the versatile Volvo 9700. Both feature a dynamically designed exterior with crisp lines, smooth sides and rounded corners to give low air resistance. The new "Z-shaped" side window line combined with the sloping theatre floor of the Volvo 9900 marks a totally new design language for coaches.

To give passengers a high-quality travel experience Volvo Buses has also invested heavily in comfort-enhancing solutions such as ergonomically designed passenger seats and a well-insulated interior with a low noise level. The climate system has undergone significant development to ensure a uniform and pleasant temperature throughout the bus irrespective of outside conditions.

The integrated driver's environment, featuring a new steering wheel and instrumentation, gives the driver the right preconditions for working efficiently and without disruption. Driving is made easier thanks to the vehicle's lower centre of gravity, which ensures excellent stability and manoeuvrability – properties that are improved still further with Volvo Dynamic Steering.

Volvo Buses' electromobility solution is represented at IAA by the Volvo 7900 Electric Hybrid (plug-in hybrid) and an OppCharge station for quick-charging of the vehicle's battery pack. The Volvo Buses range of electrified models also includes all-electric propulsion – the Volvo 7900 Electric – and hybrid buses. All told, Volvo Buses has served as a pioneer in electromobility and has to date sold more than 4000 electrified buses globally.




Facts, new Volvo 9900 and 9700

Volvo 9900. Height 3.85 m. Length 12/13/14 m. Axles 4x2/6x2.
Sloping theatre floor.

Volvo 9700. Height, 3.65 m. Length 12/13/14 m. Axles 4x2/6x2.

Both models can be customised by selecting from a wide range of package solutions and options.

Driveline: Volvo D11 Euro 6 with 430/460 hp, I-Shift (*I-See optimises gearchanges to suit the topography.)

Body: Newly developed corrosion-preventive structure. Sandwich construction roof gives the bus low weight and a low centre of gravity. 





Are the Disabled Satisfied with Our Bus Facilities?

Bus manufacturers and local authorities are doing all they can to make it easier for all groups of people to be mobile by providing the best services. However, is it enough for the less able individuals? And how would we, abled people, fully understand what they have to go through just to get from point A to point B?

A sian Buses sat down with Pastor Sia Siew Chin, executive director of the Beautiful Gate Foundation, an NGO for the disabled community, to get her point of view on the facilities provided for the disabled on public buses. She is a wheelchair-bound individual.

Sia, whose Foundation centre is located in Petaling Jaya, takes the free green PJ City Bus service at least twice a week to go to the Universiti Malaya Medical Centre. She said there are two types of buses; the electric bus without the wheelchair ramp and the normal bus with the ramp. However, she regretfully reported, the former had the disabled logo sticker on it, misleading the wheelchair-bound that those buses were equipped with wheelchair ramps.

“When asked, we were told by the bus drivers themselves that the electric buses do not have such ramps for us. It’s like there’s a miscommunication or misinformation on their part because the authorities insisted there were ramps on those buses, but the drivers said otherwise. They would ask us to wait for the next bus and we wouldn’t know if the next one would have ramps or not,” she said, adding that this raises the bus frequency issue. “If the bus did not have facilities for the disabled, we would have to wait longer for the next bus and that is if that one will have the features that we need.”



Meanwhile when ramps are available, they are not long enough for the wheelchairs to go up safely without assistance. "When the ramp is short, it becomes very steep when lowered to the ground, even when the bus is tilted on one side to be made lower. In this case, the drivers have to be additionally trained to attend to the disabled," Sia said. She had observed when she was in Japan, the ramps were long and attached under the bus. When the ramp is long, so is the radius therefore it is not steep and wheelchair users can push themselves up without anyone supporting them from behind.

"Our buses," she added, "the ramps are folded and are only opened manually when there are wheelchairs to board the bus." If nobody is accompanying them, they would have to depend on fellow commuters who are willing to help them board and disembark the buses.

Public buses in Malaysia generally have space big enough to fit two wheelchairs at a time. Sia said she and her friends wished there could be more space because they do travel in groups of four or five. Sometimes the drivers would allow them all onto the bus and have them occupy the aisle between the seats which might be a nuisance to other passengers. To make more space, Sia said the front bus seats could be made foldable. This should



not be too troublesome as her friends normally travel during non-peak hours when the buses are not packed to the brim with abled passengers.

