



Mercedes-Benz  
Commercial Vehicles



Into the  
**future**  
with technology

# Foreword

## Looking ahead



*Kobus Van Zyl*

**A**s a truck manufacturer with global influence, our responsibility to our customers lies not only in ensuring that today's needs are being met but also in ensuring that we are looking ahead and preparing for tomorrow's world. This is not an easy task as so many variables and uncertainties have to be taken into consideration. However, it is a

task which we relish knowing that if we were to concentrate only on today, that would topple us from our platform of global leadership tomorrow.

Looking ahead is exciting but also scary. It is not for the faint-hearted as it often puts one in the position where you are regarded as a foolish dreamer. However, those visionary and brave early explorers of space travel must have faced the same kind of scorn from certain quarters. Think, however, what today's world would be like if they had let such scorn throw them off course.

For one, you would not be able to watch the FA Cup Final or the US Masters from the comfort of your lounge via satellite television

- live as such events were happening. There would be no Global Positioning System (GPS) to guide aircraft, ships and even trucks on their way. There would be no satellite telephones to summon medical help to those operating in desolate areas. No, the visions of those early explorers were not foolish. What would have been folly would have been for them to ignore their visions and aspirations for by so doing, they would have ignored the future. Preparing for the future is not an easy task. It is also not a cheap task. However, it is one which we at DaimlerChrysler embrace with enthusiasm as we pave the way with innovation and technology for a future that will not only contribute to improving

the safety of our truck drivers and the profitability of our customers but also the sustainability of our fragile planet.

In this special supplement, some of the innovations and technologies being researched by DaimlerChrysler are spelt out so as to give our current and potential customers an idea of how we are preparing for your - and our - future. The future is always exciting so long as you are up to meeting the challenges and changing circumstances that come with it.

At DaimlerChrysler, we are prepared.

**Kobus Van Zyl**  
Divisional Manager,  
Mercedes-Benz Commercial Vehicles

## Best practice and best fit for our market



*Dr Harry Teifel*

**T**echnology is wonderful and has a definite place for us in the Developing World. However, with the constraints of a Developing World environment, it is imperative that we apply the principle of 'applicable technology' and that we don't adopt every new technological innovation merely because it is there. In some ways, this means that we have to compromise on what is available to us but we do so in our quest to supply our customers with what is applicable to make their operations more effective and profitable. I must

stress that the word 'compromise' does not imply that we are depriving our customers of the latest innovations. Rather, we are applying best practice principles applicable to the market in which we operate while at the same time seeking continuous improvements for our customers.

We also have to ensure that not only are the up-front benefits tangible and real, but that the long term practicalities of that technology are also taken into account. No matter how 'high tech' the innovation may be, the truth is that at the end of the day, there has to be a technician available and trained to fix it when it may go wrong. And that technician has to have the right equipment and training to enable him or her to do so; likewise there is a similar aspect to consider in terms of the average level of training of a South African driver and the environment in which the vehicle operates.

Having said all this, we at Mercedes-Benz see it as our duty to keep our eyes firmly glued on technological developments that enhance not only our customers' operations but also the environment around us. It would be remiss of us to ignore those developments. By doing so, we would be tacitly encouraging South Africa to lag on this front.

Technology which enhances safety is another area where we keep our fingers firmly on the pulse of developments. South Africa has a dismal road safety record and if we - as Mercedes-Benz, can play our part by putting 'safer' trucks on our roads, we feel we are upholding our corporate responsibility to the citizens of this country. Technologies which do this should be embraced by all operators.

Given this as background, we at Mercedes-Benz Commercial

Vehicles in South Africa are fortunate to be able to draw on the best the world has to offer by being part of what is, without doubt, one of the most extensive global networks in the trucking World. One could accurately say that the world is our laboratory and we have access to everything that goes on inside that laboratory.

In this supplement, we introduce you to some of the technologies available from Mercedes-Benz both now and in the future. There are many more innovations being developed - many of which will be applicable to our country. Our customers can rest assured in the confidence that we will always stay at the forefront of innovation and we will continue to bring new innovations, for the benefit of our customers.

**Dr Harry Teifel**  
Marketing Manager  
Mercedes-Benz Commercial Vehicles

# Preparing for the future

A culture that never sleeps



Since the 19th Century launch of the first motorized Daimler truck in 1896, the Group has a proud history of bold innovation that still leads the way in trucking safety, economy, driver enhancement and environmental care.

