

Press Kit: The 2009 Mercedes-Benz S-Class

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The 2009 Mercedes-Benz S-Class: Pacemaker in automotive development

Press Information

19 October 2009

After four years in production and sales of 270,000 units, Mercedes-Benz is now presenting the 2009 S-Class. With an even more dynamic design, even more comfort and path-finding innovations, this extensively updated new series of the world's most successful luxury saloon is reiterating its claim to be the standard for automotive progress. The engine range includes six up-to-date petrol and diesel units, which generate the same, high output as in the preceding series but require up to seven percent less fuel. The high safety standard typical of the S-Class is further improved by a unique combination of new camera and radar based driver assistance systems, with innovations such as ATTENTION ASSIST drowsiness detection and Adaptive Highbeam Assist. More agility and driving enjoyment is ensured by Direct-Steer and modified Active Body Control with crosswind stabilisation for the eight- and twelve-cylinder models. The new luxury saloon will be in the showrooms of Mercedes-Benz's own-retail outlets and authorised Australian dealerships from October 2009.

With 270,000 units sold since its market launch in the European autumn of 2005, the W 221- series S-Class is the world's most successful luxury saloon. Since 1951, when the Model 220 founded the lineage of the S-Class, Mercedes-Benz has sold around 3.3 million units of this model series. Dr. Dieter Zetsche, Chairman of Daimler AG and CEO of Mercedes-Benz Cars: "The S-Class is the worldwide market leader. Thanks to innovative technology, first-class comfort and trailblazing safety systems, the flagship model from Mercedes-Benz is seen as a pioneer in automotive development."

Efficient diesel and petrol engines

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The 2009 S-Class is available in Australia with a choice of six engines: one V6 turbo-diesel unit and five petrol units with six, eight and twelve cylinders. By means of specific aerodynamic fine-tuning, tyres with a lower rolling resistance and modifications to the steering, fuel pump and 7G-TRONIC automatic transmission, Mercedes-Benz developers have been able to reduce both fuel consumption and CO2 emissions by up to seven percent.

With a combined diesel fuel consumption rate down to 7.7 litres per 100 kilometres and CO2 emissions of 202 grams per kilometre, the **S 350 CDI BlueEFFICIENCY** (173 kW) boasts outstanding figures for the luxury class. Mercedes-Benz achieves this exemplary efficiency with a tailor-made BlueEFFICIENCY package, which also includes closed underbody panelling and decoupling of the 7G-TRONIC automatic transmission when at standstill.

The range of petrol engines comprises the six-cylinder **S 350** (200 kW) with a displacement of 3.5 litres and the eight-cylinder unit in the **S 500** (285 kW; displacement 5.5 litres). The flagship model is still the **S 600** with the 380 kW twelve-cylinder biturbo unit), which accelerates the luxury saloon to 100 km/h in 4.6 seconds.

The Mercedes-AMG high-performance contributions to the range are the **S 63 AMG** with its 386 kW V8 engine (displacement 6.2 litres) and the **S 65 AMG** with a 450 kW twelve-cylinder engine (displacement 6.0 litres).

Unique combination of driver assistance systems

A combination of ultra-modern assistance and protection systems turns the S-Class into an "intelligent" partner that can see, feel, respond reflexively and act independently to prevent accidents or mitigate their effects. For the first time Mercedes-Benz also uses cameras in these systems - these are able to look well ahead, monitor the car's surroundings and interpret critical

situations. One example is the optional **Adaptive Highbeam Assist**. This system recognises oncoming vehicles or vehicles ahead with their lights on, and then controls the headlamps to ensure the best possible beam range without dazzling other road users.

As a new feature the **Night View Assist Plus** with infrared camera is now equipped with a special pedestrian detection function: as soon as the system detects pedestrians on the road ahead, they are highlighted on the display to make them more readily noticeable.

Lane Keeping Assist is another system that "looks ahead" for even safer driving. The camera on the inside of the windscreen is able to recognise clear lane markings by evaluating the contrasting images of the road surface and the markings. If the vehicle leaves its lane unintentionally, the driver is warned by short vibrations in the steering wheel. Unlike conventional systems of this kind, the Mercedes system is able to evaluate the driver's activities as well, and can reliably ascertain whether the car is leaving its lane intentionally or not. There is therefore no warning if the driver, for example, accelerates before overtaking or joining a motorway, brakes heavily or enters a bend.

Drowsiness detection on the basis of more than 70 parameters

Thanks to an innovative technology the 2009 S-Class has a very sensitive antenna for the attention level of its driver, and can warn them in time when they become drowsy. The **drowsiness detection system ATTENTION ASSIST** continuously monitors more than 70 different parameters. Once the evaluation electronics recognise the steering behaviour pattern that typically indicates the onset of drowsiness on the basis of information from the highly sensitive steering angle sensor, a warning signal is sounded and "ATTENTION ASSIST. Take a break!" appears in the instrument cluster. Attention Assist is standard equipment in the 2009 S-Class.

"Electronic crumple zone" for maximum occupant protection

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Mercedes-Benz has also improved the long- and medium-range radar used by **Brake Assist (BAS) PLUS** and **DISTRONIC PLUS proximity cruise control**.

Mercedes-Benz also offers another radar based system for the S-Class in the form of the PRE-SAFE® brake. If the driver is distracted and fails to recognise the immediate danger of a rear-end collision, or the warning signal of an assistance system, this system can intervene and brake the vehicle independently. The 2009 S-Class makes use of the latest development stage of this safety system: if the driver fails to react even after automatic, partial braking action, the PRE-SAFE® Brake activates the maximum braking pressure around 0.6 seconds before what is now recognised as an unavoidable accident - an emergency braking action that can significantly mitigate the severity of the impact. The PRE-SAFE® Brake therefore acts as something like an "electronic crumple zone".

New: Active Body Control reduces the effect of a crosswind

The S-Class also meets the highest expectations with respect to driving dynamics and agility. This is in part due to **Direct-Steer**, with a steering ratio that varies with the steering angle, and **modified Active Body Control (ABC)** with **crosswind stabilisation** (optional for the eight-cylinder model, standard for S 63 AMG, S 600 & S 65 AMG). For this purpose ABC uses the yaw rates and lateral acceleration sensors of the Electronic Stability Program ESP® to vary the wheel load distribution via the ABC spring struts within milliseconds, depending on the direction and intensity of the crosswind. This enables the effects of crosswinds to be largely compensated.

Extra safety at the physical limits, as well as even more agility, is provided by the **Torque Vectoring Brake** in the 2009 S-Class – targeted, one-sided braking intervention at the inside rear wheel when cornering. The result is a defined turning moment around the vehicle's vertical axis, which means that

the car turns into the bend precisely and without any loss of handling dynamics. This Torque Vectoring Brake function is standard equipment in the 2009 S-Class.

Powerful and self-assured presence

The modified design of the 2009 S-Class reflects the effortless superiority and power of the S-Class Saloon. It is characterised by the more pronounced arrow-shape of the radiator grille, plus a new front bumper with a discreet light-catching contour and a chrome strip below the cooling air intakes. The headlamps have bi-xenon technology as standard.

An even more dynamic look is ensured by the LED Light package with its striking **LED arrays** for daytime driving lights, indicators and driving lights. They lend an unmistakable day-and-night design to the front end. The rear end is characterised by tail lights in a new design, with horizontal, white light rather than the previous inserts in the vehicle colour. Here too, a total of 52 LEDs arranged in a curved design form an unmistakable light signature.