Due to their condition, Sia said their fingers were also formed differently where they are not as flexible or agile, which makes even a simple act of pushing a button a difficult task. In Malaysian public buses, the stop bell buttons were designed in a way that they are a flat surface which passengers must push inwards if they wish to get off the bus. For Sia and others like her, they need a lot of strength that their fingers do not have, just to perform this simple act. Ideal stop bell buttons, she suggested, would be those that bulge out of the surface, so they can easily use their palm to push or press.

For the visually impaired, audio announcements of the next stop are needed but not provided in all buses, Sia further observed. "Being an OKU, I pay attention to all needs, not just those for my condition. There are some newer buses that have audio announcements but are inconsistent, like there was an announcement for one stop and none for the next one, while the older ones don't have them entirely," she said.

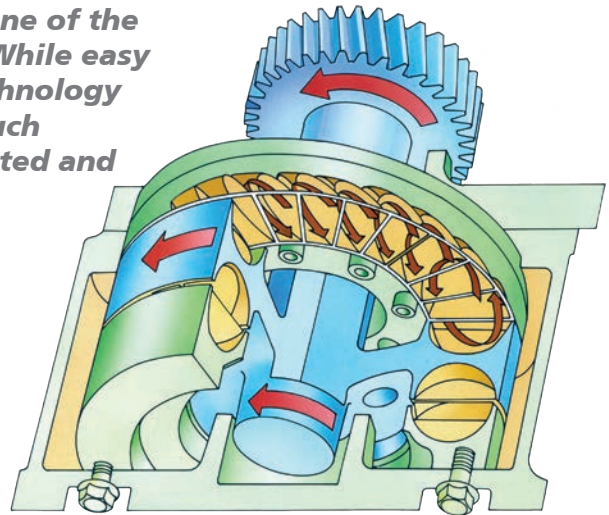
Meanwhile for the hearing-impaired, they may need ample signages or electrical announcement boards because while they cannot hear, they can read. From Sia's observations, what buses have now, the main screens are for advertisement and just tiny text lines announcing the next stops. If a deaf person gets a back seat, it must be hard for him to see.

Sia also suggested that bus manufacturers offer regular maintenance of such facilities to the local authorities who operate the services. Due to public use, the equipment is more prone to wear and tear and the manufacturers would be the best people to carry out maintenance services. ■