As we speed into the 21st Century, DaimlerChrysler is awarded around 2 000 patents per year and invests approximately €15-million (around R120 million) per day in research and development (R&D). The digital age, instant global reach through satellite communications and advanced data management within DaimlerChrysler have all made it possible to innovate and test in different parts of the globe 24

hours a day, 7 days a week. It's a process and culture that never sleeps. With numerous truck brands able to co-operate across several continents, there are almost endless stimulating possibilities for DaimlerChrysler R&D teams. No time is wasted in grasping these opportunities, culminating in production-ready products tailored to specific market needs and requirements.

As the largest truck manufacturer in the world for all trucks over

6 ton GVM, DaimlerChrysler makes a total of around €1-billion (approximately R8-billion) available annually for commercial vehicle innovations that are developed around the world in the widely diverse markets of Europe, America and Asia. This spills over into Africa where extensive commercial vehicle testing uses East London as the product development base.

The Truck Product Creation (TPC) unit has 15 sites in seven

countries around the world and incorporates all the processes involved in producing all DaimlerChrysler trucks.

## Securing the future

Safety and technology are developing at a fast pace thanks to the practically unlimited resources of DaimlerChrysler, a global group in every sense of the word. But ultimately it's all about commercial vehicle customer-based innovations that save fuel and reduce the total cost of owning and operating Mercedes-Benz trucks.

Research and development allows Mercedes-Benz to prepare for a different future. Road transport in Southern Africa is a rapidly changing environment where trucks are committed to contractual tasks that see 600 000km hard work in three years in 24/7 operations. What will the litre price of diesel fuel be in three years time? How many woman drivers will enter professional road haulage in the future? How can we increase truck and trailer utilisation in an African context? These are just some of the questions that Mercedes-Benz technology is grappling with to provide reliable trucks to match market conditions in 2010 and beyond.

At the vast Papenburg test track in Germany, DaimlerChrysler provided a real future glimpse of 50 developments aimed at enhancing trucking safety, environmental protection and technology. This document presents the key highlights of these exciting developments, some of which go into series-production this year. As you read through these innovations, you will soon realise that the future is indeed an exciting and safe one for South African truck operators. □

By Dave Scott

# Safety

## A Mercedes-Benz hallmark



This little Smart car is safe in front of this Actros fitted with a Proximity Control System.



Without Night Vision Assist - limited vision.



With Night Vision Assist - so much more to see.

While Daimler-Benz AG invented the terms 'Active Safety' and 'Passive Safety' around 40 years ago, the vision of accident-free driving is a driving force behind each and every safety development at DaimlerChrysler. The Mercedes-Benz Actros truck range premiered advanced electronic management systems in 1996 and was awarded the European title of 'International Truck of The Year 2004', proof that electronic safety systems have matured into road transporters' acceptance and international acclaim.

### Emergency Braking System

Both internationally and in South Africa 'Telligent' proximity control has been successfully operating in Mercedes-Benz

heavy-duty trucks for a number of years. However, proximity control is only designed to use 20% of maximum braking power. The 'Telligent' *Emergency Braking System* not only prevents head-to-tail truck collisions but also reduces their impact. Even if emergency braking is not triggered until 15m before impact, the impact energy of a truck travelling at 50 km/h is reduced by around 95%.

The *Emergency Braking System* thus supplements the *Proximity Control System* that initiates emergency braking where there's a serious risk of a head-to-tail collision with a vehicle in front. The emergency braking system uses 3 radar beams in the *Proximity Control System* to detect moving obstacles in the

lane ahead of the truck – within a range of 7 to 150m and 3° – and continuously calculates the difference in speed between the two vehicles. If the traffic situation does not change and an accident is unavoidable, the driver first receives a visual warning – a red triangle symbol lights up – followed by an audible warning. If the risk of a collision increases, partial braking (30% braking power) is initiated to give the driver a further warning. If the driver does not react, the system automatically applies full braking power.

Electronic Stability Programme (ESP) have to intervene.

Using on-board navigation system data, the *Predictive Curve Assistant* computer constructs a model of the truck's road ahead. Once the computer has an image of the road ahead, it can define an uncritical maximum speed for the vehicle and continuously compare it with the actual road speed, the shape of the bend and the truck's side tilt. If the actual speed of the vehicle starts to approach the critical level before a bend, the driver receives two warnings well in advance, around 200 m before reaching the danger zone. The first of these is a red warning light on the dashboard. If the potential danger increases due to excessive speed, an additional warning signal sounds.