Mercedes-Benz also makes more use of light as a styling element in the interior. In future the **ambient lighting** will provide customers with a choice between three lighting moods: solar (amber), neutral (white) and polar (ice-blue).

State-of-the-art multimedia technology

In line with its serene character and claim to be a technological trendsetter, the 2009 S-Class also sets standards where onboard infotainment is concerned. As a world first Mercedes-Benz will equip its flagship model with the new **SPLITVIEW technology** for the COMAND APS control and display system centrally located in the centre console. This innovative display concept allows the driver and front passenger to view different content simultaneously on one and the same screen.

While the driver, for example, uses the map-based navigation system, the front passenger can be watching a latest-release film on DVD.

Mercedes-Benz has also extended the standard control and display system **COMAND** with additional functions; for example an SD memory card slot. Other new features include a **Bluetooth® interface**, which wirelessly connects a mobile phone to the standard onboard hands-free system, and a **USB interface**. These enable customers to export saved data and import them into any other S-Class. It is also possible to transfer navigation data to another vehicle. Mercedes-Benz also offers a **media interface** – a universal interface in the glove compartment for mobile audio devices like an iPod® and USB stick also with AUX input.

The **COMAND APS** is equipped with an Australia- and New Zealand-wide navigation system whose data is stored on a 40 GB hard disc. This allows particularly fast route calculation. The high level of navigating convenience is also aided by the **detailed three-dimensional map display (operational with WhereiS Version 16 mapping data due late 2009)**.

Musical entertainment is provided by a radio, a 6-disc CD/DVD player with MP3 function, an equalizer with speed-dependent volume control and the **MUSIC REGISTER** with a 7.2 GB hard disc which stores around 2500 digital music files in the MP3, AAC or WMA format.

The system recognises music files played on CD, DVD or from the MUSIC REGISTER using its stored Gracenote® database, and shows the title, album and performer in the colour display. The new **Music Search** function enables S-Class drivers and passengers to search SD memory cards, USB sticks, CDs and DVDs for specific music titles and performers. COMAND APS also includes the latest-generation **LINGUATRONIC** voice-operated control system, which operates the telephone and audio devices by whole-word commands. This has the advantage that the driver no longer has to spell out his commands. To select a radio station, choose a title from the

MUSIC REGISTER or access a contact in the phone directory, the driver only needs to say what they want.

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Mercedes-Benz has also increased the range of **rear seat entertainment** functions in the 2009 S-Class. As optional equipment, passengers in the rear have a remote control unit which enables all the audio and telematics functions of COMAND APS to be operated, plus access to external devices via the Media Interface. Mercedes-Benz also offers a **Rear Seat Entertainment package** with two eight-inch displays on the rear surfaces of the front seat head restraints, two wireless headphones and a separate CD/DVD player with connections for external audio and video devices.

The **surround sound system** with "Logic 7" technology developed by Mercedes-Benz together with the audio specialists Harman Kardon® delivers an outstanding performance with three-dimensional sound as a natural 360-degree musical experience for all passengers.

Interior: carefully selected materials and first-class finishing

The **multifunction steering wheel** of the S-Class has also been modified by the Mercedes-Benz designers: the rim and airbag module are now lined with soft nappa leather as standard. The new, flatter airbag module also lends a sporty touch to the multifunction steering wheel.

When choosing the interior, S-Class customers now have even more scope for their personal preferences. A total of **five different types of wood trim** provide perfectly coordinated material and colour concepts to suit personal tastes.

To make the decision-making process easier, Mercedes-Benz designers have developed **three new interior combinations** for the colour scheme: alpaca grey/basalt grey, cashmere beige/savanna beige and chestnut brown/black. Together with an all-black interior for the comfort-oriented business saloon and the well-proven combination of sahara beige/black, this

produces a total of five tasteful interior design options. In addition to standard leather upholstery two higher quality leathers, PASSION and Exclusive PASSION, are available as an option.

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At a glance: Australian Prices for the 2009 Mercedes-Benz S-Class

Model	Manufacturer's List Price (MLP)
S 350	\$214,900
S 350 CDI BlueEFFICIENCY (BE)	\$214,900
S 350 L	\$232,900
S 500	\$289,900
S 500 L	\$307,900
S 63 AMG	\$380,900
S 600 L	\$402,900
S 65 AMG L	\$482,900

The prices detailed in this document are current Manufacturer's List Prices (MLP) for the Mercedes-Benz S 350, S 350 CDI BlueEFFICIENCY, S 350 L, S 500, S 500 L, S 63 AMG, S 600 L, and S 65 AMG L.

As you may be aware, the MLP includes GST and any LCT applicable to the base / standard specification model but EXCLUDES DEALER DELIVERY AND ALL ON ROAD COSTS such as, for example, registration fees, stamp duty, CTP and the like.

Accordingly, please ensure that when you publish the details contained in this document, your publication makes it clear to its readers that:

- The attached pricing is an MLP
- That the MLP excludes on road costs and dealer delivery, and
- For drive away price information, consumers should contact dealers

Whilst we are unable to provide you with drive away pricing due to the wide variation in on-road costs between states and territories, and the different

ranges of dealer delivery imposed by dealers, we encourage you to contact one of our authorised Mercedes-Benz passenger car dealers in order to obtain relevant and accurate drive away information for your specific audience. Page 11

At a glance: some technical highlights of the Mercedes-Benz S-Class

<p>Cornering lights: this function of the bi-xenon headlamps and the Intelligent Light System provides more safety on junctions and when driving slowly on tight bends.</p>	Standard
<p>Active Body Control (ABC): active suspension system that adapts the springs to the current driving situation within fractions of a second.</p>	Optional S 500 (standard for S 63 AMG, S 600 & S 65 AMG)
<p>ADAPTIVE BRAKE: this Mercedes brake system offers assistance functions, such as a HOLD function and Hill Start Assist, for even greater safety and comfort.</p>	Standard
<p>Adaptive front airbags: the front airbags deploy in two stages, depending on accident severity.</p>	Standard
<p>Adaptive Highbeam Assist: this system dips the beams and adjusts the range of the headlamps in accordance with the distance to oncoming vehicles/vehicles travelling ahead.</p>	Standard
<p>Adaptive brake lights: flashing brake lights warn vehicles behind in an emergency braking situation.</p>	Standard
<p>AIRMATIC: the air suspension worked together with an electronically controlled damping system.</p>	Standard for all V6 and V8 engine variants
<p>Active multicontour seats: depending on the steering angle, lateral acceleration and speed, the inflation pressure and volume of the air chambers in the side bolsters of the seat backrests are varied to give the driver and front passenger even better lateral support. The seats also have comfort head restraints and a massage function.</p>	Optional as part of Front Seat Comfort package (standard for S 63 AMG, S 600 & S 65 AMG)