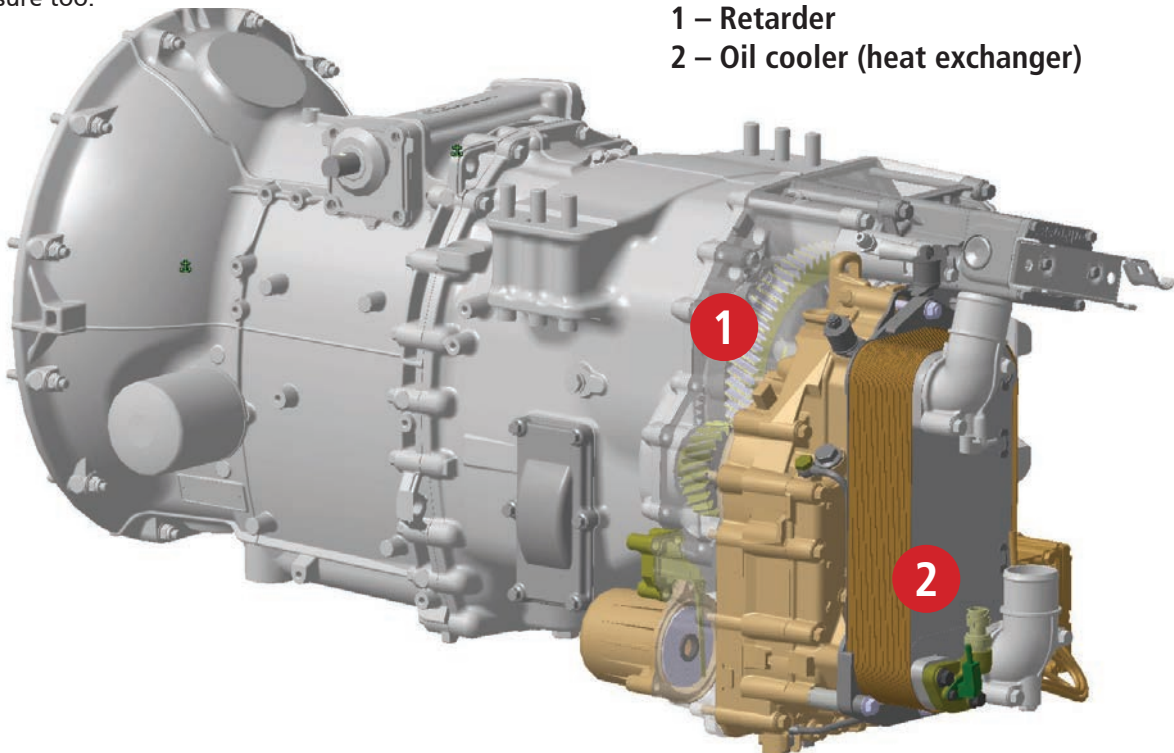
How a Retarder Works

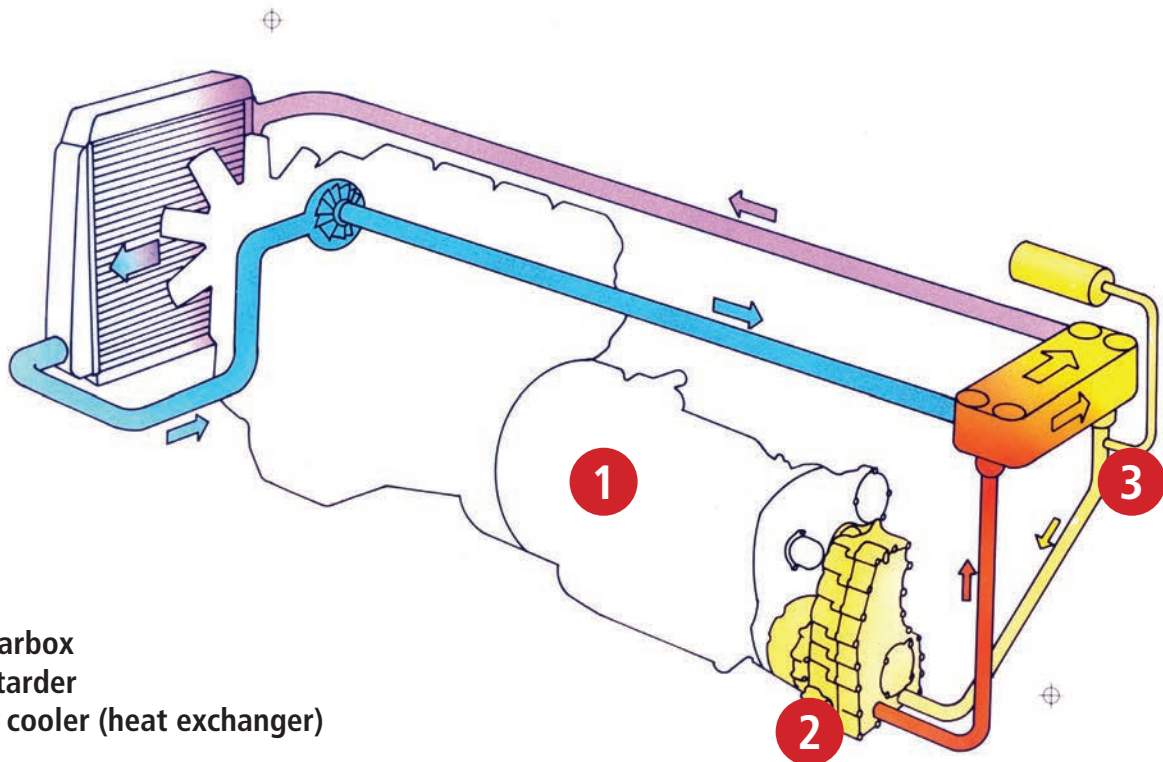
A retarder is a device used to augment or replace some of the functions of primary friction-based braking systems, usually on commercial vehicles. Retarders serve to slow vehicles or maintain a steady speed while traveling down a hill, and help prevent the vehicle from “running away” by accelerating down the hill. They are not usually capable of bringing vehicles to a standstill, as their effectiveness diminishes as vehicle speed lowers. They are usually used as an additional “assistance” to slow vehicles, with the final braking done by a conventional friction braking system. As the friction brake will be used less, particularly at higher speeds, their service life is increased, and since in those vehicles the brakes are air-actuated helps to conserve air pressure too.