*Lane Assistant* systems with extended functions assist the driver, as does the stability control system with steering intervention and the *Predictive Curve Assistant* which guides the driver around bends at a safe speed thanks to navigation system networking.

### Predictive Curve Assistant

Most drivers will know what it feels like to enter what is perceived as a normal bend only to find that it gets tighter and tighter, revealing itself to be a 'drag curve'. While electronic stability control prevents skidding, within the bounds of physical possibility, the *Predictive Curve Assistant* ensures that nothing untoward can happen due to excessive cornering speed in the first place, such as when a driver underestimates a motorway exit turn-radius, cannot see the complete bend with the naked eye, or misjudges a laden-trailer dynamics. As a result, the vehicle can tip over into a lane of oncoming traffic in extreme cases. *Predictive Curve Assistant* prevents this type of danger before control systems such as

### Night View Assist

Visibility is a key safety aspect in night or day. To avoid dazzling oncoming traffic, conventional dipped-headlamp range is limited to around 40 to 50m. *Night View Assist* enhances this vision range considerably thus further helping to reduce accident risk when it is dark or foggy. The system does not dazzle oncoming traffic because it's based on infrared light, invisible to the human eye. Using infrared cameras, *Night View Assist* detects danger up ahead. Future cruise control systems will anticipate what lies ahead and a pedestrian detection system will initiate emergency braking if a person carelessly steps into the road. In addition to the existing headlamps, two

# Fuel economy and alternative power

## A continuous journey

**T**hanks to their excellent power/weight ratio, high torque at low engine speeds and outstanding economy, the MBE 4000 engine series has made impressive in-roads in North America where fuel economy is a critically measured component of road transport. By last year, the number of Brazilian-produced MBE 4000/OM 457 series engines sold in North America since launch in autumn 2001 had already risen to almost 20 000. A 6-cylinder, world-class, compact power pack, OM 457 LA is also installed in South Africa's new Axor and is ideal for heavy distribution work as well as national long-distance haulage with a maximum gross vehicle mass of 40 ton. Built in Mannheim, the engine has already acquired a good reputation for its favourable fuel-consumption profile and ample power delivery.

Beyond building reliable diesel powered trucks that are famous for low fuel consumption, DaimlerChrysler is hard at work researching alternative power resources that not only emit lower exhaust emissions but also reduce fuel consumption even further. Natural-gas drive is an extremely environmentally friendly and viable alternative to diesel and petrol engines. South Africa has access to abundant natural gas already piped through from the gas fields of Mozambique.

### Econic fulfils EEV requirements

Trucks operated by waste-disposal companies, the fire service and airports as well as those used as drinks vehicles or tankers are predominantly seen in densely populated zones and areas where emissions are a sensitive issue. With its low, walk-through cab and low frame, the Mercedes-Benz Econic is ideal for precisely these types of applications. Where

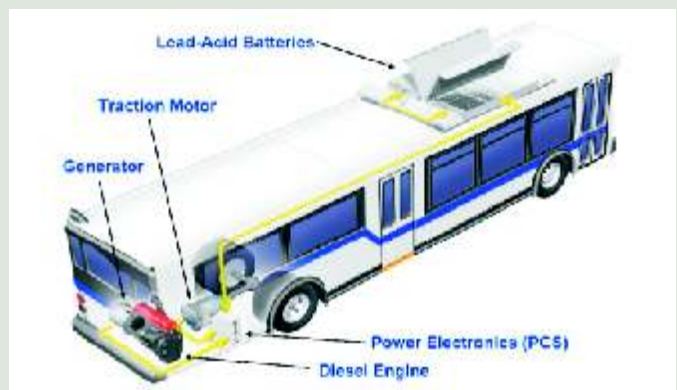
specified with natural-gas drive, Econic complies with the EEV (Enhanced Environmentally-friendly Vehicle) standard – even though it doesn't yet have to – and thus already meets the requirements of the Euro 5 emission standard that is not due to come into force until 2009. The Econic with natural-gas drive produces almost no soot and particulate emissions. A further advantage is the low-noise operation of the gas drive system. The M 906 LAG natural-gas engine has a displacement of 6.88 litres and an output of 205 kW (279hp).