Active Light System: the Intelligent Light System's bi-xenon headlamps follow the driver's steering movements.	Standard
Ambient lighting: when driving at night, optical fibres behind the trim on the dashboard and door panels provide a pleasant lighting atmosphere in the interior.	Standard
ATTENTION ASSIST: this system warns the driver when it detects signs of drowsiness.	Standard
Motorway mode: from 90 km/h the entire width of the carriageway is illuminated, improving the driver's range of vision by around 50 metres; part of the Intelligent Light System	Standard
Bi-xenon headlamps: gas-discharge lamps for low and high beam improve safety at night.	Standard
Bluetooth interface: the mobile phone is wirelessly linked to the hands-free system.	Standard
Brake Assist PLUS: this system uses radar sensors to recognise an impending rear-end collision, calculates the necessary degree of braking assistance and makes it available immediately when the driver depresses the brake pedal.	Standard
COMAND APS: the navigation data are stored on a hard disc. Further functions include the MUSIC REGISTER and voice control.	Standard
Digital radio: a special DAB+ tuner (Digital Audio Broadcasting) and additional aerials is required to allow the reception of Australian digital radio broadcasts.	DAB+ tuner not expected until late 2010
DIRECT SELECT: seven-speed automatic transmission operated electronically using a lever on the steering column.	Standard
Direct-Steer: a variable steering rack ratio	Standard

depending on the steering angle allows more agile handling and provides more comfort when parking and manoeuvring at slow speed.	
DISTRONIC PLUS: this radar-based proximity control system automatically helps the driver to maintain a set distance from the vehicle ahead. It can brake the S-Class to a standstill if necessary, then accelerate again. If the distance to the vehicle ahead decreases too quickly, the system gives the driver visual and audible warnings.	Standard
Enhanced foglamps: This function of the Intelligent Light System pivots the offside headlamp outwards to illuminate the road verge more effectively.	Standard
ESP®: This safety system is able to reduce the risk of skidding in bends, and warns of pressure loss in the tyres.	Standard
Headlamp Assist: a sensor on the windscreen automatically switches the headlamps on when darkness falls.	Standard
Rear Seat Entertainment package: the rear faces of the front seat head restraints feature 8-inch displays connected to a DVD player.	Optional (standard S 65 AMG)
Gracernote®: database that recognises music tracks on a CD/DVD or from the MUSIC REGISTER and shows the title, album and artist on the colour display.	Standard
Belt force limiters: this technology reduces the force exerted by the belt strap on the seat occupant during a crash.	Standard for the front seats and the outer rear seats
Belt tensioners: any slack in the seat belt strap is instantly taken up during a crash to reduce the forward movement of the occupants caused by the impact.	Standard for all seats

Intelligent Light System: This innovative headlamp technology provides five lighting functions which are activated depending on the driving and weather conditions (also see Cornering lights, Country mode, Motorway mode, Active Light System and Enhanced foglamps).	Standard
KEYLESS-GO: the doors and boot can be opened without a key. It is sufficient to carry the KEYLESS-GO transponder on the person and operate the door handle. Merely operating the start/stop key is sufficient to start the engine.	Standard
Automatic climate control: this system controls four temperature zones and offers numerous adjustments for individual passenger comfort.	Standard
Kneebag: an additional airbag is able to reduce the loads acting on the driver during a frontal collision	Standard
Individual comfort seats: a seat unit with two comfortable, individual seats, a folding armrest, heating, comfort head restraints, a stowage box and cupholders is available for passengers in the rear.	Optional (standard for long-wheelbase variants)
Comfort telephony: the driver and passengers are able to conduct onboard telephone conferences by mobile phone, and send or receive SMS messages. The phone is housed in a cradle under the armrest.	Standard
Paintwork: Nano-technology makes the paintwork more scratch-resistant and ensures a glossier sheen.	Standard
Country mode: this function of the Intelligent Light System replaces the previous low-beam headlamps and provides broader and brighter illumination of the opposite road verge.	Standard
LINGUATRONIC: the voice control system operates the radio, CD/DVD-player, CD/DVD-changer,	Standard

navigation system and telephone.	
Media Interface: this universal interface allows portable audio devices to be connected to and controlled by the infotainment system of the S-Class.	Standard
Memory function: three memory settings are stored for both the driver's and the front passenger seat. The settings for the steering wheel and exterior mirrors are also stored.	Standard
Multifunction steering wheel: the radio, telephone, navigation system, display and other devices can be controlled from the steering wheel.	Standard
Multicontour seats: inflatable air chambers enable the seat contours and seat cushion length to be adjusted to the individual occupant.	Optional as part of the Rear Seat Comfort package (standard S 63 AMG, S 600 & S 65 AMG)
MUSIC REGISTER with a 7.2 GB hard disc which stores around 2500 digital music files in the MP3, AAC or WMA format. These can be loaded from PC memory cards.	Standard
Music Search: search function that searches SD memory cards, USB sticks, CDs and DVDs for specific music tracks and performers.	Standard
Night View Assist PLUS: the display in the dashboard shows a realistic grey-scale image from an infrared camera that monitors the road ahead of the S-Class. Any pedestrians detected are additionally highlighted in the display.	Optional S 350 / S 350 CDI Blue EFFICIENCY
NECK-PRO head restraints: crash-responsive head restraints are able to support the heads of the driver and front passenger at an early stage during a	Standard

rear-end collision, reducing the risk of a whiplash injury.	
PARKTRONIC including Parking Guidance: ultrasonic sensors measure the length of parking spaces as the car drives past; instructions for safe parking appear in the display.	Standard
PRE-SAFE®: if the system recognises a critical driving situation, it takes precautionary measures to protect the occupants. It can e.g. initiate tensioning of the front seat belts, or closing of the wide windows and sliding sunroof.	Standard
PRE-SAFE® Brake: if there is imminent danger of a rear-end collision, this system brakes the S-Class automatically if the driver fails to react.	Standard
Reversing camera: the area behind the S-Class is shown in the COMAND display, and coloured directional lines show a precisely calculated path into a parking space.	Standard
Crosswind stabilisation: effects of crosswind are largely compensated.	Standard as part of Active Body Control for the S63 AMG, S 600 & S 65 AMG (optional S 500)
Sidebags: these side-mounted airbags reduce the loads acting on the occupants during a side impact.	Standard for the front and outer rear seats
7G-TRONIC seven-speed automatic transmission: this automatic transmission is installed in all the V6 and V8 variants.	Standard for all V6 and V8 engine variants
SPLITVIEW: the driver and front passenger are able to view different content on one and the same screen at the same time.	Standard
Lane Keeping Assist: a camera behind the	Standard

windscreen recognises clear carriageway markings and gives a warning if the car unintentionally leaves its lane.	
harman kardon® Logic 7® surround sound system: a multi-channel system with innovative digital technology, an output of 610 watts and 14 loudspeakers provides surround-sound for every seat.	Standard
Torque Vectoring Brake: by specifically braking the rear wheels, ESP® ensures more safety at the physical limits without any loss of agility.	Standard
Blind Spot Assist: this radar-based system warns the driver before a lane-change if it detects another vehicle in the exterior mirror's blind spot.	Standard
Windowbags: like a curtain, these large airbags extend from the A to the C-pillar in a side impact.	Standard

Model range: Wide range of high-tech systems in series production

- **Intelligently conceived equipment packages**
- **S 600: distinctive appearance, luxurious appointments**
- **AMG bodystyling and designo equipment packages for added individuality**

With trailblazing innovations for even more safety, comfort and functionality, the 2009 S-Class once again sets the pace and provides decisive impulses in automobile technology. The high technological level of the luxury saloon is combined with an intriguing design that exudes the serenity, self-assurance and elegance of the vehicle even at first glance.

The 2009 Mercedes-Benz S-Class provides a choice of two body variants and six engine variants. Engine output ranges from 173 kW to 380 kW. The V6 and V8 models are optionally available with a 130-millimetre longer wheelbase; the luxurious S 600 and S 65 AMG flagship models are available only with the long wheelbase.

Innovative systems in series production

A number of new or further developed high-tech systems that enhance safety and comfort are included in the standard appointments of the new S-Class. Among them are ATTENTION ASSIST, which warns the driver when it detects signs of drowsiness, Active Body Control with crosswind stabilisation for the S 500 and S 600, the Direct-Steer system, a driver kneebag and the further refined preventive occupant protection system PRE-SAFE®.