Many modern buses have a retarder as one of the key features. While easy to use, the technology behind it is much more complicated and fascinating.



- 1 – Retarder
- 2 – Oil cooler (heat exchanger)

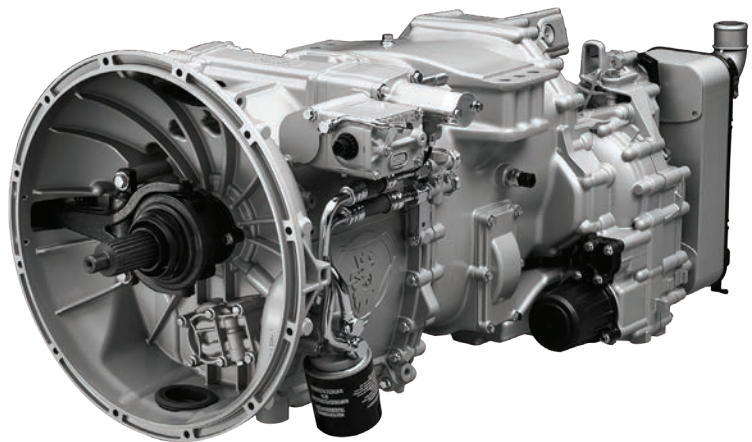




- 1 – Gearbox
- 2 – Retarder
- 3 – Oil cooler (heat exchanger)

Friction-based braking systems are susceptible to “brake fade” when used extensively for continuous periods, which can be dangerous if braking performance drops below what is required to stop the vehicle – for instance if a bus is descending a long decline. For this reason, such heavy vehicles are frequently fitted with a supplementary system that is not friction-based.

As an example, we are looking at Scania’s retarder. Scania’s retarder is available with two different torques, 4100 Nm and 3500 Nm. The more powerful R4100 is also available in a version with a clutch that disengages the retarder from the gearbox when it is not active. This minimises the retarder’s drag losses and saves fuel. This version is called freewheeling retarder and has the designation R4100D. Advantage of a retarder above exhaust or engine brakes is that it always works as long as the vehicle is in motion (>10kph). Engine/exhaust brakes do ‘disconnect’ from the wheels during gear changes giving the vehicle the opportunity to regain speed when going downhill. A retarder works as an oil pump that transfer rotating energy from



the propeller shaft in to heat by letting the oil circulate with an adjustable restriction. A higher speed of the retarder transfers more energy. Brake blending makes sure the vehicle decelerates as required while minimising the wear on the service brakes. As soon as the retarder kicks in, the service brakes will be (partly) released.

If during long downhill activation the temperature in the heat exchanger has reached a certain set maximum value, the contribution from the retarder to the deceleration reduces. Consequently, the use of the service brakes will increase. In Scania-made vehicles, the retarder setting is primarily automatic but can be manually controlled if and when the driver needs it, rather than the other way around. ■

C.A.M recently held an exclusive preview session for their new model C.A.M Co-Star. The C.A.M Co-Star is a spacious, comfortable and luxurious 20-Seater City Transporter.

C.A.M, a subsidiary of Sendok Group, is a Malaysian brand distributing light commercial vehicles. Their full range of products come with easy service and easily available spare parts for customer's peace of mind. C.A.M brand was established since 2009. Their latest addition, 20 seater microbus. It is assembled locally at R&A Commercial Vehicles Sdn Bhd, the manufacturing and assembly plant under Sendok Group.