### Sprinter meets EEV standards

The Mercedes-Benz Sprinter NGT (Natural Gas Technology) with mono-valent natural-gas drive – equipped with an M 111 E 23 G four-cylinder in-line engine developing 95 kW (129 hp) and sequential gas injection – easily complies with the emission standards currently in force and even fulfils the requirements of the EEV (Enhanced Environmentally-friendly Vehicle) anti-pollution standard. The gas tanks are either mounted in the cargo space or, to save room, below it, depending on the model. The Sprinter NTG has a range of up to 370 km, again depending on the model. Refuelling is via a filler neck behind the rear tank flap on the left-hand side of the vehicle. These vehicles emit around 20 percent less carbon dioxide (CO<sub>2</sub>) than their petrol-driven counterparts, and their particulate emissions are negligible. Another important factor, especially with regard to protecting the environment in urban areas, is the clear reduction in nitrogen oxide (NO<sub>x</sub>) and carbon monoxide (CO) emissions. Hydrocarbons (HC), the main cause of summer



No soot or particulate emissions from this Mercedes-Benz Econic.



The Orion Hybrid-bus is an environmental winner.



Natural Gas Technology enables the Sprinter to comply with emission standards currently in force.

smog, are also reduced. The gas industry and the authorities in Germany have launched special incentive schemes, while the law here provides for a reduction in the mineral-oil tax due on

natural gas fuel by the year 2020. This makes natural gas around 30 percent cheaper than diesel and more than 50 percent cheaper than petrol.

# Environment

## Global reach

**I**n excess of 50 million new vehicles are manufactured worldwide every year. Add this to the existing world vehicle population; combine it with the impact of vehicle manufacturing processes; include the pollution that service and maintenance by-products cause and finally round this off with the massive environmental impact of road accidents and the body repair industry – global warming is a fact. All of this fuels the debate around the extreme climatic patterns currently being experienced around the world. As a world leading vehicle manufacturer, it's no wonder that DaimlerChrysler takes a leading position on environmental care issues.

South Africa has taken the steps of aligning itself with world exhaust emission standards. By 2006, SA will be on Euro 2 and Euro 4 by 2010. DaimlerChrysler's emission control technologies will have been proved the world over and South Africa will be the beneficiary of this vast research debate and process.

### AdBlue with SCR or EGR

As already announced a year ago, Mercedes-Benz is gradually extending its range of trucks available with the new BlueTec diesel technology which is designed to ensure compliance with the Euro 4 and Euro 5 emission standards. SCR – *Selective Catalytic Reduction* – technology involves the injection of AdBlue into the exhaust-gas stream which reduces  $\text{NO}_x$  emissions, making it possible to design the engine in such a way that particulate emissions are minimised. AdBlue is added via a filler neck right next to the diesel filler neck, although there is no chance of mixing up the two. The diesel tank holds 280 litres whilst the AdBlue tank has a capacity

of 38.3 litres. Given that AdBlue consumption is about 3 - 5 percent of diesel consumption, the vehicle only requires one tank of AdBlue for every two to three tanks of diesel. Thanks to engine modifications, the BlueTec power-plants consume between 3-5% less diesel per 100 km than the previously used Euro 3 engines.

Compared to exhaust-emission levels at the beginning of the 1990s, this new technology reduces particulate and soot emissions by up to 97% and nitrogen oxide emissions by up to 86%. Even when compared with engines that meet the current Euro 3 standard, the new power-plants cut particulate and  $\text{NO}_x$  levels by 80% and 30% respectively.

Due to the differently formulated emissions limits and different customer requirements in North America, the engines in this part of the world currently differ from those in Europe in one major respect: Freightliner uses *Exhaust Gas Recirculation* – EGR – as it still usual in North America. This technology, combined with an additional particulate filter, meets the requirements of the USA future EPA 2007 emissions regulations, calling for nitrogen oxide emissions to be reduced by more than half and particulate emissions to be cut by 90%. However, in order to meet emission requirements from the year 2010 onwards, DaimlerChrysler is striving to implement SCR technology with AdBlue in North America, having introduced it in Europe a year ago, not least because of its specific benefits such as extremely low fuel consumption.