Selection of standard appointments:

- Adaptive driver and passenger airbags
- Adaptive brake lights
- AIRMATIC with Adaptive Damping System

- Anti-lock braking system (ABS)
- ATTENTION ASSIST
- 7G-TRONIC automatic transmission
- Bluetooth® interface
- ADAPTIVE BRAKE
- COMAND APS system with CD/DVD player , SD card slot and USB interface
- Diesel particulate filter (for variants 350 CDI BlueEFFICIENCY)
- DIRECT SELECT gearshift
- Direct-Steer
- Displays in the instrument cluster and for COMAND APS in black with LED backlighting
- ESP® with acceleration skid control (ASR)
- Headlamp assist
- Electric parking brake
- Belt tensioners on all seats
- Automatic climate control with separate settings for front footwell area
- Kneebag for driver
- Leather upholstery
- LED Light package
- Navigation package
- Light-alloy wheels: 18-inch (S 350 and S 350 CDI BlueEFFICIENCY) and 19-inch (S 500 and S 600)
- Memory function for the seats
- Metallic paintwork
- Nappa leather multifunction steering wheel
- NECK-PRO crash-responsive head restraints
- PRE-SAFE®
- Tilting/sliding glass sunroof, electric, with PRE-SAFE® function
- Two-stage rain sensor
- Front Seat Entertainment package
- KEYLESS-GO package
- Comfort telephony

- Tyre pressure loss warning system
- Front and outer rear seatbelts with automatic comfort-fit feature
- Sidebags front and rear
- Daytime driving lights and foglamps integrated into the bumper
- Telephone keypad
- Doorhold
- Front seats with electric fore/aft and height adjustment with lumbar support and PRE-SAFE® positioning function
- Tinted, sound-insulating, infrared-reflecting laminated glass all round
- Windowbags

Additional standard equipment for the long-wheelbase version of the new S-Class includes:

- Electric rear windscreen roller blind
- Electric rear side window blinds
- Rear seat bench with electrically adjustable outer seats and PRE-SAFE® positioning function for the seat bench and outer head restraints

Equipment packages: substantial benefits thanks to perfect combinations

No automobile in the luxury class offers such an extensive and intelligently coordinated combination of modern assistance systems and comfort-enhancing features as the S-Class.

To ensure that customers derive the greatest possible benefit from these technologies, Mercedes-Benz offers specific innovations as standard packages. This ensures that the systems work together perfectly and complement each other. In addition to their major benefits, these packages also have a clear price value advantage for the customer.

- In the **Driving Assistance package** Mercedes-Benz mainly combines systems that can actively help to prevent rear-end collisions: the radar-based proximity cruise control system

DISTRONIC PLUS, Brake Assist PLUS and the automatic braking system PRE-SAFE® Brake. This equipment package also includes Lane Keeping Assist and Blind Spot Assist.

- Mercedes-Benz has put together the **LED Light package** for drivers who are frequently on the road at night, or who wish to give their S-Class even further visual enhancement. This not only includes the Intelligent Light System, LED daytime driving lights as well as indicators and side lights employing LED technology, but also the innovative Adaptive Highbeam Assist.
- Mercedes-Benz offers the **Navigation package** for drivers who cover high mileages. This includes the multimedia system COMAND APS with 40 GB HDD navigation, 3D map display, LINGUATRONIC voice control, the MUSIC REGISTER, and, Music Search
- An exclusive audio experience and video entertainment for the front passenger is provided by the **Front Seat Entertainment package**. This includes the SPLITVIEW display, the 6-disc DVD changer and the Harman Kardon® Logic 7® surround sound system.
- In the **Rear Seat Entertainment package** Mercedes-Benz combines a DVD player with remote control unit and two colour displays in the front head restraints with the surround-sound system (standard S 65 AMG).
- For comfort-oriented customers the S-Class is available with the **Front Seat Comfort package**, which comprises improved active multicontour seats with massage function and dynamic function with comfort head restraints featuring adjustable side bolsters and NECK-PRO technology (standard for S 63 AMG, S 600 & S 65 AMG).
- The **Rear Seat Comfort package** equips the S-Class with multicontour rear seats with a massage function and comfort head restraints (standard for S 63 AMG, S 600 & S 65 AMG).
- The **Parking package** comprises PARKTRONIC including Parking Guidance and a reversing camera.
- The **Memory package** has electrically adjustable seats with 4-way lumbar support for the driver and front passenger, including a memory function for the seats, exterior mirrors and steering column.

- The **Rear Seat Memory package** for the short-wheelbase S-Class includes the rear seat unit of the long-wheelbase version with electrically adjustable outer seats and a folding centre armrest with wood trim, as well as the seat memory function.
- The **KEYLESS-GO package** offers additional convenience with the keyless access and starting system KEYLESS-GO and automatic boot lid closing.

The S 600: luxury and performance with a distinctive appearance

Mercedes-Benz stylishly underlines the exceptional status of the twelve-cylinder S 600 with numerous distinguishing features in the exterior and interior. In addition to the model-specific radiator grille with three twin louvres, these include the V12 emblem on the flanks, multi-spoke 19-inch alloy wheels and a large range of option packages. Standard ex-factory specifications include:

- Front Seat Comfort package
- Rear Seat Comfort package

The active multicontour front seats and multicontour rear seats are upholstered in particularly soft "Exclusive PASSION" nappa leather. In addition to the familiar transverse contouring in the S-Class, the seats also feature longitudinal piping. This pattern is repeated in the Alcantara roof lining and interior door panels.

Travelling pleasure is further enhanced by comfort head restraints in the front and rear. The V12 symbol in the backrests underlines the exclusive character of this model. When entering the car, the logo also lights up in the instrument cluster. Dark burr walnut wood trim or optional (at no additional cost) brown poplar wood trim with a high-gloss finish rounds off the matchless appearance of the Mercedes-Benz S 600. Ambient lighting is fitted as standard equipment.

Technical highlights include the Active Body Control suspension with crosswind stabilisation.

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***designo* and *designo* Selection: individual and exclusive**

For further individualisation, S-Class customers are also able to choose from a restructured range of ***designo*** features. Ten different *designo* paint finishes can be combined with twelve *designo* aniline leather interiors and four natural leather interiors – with practically no limitations on personal taste.

For *designo* wood trim, customers have a choice between natural-grain maple and natural-grain matt oak. The unique natural stone *designo* trim of genuine granite is available for the S-Class in two versions - Labrador Blue Pearl and black Star Galaxy. Trim in black piano lacquer and champagne white piano lacquer can also be ordered.

AMG Sports package: the S-Class in a muscular and dynamic outfit

The S-Class becomes even more dynamic with the **AMG Sports package** with AMG bodystyling and AMG light-alloy wheels. At the front the newly-designed front apron ensures a decidedly muscular appearance to make the 2009 S-Class look even more imposing. Its distinguishing feature is a tapered air intake with a wider lower edge. The side skirts continue the design of the front bumper, with striking contours that find an echo in the rear apron. The prominent rear bumper with a black insert is the perfect finishing touch.

A particularly sporty touch is also provided by the 19-inch AMG light-alloy wheels in a five-spoke design, which are painted in sterling silver. Shod with wide-base tyres in size 255/40 (front) and 275/40 (rear), they not only fill the wheel arches to perfection to give the S-Class a decidedly dynamic appearance, but also contribute to the outstanding handling characteristics. A sporty look is also ensured by the silver-painted front brake callipers with

Mercedes-Benz lettering. When equipped with the AMG Sports package, the 6-cylinder models also receive the 350-millimetre (standard: 335 mm) perforated front brake discs of the 8-cylinder variants.