C.A.M Co-Star

- The Co-Star utilizes Isuzu 4JB1 Engine, with German Getrag Transmission Technology and BOSCH Fuel Supply System.
- It is equipped with 2.8L Turbocharged Common Rail EURO 4 Engine giving the vehicle more power for lower fuel consumption.
- The Luxury Interior and High-Ceiling Coaster has 20 seats including driver, it has 6 meters long, 2 meters wide, and 2.6 meters high. With high ceiling and plenty of leg room, the spacious interior and wide-angle view give the driver and passenger a more spacious and relaxing journey.
- Its Non-Independent 4 Leaf Spring Suspension makes the Co-Star more comfortable to drive with. It also makes it suitable for carrying large amount of passengers while travelling on uneven road conditions.
- Its Anti-Lock Brake System (ABS) and Electronic Brake Force Distribution (EBD) assist the driver greatly while braking and driving around corners, making it safer to drive down long and curvy slopes.
- Its Strengthened Body Frame with Closed Loop Structure allows it to be very resistant to torsional forces and deformation when it is flipped over, effectively increasing the safety of passengers. Furthermore, it also has Cathodic Electrodeposition Coatings, giving it good corrosion resistance that can last for as long as 10 years.
- The Co-Star's spare parts are highly Interchangeable and accessible, especially for its key parts like the engine and gearbox, making its maintenance, servicing, and repairing costs relatively low and economic. CAM has over 60 service centers and stockists in Malaysia to cater for their customer needs.
- It is best suited to be a luxury tourist bus and business reception vehicle, and can be customized into a school bus, factory worker bus, and more.
- The target market for the luxury coaster are limousine, shuttle bus, caravans, mobile



Big Bus Tours Acquires Singapore's Duck & Hippo Group

Big Bus Tours, the world's largest operator of open-top sightseeing tours, has expanded into South East Asia with its acquisition of the Singaporean Duck & Hippo tour company. The global company has taken over the seven sub-brands previously owned by the Duck & Hippo group namely Original Tour, Hippo Bus, Singapore 7 Sightseeing, Singapore Trolley, City Sightseeing and SIA Hop On.

The launch of Big Bus Tours in Singapore on 3rd September sees the first of the rebranded buses hit the streets. The fleet will undergo livery changes to become Big Bus Singapore over the next few weeks. Existing routes remain the same and include Orchard Road, Marina Bay, China Town, MBS Shopping, Little India, Singapore Flyer, Sentosa Island and the Raffles Hotel Singapore.

Founded in Singapore by James Heng in 2002, Duck & Hippo started with two Duck buses and 10 staffs. Today, it has grown to approximately 120 staffs with a fleet of 50 vehicles. Duck & Hippo's key partners include the Singapore Tourism Board, Singapore Airlines, JTB, Ctrip, Viator, Expedia and all key attractions in the island. To date, the group has handled more than 650 000 passengers annually and is a market leader in the tourism segment.

Alex Payne, CEO of Big Bus Tours said in a statement that the "The Duck & Hippo management have ran a very successful operation since 2002 and we are keen to continue with their expertise, knowledge of the city, and relationships with key partners. They have set a high standard for tours in Asia and so we are excited for them to help us expand further into the region."

With the acquisition, Singapore will become the 21st city in the Big Bus Tours portfolio, after the most recent additions of Dublin and Los Angeles. Other cities in the portfolio include London, Paris, New York, Washington DC, Chicago, Miami, San Francisco, Las Vegas, Philadelphia, Hong Kong, Dubai, Muscat, Abu Dhabi, Rome, Budapest, Vienna, Istanbul and Sydney.

Pahang Customer Adds Scania Vehicles to Fleet

One of Scania Malaysia's key Pahang customers, PIBG Sekolah Sains Sultan Haji Ahmad Shah (SHAH Pekan), recently received keys to the vehicles they recently acquired for their business and transport requirements.

Held at the Scania Kuantan service facility, the official handover was done by Scania Southeast Asia Sales Director, Daniel Tan.

SHAH Pekan's Yang Dipertua Persatuan Ibu Bapa & Guru Tuan Haji Mohamad Alias bin Chik cited performance, reliability, fuel economy and safety as some of the reasons as to why Scania was the ideal choice for their operations and total operating economy.