### South Africa's advantage

Africa does not have resources to match the investment required for all the research into fuel conservation and exhaust



Remember the name BlueTec - it will be part of your future. Note the separate tanks for diesel and AdBlue (bottom left)

emission control. The SA advantage lies in the time lag that precedes the introduction of this technological optional variety in

that we will be able to select technology that is most suitable for our conditions, particularly after thorough local testing. □

### From page 5

#### Orion Bus: serial hybrid drive technology is a fuel miser

The hybrid buses are based on the Orion VII, a low-entry urban regular-service bus which is 40 feet (12.2 metres). Called HybriDrive, the hybrid drive system was developed by Orion Bus together with the American technology firm BAE-Systems. The powertrain consists of a Cummins 5,9 litre, 260hp compact diesel engine that drives a 120kW alternator and always operates in the optimum range at constant rpm. In other words the Orion Bus vehicle is equipped with a serial hybrid drive system rather than a parallel one, in which both sources of power are used separately. It is possible to operate the serial hybrid bus using the zero-emission electric drive alone, at least temporarily.

Excess energy from the engine as well as the energy recuperated during braking is stored in a set of batteries with a total voltage of 600 V. The electric drive motor has a steady-state output of 184 kW and a peak output of 235 kW. Both the drive motor and the alternator are installed as a single unit at the rear, whilst the traction motor is arranged immediately behind the rear axle. The batteries are located on the roof above the front axle.

Compared to one of America's conventional diesel-driven urban buses, the Orion Bus hybrid bus reduces fuel consumption by between 25 and 35 percent, depending on the application profile, particulate emissions by 90 percent,  $\text{NO}_x$  emissions by 40 percent and CO emissions by around 30 percent. □

# Mercedes-Benz productivity

## Greater uptime and lower fixed costs

**R**oad transport economy is about maximum time utilisation. Reducing wasted time in slow docking manoeuvres creates more uptime on the road and lower fixed costs. Technology will speed up truck reversing including the skill required for complicated rear-end docking. A major reduction in accident damage to the back-end of truck and trailers will also occur.

### Truck Parking System for tight manoeuvring

When space is tight, precise heavy-truck manoeuvring is an art, requiring a great deal of driver feel and experience due to large vehicle dimensions and a high-sitting position. The *Truck Parking System* has ultrasonic sensors at the front and rear making manoeuvring easier and helps prevent costly minor damage. Yellow warning lights progressively warn a driver of the distance to obstacles immediately in front of or behind the truck, up to a maximum distance of 230 cm. Red warning lights come on if the obstacles are between 40 to 60cm away plus a warning signal sounds to alert an imminent collision.

The *Truck Parking System* is designed to make a driver's life easier but it does not relieve drivers of their responsibility to enlist the help of someone else to guide them when reversing.

### Reversing Assistant

Precise reversing of truck and trailer combinations requires a great deal of skill and experience. As well as helping to prevent accidents when manoeuvring, the *Reversing Assistant* also saves drivers of tractor and trailer combinations valuable time.

Designed to help drivers of vehicle combinations, *Reversing*



*Mercedes-Benz is also involved in using technology to make the life of the driver easier and safer in areas such as automatic hitching and unhitching of trailers.*

*Assistant* consists of a camera at the trailer rear that sends an image to a driver's cab monitor. When *Reversing Assistant* is activated, the driver guides the truck using an armrest-mounted side-stick on the driver's seat rather than by conventionally turning the steering wheel. An electric motor is used to send the commands to the steering system. Typical tasks are made much easier, such as manoeuvring on ramps, reversing around corners and precise alignment when swapping bodies.

Like the *Truck Parking System*, the *Reversing Assistant* does not relieve drivers of their ultimate responsibility for the vehicle. They must still enlist the help of another person to guide them when reversing.

### Automatic hitching and unhitching

Semi-trailer hitching and unhitching are not only

tiresome activities but also involve a certain amount of work-accident risk. For this reason, since autumn 2004, Mercedes-Benz has exclusively offered a luxury 5<sup>th</sup> wheel coupling with remote control that opens and closes at the push of a button. The semi-trailer support legs can be extended or retracted by remote control as well.