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The interior is characterised by a wood/leather steering wheel, black ash wood trim and sports pedals of brushed stainless steel with black rubber studs. Like the striking AMG light-alloy wheels, AMG bodystyling is included with AMG Sports Package for all engine variants of the Mercedes-Benz S-Class.



Market success: Number One in the luxury segment

- **270,000 units sold since the market launch in 2005**
- **The eight-cylinder S 500 is the best selling model**

The Mercedes-Benz S-Class remains unbeatable in the luxury class: with 270,000 units of the current W 221 series sold since its market launch in autumn 2005, it is the world's most successful luxury saloon.

And as the trendsetter where innovative automobile engineering is concerned, it is seamlessly continuing the success story of its predecessors. Dr. Dieter Zetsche, Chairman of Daimler AG and CEO of Mercedes-Benz Cars: "The S-Class is the worldwide market leader. Thanks to innovative technology, first-class comfort and trailblazing safety systems, the Mercedes-Benz flagship model is seen as a pioneer in automobile development."

A dozen technical innovations entered series production for the first time in the W 221 series - from Brake Assist PLUS with radar sensors to the dynamic multicontour seat with an extended massage function, from Night View Assist with infrared technology to the improved COMAND system, from preventive PRE-SAFE® occupant protection with additional functions to the Active Body Control suspension. The 2009 S-Class likewise leads the field in automotive development with a unique combination of radar and camera-based assistance systems, plus the first series-production hybrid drive system with a lithium-ion battery in the S 400 HYBRID.

Largest markets: United States, China and Germany

Accounting for one quarter of total unit sales, the United States of America are the largest market for the S-Class, followed by China. A major contribution to the success of the S-Class in China was made by the

introduction in June 2008 of the S 350 4MATIC specifically configured to meet the wishes of Chinese customers.

After the USA and China, the German home market is the third-largest market for the S-Class.

The most popular variant is the eight-cylinder S 500, which accounts for almost half of all worldwide sales, followed by the six-cylinder S 350 and the diesel-powered S 320 CDI, which also has six cylinders. In the 2009 S-Class this carries the model designation S 350 CDI BLUE EFFICIENCY.

The success story of the S-Class is also studded with numerous prizes and awards in international competitions. Here is a selection:

Date	Award	Organiser
January 2008	Best Car Awards	auto, motor und sport (Germany)
November 2007	Auto Trophy	Auto Zeitung (Germany)
March 2006	Fleet Car of the year	Firmenwagen (Austria)
January 2006	Best Car in the luxury class	What Car? (Great Britain)
December 2005	Luxury Top Car	Motor-Informations-Dienst (Germany)
November 2005	Golden Steering Wheel	Bild am Sonntag (Germany)

The technical highlights of the S-Class and its predecessors

Since 1951, when the model 220 began the direct lineage of the S-Class, Mercedes-Benz has delivered around 3.3 million passenger cars from this model series to customers. This means that in terms of tradition too, this prestigious saloon easily leads the field. The S-Class has always been a trailblazer for the latest automobile technology, and as such the advance guard for the entire Mercedes-Benz brand.

A brief overview of the special technical features in the individual model series:

Model 220, W 187 series (1951 to 1954)

- Newly designed six-cylinder engine with overhead camshaft
- Patented safety conical-pin locks prevent doors from jumping open in an accident
- Fan heater available
- Duplex drum brakes at the front

Models 220 a, 220 S and 220 SE, W 180/128 series (1954 to 1959)

- Unitary body design
- Front suspension subframe
- Single-link swing axle with low centre of gravity
- Brake drums with "turbocooling"
- "Hydrak" automatic hydraulic clutch (available from 1957)

Models 220 b, 220 Sb, 220 SEb, 300 SE, W 111/112 series (1959 to 1965)

- Rigid safety passenger compartment with energy-absorbing crumple zones at the front and rear
- Steering wheel with padded boss and elimination of sharp edges in the interior
- Conical-pin door lock with two safety catches
- Disc brakes (300 SE, 220 S/SE from 1962)
- Three-point seat belts
- Four-speed automatic transmission (available from 1961)
- Air suspension (300 SE)
- Long-wheelbase version available (300 SE)

Models 250 S – 300 SE, 300 SEL – 300 SEL 6.3, W 108/109 series (1965 to 1972)

- Safety steering system comprising telescopic steering column and steering wheel with impact absorber (from 1967)
- Hydropneumatic compensator spring at the rear axle

- Also available with eight-cylinder engine (from 1967)

S-Class 280 S to 450 SE, 280 SEL to 450 SEL 6.9, W 116 series (1972 to 1980)

- Officially known as the "S-Class" for the first time
- Fuel tank installed above the rear axle for collision protection
- Safety interior (with four-spoke safety steering wheel)
- Safety door handles
- Side windows with anti-soiling measures
- Tail lights with anti-soiling design
- Anti-lock braking system ABS (available from 1978)
- Double-wishbone front suspension from the C 111 experimental vehicle
- First luxury class saloon with a diesel engine (300 SD)

S-Class 260 SE to 560 SE, 300 SEL to 560 SEL, W 126 series (1979 to 1991)

- New safety concept, the world's first series production car to be configured for an asymmetrical, frontal crash (offset crash)
- First use worldwide of a driver airbag and belt tensioner in a series production car (available from 1981)
- Front passenger airbag (available from 1987)
- Three-point seat belts in the rear
- Automatic locking differential
- Acceleration skid control ASR (available from 1985)

S-Class 300 SE 2.8 to S 600; 300 SEL to S 600 long-wheelbase, W 140 series (1991 to 1998)

- Electronic Stability Program ESP® (available from 1995)
- Brake Assist BAS (from 1996)
- Adaptive Damping System ADS (available from 1991)
- Seat belt system with automatic height adjustment
- Sidebags (from 1995)

- First series production Mercedes-Benz car with a twelve-cylinder engine

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S-Class S 280 to S 500; S 280 long-wheelbase to S 600, W 220 series (1998 to 2005)

- Belt tensioners and belt-force limiters in the rear
- Automatic child seat detection
- WINDOWBAG
- Occupant protection system PRE-SAFE® (from 2002)
- DISTRONIC proximity control (available from 1998)
- Automatic cylinder cut-out (S 500/S 600)
- KEYLESS-GO (available from 1998)
- AIRMATIC air suspension with adaptive damping system
- COMAND control and display system
- Active Body Control suspension
- Active seat ventilation (available from 1998)
- Bi-xenon headlamps with dynamic beam range control and headlamp cleaning system (available from 2002)

S-Class S 320 CDI to S 500; S 320 CDI long-wheelbase to S 600, W 221 series (2005-2009)

- Brake Assist PLUS with radar sensors
- DISTRONIC PLUS proximity control with extended speed range
- Parking Assist based on radar
- Dynamic multicontour seat with extended massage function
- Night View Assist with infrared technology
- Further development of PRE-SAFE® occupant protection
- World's first automobile with an Environmental Certificate
- COMAND system with menu navigation and Controller
- "S/C/M" keys for individual adjustment of the damper and transmission characteristics and the level control system
- Blind Spot Assist (since 2006)

S-Class S 350 to S 500; S 350 L to S 600; W 221 series (2009)