Complementing those reasons, he added, was the excellent Scania after sales service and maintenance that also contributes to their uptime. SHAH Pekan chose to acquire a Scania K310IB4x2 bus because safety and comfort is a priority for its students.



The bus features a powerful engine with higher torque at lower revs and is equipped with the Scania Opticruise gear-change that promises better comfort and fuel economy while reducing clutch and synchromesh wear.

The vehicles that were handed over also come with the standard package of the two-year free Scania Maintenance; two-year free 24/7 Scania Assistance and a ten-year free Fleet Management System (FMS) package that will help both customers monitor vehicle and driver performance, particularly fuel consumption that will assist them in making informed decisions. ■

Alexander Dennis opens new Asia Pacific facility in Singapore

Alexander Dennis has opened a new facility in Singapore to support its continued growth across Asia Pacific. The new site includes a parts distribution and training centre for the wider South East Asian region in addition to offices for the local team working with customers and stakeholders in Singapore.

Alexander Dennis, the world's largest manufacturer of double deck buses, has used its established presence as market leader in Hong Kong as a springboard to expand into new markets in South East Asia, breaking into Singapore in 2014 and Malaysia in 2015. Providing best-in-class aftermarket support is a core part of the organisation's plans for further growth in Asia Pacific.

The new 25 000 square foot facility, in the north of Singapore close to the Woodlands border crossing to Malaysia, has a parts warehouse, inside bus workshop, as well as a state-of-the-art training room and offices. It is designed to support contract requirements defined by Singapore's Land Transport Authority.

Alexander Dennis's parts business in Singapore has grown significantly over the last couple of years and this new facility will serve as a hub to the South East Asian customer base. ■



Motorservice sets up subsidiary in Singapore



As of July 1, 2018, Rheinmetall Automotive AG's Aftermarket division is setting up MS Motorservice Trading (Asia) Pte. Ltd., and thus shoring its presence in the Southeast Asian market. Operating in over 130 countries worldwide, this parts specialist is exploiting the strategically favorable location of the megacity to expand its independent aftermarket (IAM) activities within the region. As from mid-2019, Motorservice will extend its operations to other countries besides Singapore and Malaysia.

"ASEAN is an extremely important growth region for us. And this is why we want to be even closer to our customers through our Singapore location so that we can operate on a more attentive, more personal basis," explains Dr. Oliver Lazar, Sales Director of the new company. In pursuit of

this strategy, the city-state in the heart of the region offers ideal conditions. In opting for Singapore, Motorservice as a service-oriented company again emphasizes its strategy of doing business close to the key markets. In fact, the aftermarket trader already has a firm international footing, with locations in Germany, Brazil, China, the Czech Republic, France, Italy, Spain, and Turkey.

About Motorservice

The Motorservice Group is the marketing organization for the global aftermarket business of Rheinmetall Automotive. It is a leading supplier of engine components for the independent aftermarket, and its line-up includes the Kolbenschmidt, Pierburg, BF and TRW Engine Components brands. A broad and deep range of products allows customers to source engine parts from a single supplier. As a problem-solver addressing the needs of retailers and workshops, Motorservice offers an extensive service package and the technical expertise acquired as a subsidiary of a major autoindustry supplier. ■

S M A R T
Fleet Management Solution

A Vehicle CCTV Surveillance System

B Remote Vehicle Diagnostics Maintenance & Analytical Functions (ADAS)

C Driver Behaviour Analysis Management

3G
4G



Blue.maxx

Work smarter.

Blue.maxx – the smart fuel filtration system.

Fuel-purity requirements are constantly on the rise, meaning Hengst consistently relies on multi-stage systems comprising pre-filters and main filters. These systems are designed in such a way that alternating intervals are achieved simultaneously. This means that both filters can be used to their full potential – the groundbreaking performance data for pollutant and water separation speaks for itself!