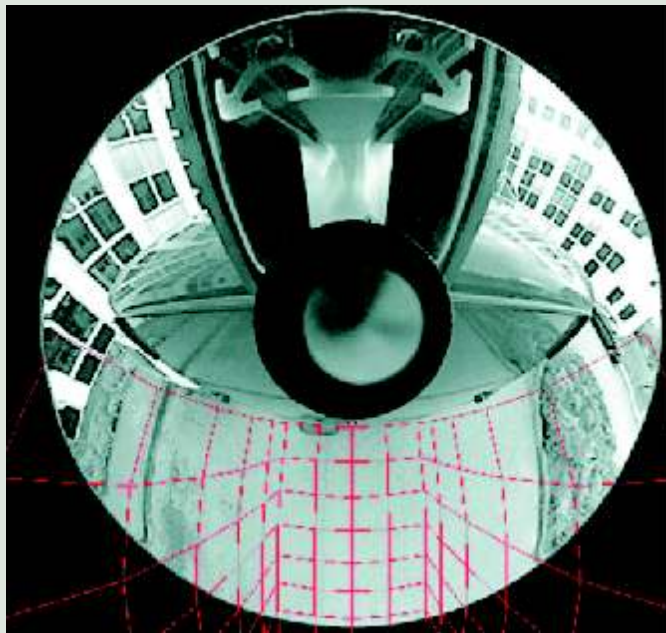
To further enhance safety and comfort, developers are currently working on an automatic fifth-wheel coupling which includes the above functions but also automatically connects the compressed air and electric/electronic lines for the semi-trailer brakes and lights. With the exception of statutory safety checks, a driver can then leave hitching and unhitching of the semi-trailer to the automatic fifth-wheel coupling. When the semi-trailer is being hitched up,

the fifth-wheel coupling is locked automatically and secured in the same movement.

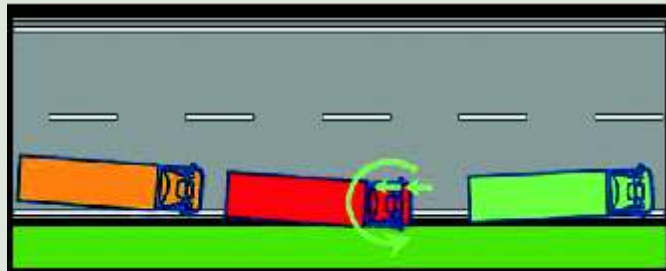
A green indicator light in the cab informs the driver that the semi-trailer has been hitched up successfully, while a red signal light comes on in the event of any errors. A single push of a button is all that is required to unlock and release the fifth-wheel coupling. The automatically extending and retracting semi-trailer supports are also linked to the clutch. For safety reasons, they can only be lowered when the parking brake is applied. An additional mechanical lock prevents the semi-trailer supports from being extended or retracted unintentionally. It should be possible to phase this coupling into production within a few years, although legal issues regarding registration will have to be clarified first. □

# Driver skills and fatigue

## Driver skill and alertness - the ultimate key



Omnicam gives a 360-degree of field of vision.



Road Departure Avoidance is an enhanced version of the Lane Assistant.

Optimum visibility is a major safety factor, particularly in short-radius applications where trucks often have to manoeuvre in tight spaces and reverse around corners in order to turn. One of the situations most fraught with danger is reversing out of an entrance, over the pavement and onto the road, especially when there is nobody to "see the driver out". The solution for this predicament is called *Omnicam*, a system which consists of a camera offering 360-degree visibility mounted in a glass cylinder high up at the truck's rear end. The accompanying monitor in the cab allows the driver to see the rear of the vehicle as well as the edges

and the area to the side of the truck's rear end. As a result, people crossing behind the truck whilst it is reversing out of an entrance can be seen – an important safety factor.

The monitor in the cab also highlights the corridor in which the vehicle is moving, assuming the driver does not alter the steering angle, thus making parking, for example, much easier as the driver can manoeuvre the van precisely into position. Thanks to the 360-degree angle of vision, the driver can also use a height line displayed on the monitor to gauge whether the vehicle will pass under low entrances or underpasses,

providing it is being driven slowly enough and forwards.

### Lane Assistant responds quickly

Alongside head-to-tail crashes, vehicles leaving their lane are one of the major causes of serious accidents involving trucks. Already successfully introduced as an option, the *Lane Assistant* is a passive assistance system emitting a warning signal to inform a driver there is a risk of the truck leaving its lane unintentionally. Based on a camera system, *Lane Assistant* detects the limit lines on the road. In an enhanced version of the Lane Assistant, the steering system intervenes, making it an active system rather than a passive one. This technology, called *Road Departure Avoidance*, is currently being developed.

If the truck starts to approach the side lane markings without the driver having indicated, the driver will feel an aligning torque tugging on the steering wheel, thus allowing him to intuitively steer back into the lane before the system's warning signal sounds. This effect is further reinforced by the fact that the torque felt on the steering wheel increases gradually as the truck gets closer to the edge of the lane.