- World's first hybrid drive system with a lithium-ion battery in the S 400 HYBRID
- ATTENTION ASSIST drowsiness detection system
- Adaptive Highbeam Assist
- Night View Assist Plus
- Speed Limit Assist
- Lane Keeping Assist
- Further development stage of PRE-SAFE®
- An "electronic crumple zone" - the PRE-SAFE® Brake
- DISTRONIC PLUS and Brake Assist PLUS with further developed radar technology
- Torque Vectoring Brake
- Active Body Control with crosswind stabilisation
- Direct-Steer

Drive system: Serene and efficient

- **Up to seven percent lower fuel consumption and CO2 emissions**
- **Energy management: on-demand control of the ancillary components**
- **S 350 CDI BlueEFFICIENCY with combined fuel consumption of 7.7 litres of diesel per 100 kilometres**

Apart from the trailblazing hybrid of the S 400 HYBRID, the range of engines for the 2009 S-Class comprises six other units: one diesel and five petrol engines with six, eight and twelve cylinders. Their fuel consumption and CO2 emissions have been reduced by up to seven percent for the same, high output. Mercedes-Benz developers have achieved these advances with aerodynamic fine-tuning, tyres with a lower rolling resistance and a higher air pressure, and modifications to the fuel pump and 7G-TRONIC automatic transmission.

Tyres with a lower rolling resistance

The 2009 S-Class makes use of tyres for which the rolling resistance has been reduced by up to ten percent, thanks to the use of specially specified rubber blends for the tyre tread and sidewall, while retaining good handling and braking characteristics. Rolling resistance is primarily caused by deformation of the tyre on contact with the road surface, known as the working deflection. This causes the vehicle to slow down and also requires it to use more energy in order to overcome this deformation resistance. As a general rule: the greater the rolling resistance, the higher the fuel consumption. As much as 20 percent of the fuel consumption can depend on the tyres.

Lower engine speeds, demand-controlled fuel pump

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In addition, the standard 7G-TRONIC transmission has a **fuel economy shift program** in the comfort ("C") driving mode of the V6 and all V8 petrol models.

This is always active when the engine is started. Thanks to earlier upshifts, the engine operates at a lower speed and therefore consumes less fuel.

In order to ensure on-demand energy management, Mercedes-Benz uses **demand-controlled fuel pumps** in the petrol engines of the S-Class. In this setup, the engine control unit only calls for the maximum pump output during full-load operation. In all other driving situations, the pump adapts the delivery volume and pressure in line with the current driving situation, resulting in a fuel saving of 0.15 litres per 100 kilometres (NEDC).

An additional new development: the V6 models as well as the V8 petrol-engine versions with AIRMATIC air suspension feature an electric power steering pump. The main advantage of this system is that when driving in a straight line, only a small quantity of oil is delivered to the steering gear when needed and as a result the power steering pump requires less energy.

S 350 CDI BlueEFFICIENCY: as economical as a medium-class model

Mercedes-Benz developers have come up with a tailor-made package to realise even greater savings potential in the S 350 CDI BlueEFFICIENCY. In addition to the above measures, these include aerodynamically efficient, enclosed underbody panelling and **standstill decoupling** of the 7G-TRONIC automatic transmission when the car is at rest. The torque converter interrupts the power flow as soon as the car comes to a stop with the engine running. This eliminates the hydrodynamic resistance of the torque converter, the engine is subjected to less load and the fuel consumption falls. This decoupling function also reduces noise and vibrations when at rest, and improves idling smoothness even further. The

slip-controlled clutch is engaged as soon as the driver releases the brake pedal.

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With a combined NEDC (ADR 81/02) fuel consumption of 7.7 litres of diesel per 100 kilometres, which corresponds to CO₂ emissions of 202 grams per kilometre, the 173 kW/235 hp S 350 CDI BlueEFFICIENCY has the fuel consumption and emissions of a medium-class car. At the same time this V6 CDI engine impresses with superior output and torque figures of 173 kW/235 hp and 540 Nm at 1600 rpm. Accordingly this model accelerates to 100 km/h in 7.8 seconds, with a maximum speed of 210 km/h.

Key technical features of the engine include an aluminium crankcase, common-rail injection and piezo-electric injectors in place of solenoid valves. Their crystalline structure changes within milliseconds when subjected to an electric voltage. As a result the needle at the tip of the injector is raised with a precision of only a few thousandths of a millimetre, producing a particularly fine injection of fuel. Up to five fuel injections with a peak pressure of up to 1600 bar are possible for each power stroke.

An electrically controlled intake port shut-off modifies the swirl characteristics of the air flowing into the cylinders, which also optimises the combustion process with the aim of reducing the fuel consumption and exhaust emissions even further. The VNT turbocharger (Variable Nozzle Turbine) with electrically adjustable turbine blades, the exhaust gas recirculation with a control valve and the intake air throttling are also regulated as the situation requires on the basis of measured data.

S 350: performance, smoothness and economy

Compared to the preceding model, the V6 petrol engine in the 2009 S-Class consumes around one percent less fuel. The combined NEDC (ADR 81/02) consumption is 9.8 litres of premium petrol per 100 kilometres, while CO₂ emissions have been reduced to 234 grams per kilometre.

The six-cylinder powerplant develops 200 kW at 6000 rpm from a displacement of 3498 cc, as well as 350 Newton metres of torque which is available from as low as 2400 rpm and remains constant up to 5000 rpm. That guarantees exceptional pulling power and rapid mid-range acceleration, but also relaxed driving in high gears. The S 350 sprints from standstill to 100 km/h in 7.3 seconds, and reaches a top speed of 210 km/h.

With four-valve technology and four overhead camshafts, Mercedes engineers created major conditions for an exemplary performance curve, but this was not all. In addition they developed a system by which the interaction of the 24 valves can be controlled as required – depending on the engine load – while ensuring an extremely rapid gas cycle in the cylinders: continuously variable adjustment of all four camshafts. This means that the angles of both the intake and exhaust camshafts can be continuously varied by 40 degrees, ensuring that the valves open or close at the best possible moment in any driving situation.

Tumble flaps in the intake ducts, a **two-stage intake manifold** and **intelligent thermal management** to keep the engine oil and coolant at the best possible temperature round off this high-tech package. The cylinder head and crankcase of the V6 engine are of aluminium. A balancer shaft between the two banks of cylinders ensures exemplary smoothness. This counter-rotates with the crankshaft and at the same speed.

S 500: eight cylinder model with effortless power delivery

In the S 500 V8 petrol model, Mercedes-Benz developers have reduced the combined NEDC (ADR 81/02) fuel consumption by five percent to 10.9 litres per 100 kilometres. CO₂ emissions have fallen to 260 grams per km.

The ultra-modern 5.5-litre eight-cylinder engine develops 285 kW/388 hp, with a torque of 530 Newton metres. Maximum torque is available from 2800 rpm, remaining constant over a wide engine speed range up to 4800 rpm. An ideal basis for powerful acceleration and fast mid-range sprints:

- The S 500 accelerates from **zero to 100 km/h** in 5.4 seconds.
- In manually selected third gear, the V8 Saloon sprints from **60 to 120 km/h** in just 5.6 seconds.

The maximum speed of the S 500 is likewise an electronically limited 210 km/h.

The V8 engine is produced together with the six-cylinder unit of the S 350 in Stuttgart Bad Cannstatt. This means that both engines come from the same family, and share the same characteristics: **light-weight alloys** for the blocks and cylinder heads, four overhead camshafts, four-valve technology and variable camshaft adjustment on the intake and exhaust sides for **an optimal supply of fresh mixture to the cylinders**.