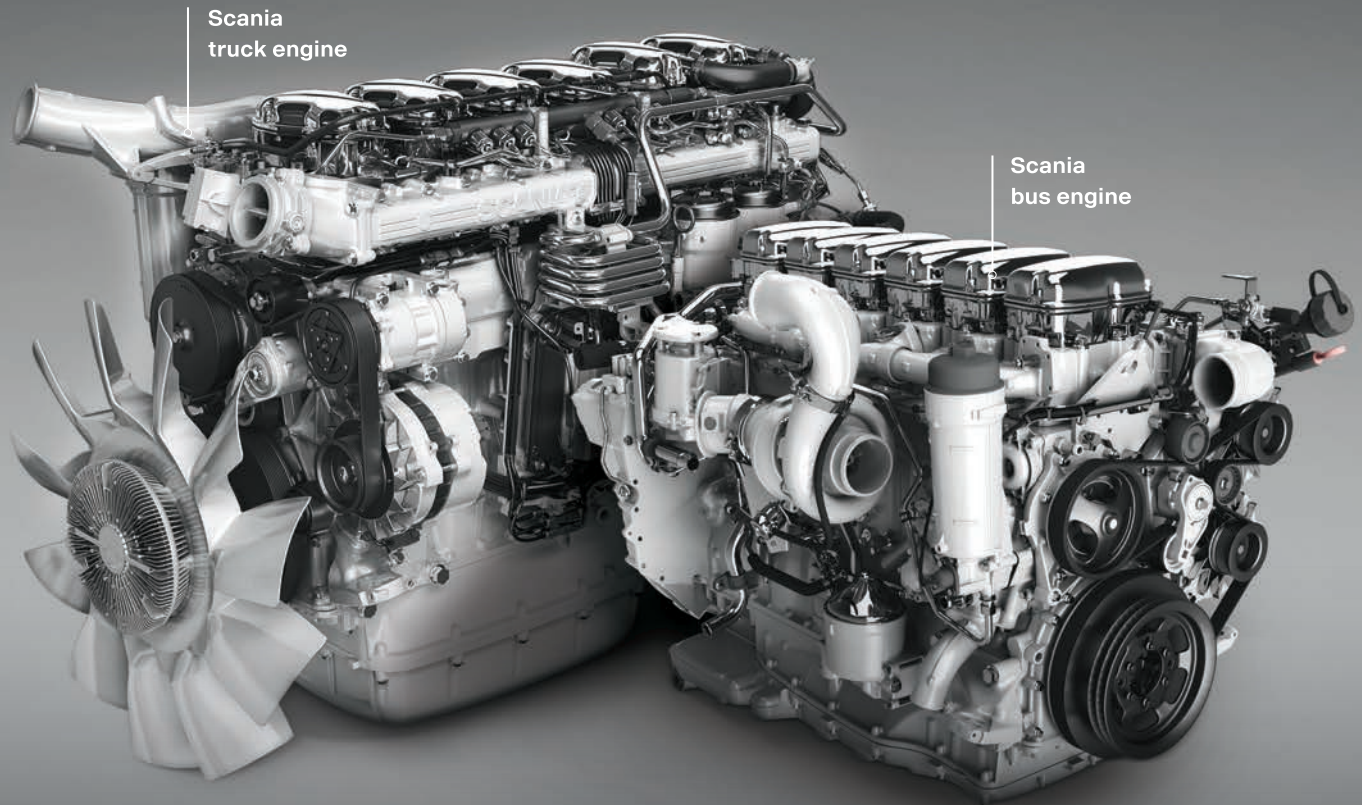
Hengst Asia Pacific

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SCANIA KNOWS ENGINE OVERHAULS CAN BE MORE AFFORDABLE



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- Up to 50% discount on labour
- Free one-time Health Check worth RM500
- Free Scania umbrella

Packages/Models	Top Overhaul	Top Bottom Overhaul	Fuel System	Recondition Package
Package price* (RM)	18,888	39,999	13,888	25,999
Eligible Scania models	P380, R420, P410 trucks, and K380, K420, K410 buses.			

- Campaign runs from 1st September 2018 to 31st January 2019.
- Applies to only selected Scania vehicles 5 years and above or with 900,000km mileage, whichever comes first.
- For more info on the list of part packages, please refer to our authorized branches.

*Package excludes government service tax.

This is sustainable transport solutions for your best profitability. Call **+603 7845 1000**, email smyenquiries@scania.com or visit www.scania.com.my to find out more.

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