*Road Departure Avoidance* is the name for another enhanced version of the Lane Assistant. After emitting a warning signal, this active safety system guides the truck back into its lane by applying precise braking pressure at one of the truck wheels. This function is actually based on intelligent networking between the *Lane Assistant* and electronic stability control systems. A driver still remains in ultimate control of the situation, since the system is deactivated automatically. □

*These pictures of the Omnicam in operation on a Sprinter give an idea of the usefulness of the system to a driver when reversing out of an entrance with no outside help.*



# Van safety

## The world's safest vans

Generally a van will offer excellent protection if involved in a collision with a passenger car due to a higher sitting position, high side skirts and an extremely robust floor structure. Standard equipment for Mercedes-Benz vans includes 3-point seat belts and head restraints for all seats. However, this high level of safety equipment is just one side of the coin.

Mercedes-Benz vans and MPVs up to 3,5 ton GVW are specified with an extensive active safety package – including disc brakes all round, ABS, Brake Assist, ESP and numerous other safety features – unmatched by any other van. Should an accident prove unavoidable, however, the occupants of a Mercedes-Benz Vito or Viano, for example, can also count on an extremely high level of passive safety.

A level of safety equipment, equally exemplary and unique, and standard for all models, is the Electronic Stability Program (ESP). In addition to driver and passenger safety, these vehicles ensure that the load is ideally secured, with a cargo package that leaves nothing to be desired, including a floor panel as well as lashing rails in the floor and at the sides. A load-securing concept is a key aspect for all vans with a permitted GVW of up to 3.5 tonnes. In addition to specifying features such as anchoring lugs and a partition as standard, Mercedes-Benz has developed special packages to make load securing much easier for customers. By way of example, the Vito panel van is available with a cargo package consisting of a heavy-duty wooden floor with flush-mounted load protection rails, lashing rails in the side walls and two ratchet-type load

securing straps, each with two anchoring rings.

### Body structure optimised

In the event of an accident, the body structure of Vito and Sprinter vehicles deforms in a predefined manner, absorbing the impact energy in precisely the way that the designers intended. Detailed simulation calculations are carried out to test and optimise all vehicle variants with respect to crashworthiness, strength, rigidity, bending resistance and torsional stiffness. By way of example, high-powered computers are used to virtually optimise the body structures of the Vito and to provide the highest possible level of protection in the event of a frontal, offset, side or rear impact as well as in the roof drop test and in the case of roll-over.

### Crash tests

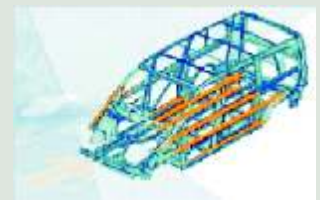
However, Mercedes-Benz vans and MPVs are subject to numerous other crash tests as well as standardised tests based on passenger car criteria, as applied by renowned consumer protection organisations, not least the partially offset frontal impact against a deformable barrier at a speed of 64 km/h. Even under these conditions, the occupants' survival space remains intact, while the driver and passengers are not exposed to excessive forces and loads. In addition, no fuel is allowed to escape to prevent a fire risk. Future model series will also be designed based on these stringent criteria.

### Active roll stabilisation

The latest vans can easily match passenger car performance but they have a much higher centre of gravity and need to carry a wide range of different loads. *Active roll stabilisation* – the future solution for ensuring even safer van handling – uses the sensors



*Actual crash tests are the final stamp of testing following computer simulations of passive safety features.*



*Simulation calculations are conducted to test all vehicles.*



*Active Roll Stabilisation ensures a van handles better and is easier to control.*

of the standard-fit Electronic Stability Program (ESP), lateral acceleration being the decisive variable. Within milliseconds, a hydraulic actuator reacts to changes in lateral acceleration, turns the anti-roll bar and thus creates an aligning torque to counteract the body roll. The same process takes place, independently, on the front axle and the rear axle. An additional lateral acceleration or roll-rate sensor also allows roll damping, which prevents dangerous vehicle body vibrations.