The "quadruple", continuously variable camshaft adjustment process is further enhanced by shifting camshafts, which are used to enable opening of the exhaust valves and, therefore further improve the engine's gas cycle. The exhaust cams are designed so that the valves open at different times during the exhaust process. As a consequence, the pressure fluctuations inherent to a V8 engine's exhaust train are reduced. Thanks to a more constant residual gas content, a higher knock limit and improved bottom-end and mid-range cylinder charging, the shifting camshafts increase the engine's torque and refinement.

Moreover, the V8 engine has the same technical innovations for the demand-related control of the combustion processes with which the six-cylinder engine excels: a **two-stage intake module** for a controlled air intake depending on the engine load and engine speed, **flow-optimised air ducting** for the best possible air supply to the engine and **tumble flaps** at the end of each intake duct for more complete combustion. As a further feature shared with the V6 units, a characteristic map controlled thermostat ensures that the engine oil and coolant are always at the optimal temperatures.

Other characteristics of the V8 engine in the S 500 include low-friction cylinder liners made from an aluminium/silicon alloy and the forged steel crankshaft with five bearings, whose main and connecting rod bearings are induction hardened. The connecting rods are likewise of forged steel, are weight-optimised by precision milling.

S 600: twelve-cylinder engine with twin turbochargers

The flagship model remains the S 600 with a 380 kW twelve-cylinder biturbo engine, which accelerates the luxury saloon from zero to 100 km/h in just 4.6 seconds. Maximum torque is 830 Newton metres at 1800 rpm, which makes the 5.5-litre engine one of the world's most powerful series-production car engines.

The V12 combines its impressive performance potential with exemplary smoothness and outstanding noise comfort – the best possible preconditions for refined and highly enjoyable travel.

The crankcase of the V12 engine is made from diecast aluminium, while diecast magnesium is used for the cylinder-head covers. Fracture-split or "cracked" conrods made from high-strength forged-steel alloy, pistons made from a high-quality aluminium alloy, hollow camshafts of induction-hardened forged steel, a weight-optimised forged-steel crankshaft and a diecast aluminium sump feature among the other lightweight components of the engine.

On both sides, the turbines of the two turbochargers are integrated into the exhaust manifolds to save space, and are therefore in the best position for high efficiency. The compressed air flows through two close-coupled water intercoolers on the cylinder head covers. Depending on the engine load the air is cooled by up to 100 degrees Celsius, achieving just the right temperature and density for the combustion process.

The Mercedes-AMG high-performance contributions to the range are the **S 63 AMG** with its 386 kW V8 engine (displacement 6.2 litres) and the **S 65 AMG** with a 450 kW twelve-cylinder engine (displacement 6 litres). Page 38

Transmission: seven ratios and three driving modes

The six- and eight-cylinder engines are combined with the 7G-TRONIC seven-speed automatic transmission as standard, while Mercedes-Benz combines the V12 engine of the S 600 with a five-speed automatic transmission. The DIRECT-SELECT lever on the steering column enables the driver to select "P", "N", "R" and "D" by nudging the selector. The operating commands are transferred purely electronically, by wire.

The S/C/M transmission mode selector switch on the centre console allows the driver to choose between three different modes: Sport, Comfort and Manual. As well as the transmission characteristics, these modes also change the characteristics of the accelerator pedal. In Manual mode, the driver changes gear using the steering-wheel gearshift buttons.

Active and passive safety: "Intelligent partners"

- **Adaptive Highbeam Assist selects the optimum light settings automatically**
- **ATTENTION ASSIST is able to recognise signs of drowsiness**
- **An "electronic crumple zone" - the PRE-SAFE® Brake**

Following a successful commitment to occupant protection, the future focus of the developers at Mercedes-Benz will be more and more on the prevention of traffic accidents and the mitigation of their severity. The approach of the safety specialists in Sindelfingen follows the principle of "Real Life Safety". The majority of all the safety measures are based on findings from accident research, and are a response to what actually happens during accidents. Examples include well-proven Mercedes inventions such as ABS, ESP®, Brake Assist and PRE-SAFE®.

The development aim in these cases was to prevent particularly frequent and serious accidents, or at least - if an accident does occur - to mitigate the effects.

In the 2009 S-Class, Mercedes-Benz has continued this successful strategy with a pioneering synergy of the very latest assistance systems which turn the luxury saloon into an "intelligent" partner that can "see", "feel" and act independently. In line with this concept the new Mercedes-Benz model not only protects its occupants, but can also contribute decisively to the safety of other road users.

In addition to radar sensors, Mercedes-Benz also uses cameras for the first time in the S-Class - these are able to look well ahead and monitor the car's surroundings. The system's processors are in turn able to interpret critical situations on the basis of this information. The new camera-based assistance systems e.g. help the driver to stay in his lane, recognise speed

limit signs, control the headlamps as the situation requires and provide enhanced visibility in the dark.

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The right light in any driving situation with the Intelligent Light System

The Intelligent Light System offers five different bi-xenon light functions, each of which is suited to typical driving or weather conditions:

- Country mode
- Motorway mode
- Enhanced foglamps
- Active light function
- Cornering light function

The light system is based on **powerful bi-xenon headlamps**. These are variably controllable, and are networked with other electronic control units from which the headlamps obtain information about the current driving situation and distribute their beam patterns accordingly. The familiar low-beam headlamps are replaced by the new **country mode**, which illuminates the road verge on the driver's side more widely and brightly than before. In the dark, this enables the driver to appraise the situation and respond more rapidly when other road users cross the vehicle's path.

Motorway mode is activated automatically from a speed of 90 km/h, increasing the visibility range by up to 60 percent. This lighting function is activated in two stages: the Intelligent Light System first increases the output of the bi-xenon headlamps from 35 to 38 Watts, thereby increasing the light intensity with noticeably better illumination of the carriageway and its verges.

The second stage is activated from 110 km/h, when the bi-xenon module on the driver's side is raised slightly. The beam range in motorway mode is around 120 metres; at the centre of the cone of light the driver is able to **see around 50 metres further** than with the previous dipped beams.

Motorway mode increases visibility by 60 percent

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With the **enhanced foglamps**, Mercedes-Benz improves driver orientation when visibility is poor. The new lighting function is activated at speeds below 70 km/h, as soon as the rear foglamp is switched on. The variable headlamp technology incorporated in the Intelligent Light System makes it possible to pivot the bi-xenon headlamp on the driver's side outwards by eight degrees, while lowering the beam of light at the same time. This adjustment illuminates the inner half of the road more brightly and reduces the degree of glare from light reflected back by the fog.

The Intelligent Light System also includes the **active light and cornering light functions**. These are switched on automatically: depending on the steering angle, yaw rate and vehicle speed, the active headlamps pivot **sideways by up to 15 degrees** in fractions of a second, thereby greatly improving road illumination. On an extended bend with a radius of 190 metres, the driver is able to **see 25 metres further** than with conventional low-beam headlamps thanks to this system. This function operates in both low-beam and high-beam mode.

The **cornering light function** improves safety at crossroads, at T-junctions and on tight bends. It is activated automatically when the driver operates the turn indicators or turns the steering wheel at a speed below 40 km/h. The foglamps then swivel to illuminate the area diagonally in front of the vehicle for a distance of around 30 metres, with an angle of coverage of 65 degrees.

Mercedes-Benz combines the Intelligent Light System and Adaptive Highbeam Assist with daytime driving lights as well as indicators and side lights employing LED technology to form the **LED Light package**.