The noticeably lower roll angle

and the prevention of body vibrations enhance driver comfort as well as protecting the cargo, not only important in the case of fragile goods but also when it comes to vehicles such as ambulances. Active roll stabilisation also ensures that a van handles better and is easier to control as well as guaranteeing greater directional stability and – in conjunction with ESP – reduced rollover tendency. In short, active safety is enhanced substantially. □

# Testing for local conditions

## Proving technology appropriate to Africa

**T**here is no substitute for understanding local conditions and on average, a truck in South Africa works three times as hard as it would in Europe. It's an accepted fact that any technology introduced locally must have been proved appropriate to African roads, loads and drivers. Electronic systems must be robust and durable. As far back as 2000, after a few years of successfully testing commercial vehicles in East London, the South African Testing Unit was fully integrated into the DaimlerChrysler development processes. A team of mechanical and industrial engineers from DaimlerChrysler's Research and Development centre, together with a team of East London engineers are the preferred Commercial Vehicle testing resource.

Various engines from the DaimlerChrysler stable including a combination of Actros V6 and V8 engines, Axor and Atego, Sprinter, Freightliner, FUSO and Mitsubishi Canter, are thoroughly tested at these facilities. The facility houses various resources:

- Chassis Dyno (520 kW)
- Hydro pulse (10 - 40 kN)
- A fully equipped workshop
- Fully equipped machine shop
- Data capture and analysis equipment

The standard test route in East London covers a radius of 620km on various road surfaces from the plant to the Great Kei River Bridge, on to the N6 through Queenstown, up to Molteno and back. This round trip takes approximately ten hours and enables the engineers to carry out the necessary tests on the trucks for altitude, road surface and high speed.

Other resources utilised by this facility include the renowned Gerotek vehicle testing facility

with its various test tracks and inclines, The South African Bureau of Standards for Homologation testing, various laboratories for material testing and analysis, plus identified Universities for FEM's and additional calculations.

There are numerous advantages in using the DCSA East London facility including a fast turn-around time for results averaging 25 000 km per month per truck, including the acceleration-wear factor running in ambient temperatures of up to 40°C. There could be eight to ten trucks being tested at any one time with some vehicles reaching as high as 1,2 million kilometres under test conditions. The trucks are loaded for the necessary weight of approximately 56 - 58 tonnes. Truck down-time has decreased since testing in East London. Products pre-tested here considerably reduce excessive warranty claims and failure rates – it's an essential part of securing the future for Mercedes-Benz technology. □

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**This test centre has been incorporated into the international DaimlerChrysler development process.**  
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*The local DaimlerChrysler testing facility in East London includes a chassis dyno but on-the-road driving tests with simulated loads are conducted around the Eastern Cape on a daily basis. This test centre has been incorporated into the international DaimlerChrysler development process.*

### *From page 4 ... Night View Assist*

infrared headlamps illuminate the road ahead and extend the truck driver's range of vision to around 150 metres when dipped beam is switched on – even in the rain or fog and when oncoming vehicles have their headlamps switched on. *Night View Assist* allows a driver to see pedestrians, cyclists,

parked trucks and practically everything that is happening on the road at a much earlier stage. An infrared camera inside the windscreen records the reflected road image, projecting it onto a black-and-white dashboard display. □

# Conclusion

## Just imagine...

**N**ot only in South Africa, but the world over, there's a shortage of professionally qualified truck drivers. The USA is already forecasting that the growth of the road transport industry will be limited by the lack of drivers. The African scene is even more challenging due to the impact of the AIDS pandemic. We will require drivers of every sex and from an ever increasing pool of inexperienced youth. The only way to handle this future is to automate as much as possible, reduce the skill required and while minimising a truck driver's intervention with the vehicle, make truck driving more attractive to keep the wheels rolling.

Just imagine in a 24/7 transport operation, where three drivers handle one vehicle combination, that each driver faultlessly couples and uncouples trailers and that they all drive the route to exactly the same fuel consumption and trip-time standard. Just imagine that the same three drivers enjoy a minimum five year accident-free record with minimum driving fatigue. Just imagine they actually enjoy the freedom of the road because the truck takes up the slack of human error. Just imagine they now are recognised for piloting, not driving, the truck. Just imagine that every vehicle and driver give the full worth of every 60 seconds distance run every day.

DaimlerChrysler technologies are today's reality preparing for tomorrow's world. We are moving towards this future. Some of the technologies described here will be launched this year and in the years following. This is the way we will be able to take charge of the future both in Africa and internationally. □



*The ATP Automotive Testing Facility at Papenburg which FleetWatch correspondent Dave Scott visited to experience first-hand Mercedes-Benz working on technological innovations to make your trucking future safer and more profitable.*



*Mercedes-Benz trucks - equipped for the future.*

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