Adaptive Highbeam Assist for the best possible road illumination

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As part of the LED Light package, Mercedes-Benz combines the Intelligent Light System with Adaptive Highbeam Assist. This recognises oncoming vehicles or vehicles ahead with their lights on, and dips the headlamps. It also adjusts the beam range of the headlamps to give the driver the best possible visibility – without dazzling oncoming road users. The driver is able to see the course of the road, pedestrians and potential hazards more easily, and respond at an earlier stage.

Once the system registers oncoming vehicles or vehicles ahead with their lights on, it continuously adjusts the beam range to the distance so that the cone of light ends before it meets these vehicles. Adaptive Highbeam Assist also takes the steering angle into account, dipping the headlamps on tight bends. On clear stretches of road the system smoothly switches over to main beam. Practical trials have shown that drivers travel in greater safety in the dark with Adaptive Highbeam Assist: despite oncoming traffic, dummy pedestrians positioned at the roadside were also detected at a range of around 260 metres -- about 150 metres sooner than with conventional dipped headlamps. This new Mercedes assistance system therefore **more than doubles the safety margin** when driving at night.

Adaptive Highbeam Assist gives the best possible visibility without dazzling other drivers.

The system also relieves driver workload: he is no longer required to operate the multifunction stalk on the steering column, and can devote more attention to the road ahead. Once activated, Adaptive Highbeam Assist always ensures the best possible headlamp beam range. Research has shown that at night, the main beams are only switched on during around eight percent of all journeys.

Data transfer every 40 milliseconds

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The newly developed Mercedes technology is based on a **camera located on the inside of the windscreen**, which monitors the traffic situation in front of the car.

Thanks to an **intelligent image-processing algorithm**, the camera is able to detect other vehicles and the distance to them. The range of the variable-control bi-xenon headlamps is set based on these findings and adapted continuously depending on the distance to the vehicle in front or the oncoming traffic. The system operates at lightning speed, sending new data to the headlamps every 40 milliseconds.

Adaptive Highbeam Assist is ready to respond at speeds above 55 km/h, and operates autonomously once the driver has moved the rotary light switch to the "Auto" position and selected high beam using the multifunction stalk on the steering column.

Night View Assist PLUS with new function for highlighting pedestrians on the display

The Night View Assist Plus system likewise available for the S-Class uses infrared technology to enhance the driver's range of vision when the main beams cannot be used: two separate headlamps illuminate the road with invisible, non-dazzling **infrared light**. A windscreen-mounted camera designed to pick up precisely this type of light records what happens in front of the car and sends the image to a display in the instrument cluster. The clear, needle-sharp greyscale image that appears here shows the scene in front of the car, allowing the driver to see pedestrians, cyclists or obstacles on the road at an early stage.

Night View Assist Plus features special pedestrian detection

The latest development stage of the Night View Assist features special a special **pedestrian-detection** function: as soon as the system detects

pedestrians ahead of the car, they are highlighted on the display to make it easier for the driver to see them.

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Lane Keeping Assist gives a warning if the vehicle leaves its lane unintentionally

As a further system that "looks ahead", the newly developed Lane Keeping Assist is available for the 2009 S-Class. Vehicles leaving the road unintentionally is the cause of one in six serious accidents on German roads. More than one third of all traffic fatalities are victims of such accidents.

The centrepiece of this new technology is a camera on the inside of the windscreen, which is able to recognise clear lane markings by evaluating the contrasting images of the road surface and the markings. The image processing system informs an electronic control unit, which determines the position of the vehicle and recognises when the vehicle leaves its lane to the right or left unintentionally. Unlike conventional systems of this kind, the Mercedes system is able to evaluate the driver's activities as well, and can reliably ascertain whether the car is leaving its lane intentionally or not. There is therefore no warning if the driver e.g. accelerates before overtaking or joining a motorway, brakes heavily or enters a bend.

If the system determines that the car is leaving its lane unintentionally, it **activates an electric motor, causing the steering wheel to vibrate** – a discreet yet highly effective way of prompting the driver to countersteer. The timing of the warning depends on the width of the road and the type of lane markings. If the car crosses over a continuous line on the road, as opposed to a broken one, the system emits its warning earlier.

Lane Keeping Assist operates at speeds of between 60 and 250 km/h, as soon as the system has detected a lane marking. The steering wheel does not vibrate to give a warning if the driver:

- cuts a corner intentionally

- uses the turn indicators
- moves back into the original lane after overtaking

Furthermore, Lane Keeping Assist is deactivated immediately if ABS, ESP®, Brake Assist or another safety system intervenes.

ATTENTION ASSIST is able to warn the driver before potentially fatal micro-sleep occurs

The attention of Mercedes-Benz accident researchers is also directed towards the dangers of micro-sleep at the wheel. Scientific studies have concluded that around 25 percent of all serious motorway accidents are caused by drowsy drivers. Accordingly this accident cause is even more significant than drinking and driving. The ATTENTION ASSIST system installed in the 2009 S-Class **as standard** is able to recognise the typical signs of drowsiness and warn the driver early on that it is time to take a break.

The risk of falling asleep momentarily is at its greatest on long-distance journeys in the dark or in unchanging conditions because this is when drivers are most likely to suffer a lapse in attention. The sheer monotony further heightens the risk of falling asleep at the wheel. Studies show that, after just four hours of non-stop driving, reaction times can be up to 50 percent slower. So the risk of an accident doubles during this time. And the risk increases more than eight-fold after just six hours of non-stop driving!

ATTENTION ASSIST observes the driver's behaviour and, at the start of every trip, produces an **individual driver profile** that is then continuously compared with current sensor data. This permanent form of monitoring is important for detecting the floating transition from awakesness to drowsiness and for warning the driver in plenty of time. The system is active at speeds of between 80 and 180 km/h.

Steering behaviour as the key indicator of drowsiness

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As well as the speed, lateral acceleration and longitudinal acceleration, the Mercedes system detects **steering wheel movements, use of the turn indicators or pedals** and certain control inputs, and takes into account external influences such as crosswinds or road unevenness, for example.

ATTENTION ASSIST monitors **more than 70 different parameters**.

Observation of steering behaviour has proven to be extremely meaningful, as drowsy drivers find it difficult to steer a precise course in their lane and show a characteristic steering behaviour pattern. Intensive tests carried out by Mercedes engineers, involving more than 550 drivers, show that this effect occurs at a very early stage when drowsiness kicks in – often before the dangerous situation in which the driver falls asleep momentarily (microsleep phase).

The crucial element of the Mercedes system is a high-resolution sensor which enables precise monitoring of steering movements and steering speed. Based on these data, ATTENTION ASSIST calculates an individual behavioural pattern during the first few minutes of every trip. This pattern is then continuously compared with the current steering behaviour and the current driving situation, courtesy of the vehicle's electronic control unit. This process allows the system to detect typical indicators of drowsiness and warn the driver by emitting an audible signal and flashing up an unequivocal instruction on the display in the instrument cluster: "ATTENTION ASSIST. Take a break!"

Blind Spot Assist: radar sensors warn against dangerous lane-changes

In addition to the latest camera and image processing technology, **innovative radar technology** makes a major contribution to accident prevention in the 2009 S-Class. Blind Spot Assist is a prime example: first

introduced in the S-Class in 2007, this system warns the driver once it recognises that a lane-change is too dangerous. In Germany alone, more than 9500 serious accidents occur each year because drivers change lanes without taking following traffic into account, or make mistakes when returning to their lane.

The Blind Spot Assist detects the area immediately adjacent to and behind the vehicle with the aid of radars.

This Mercedes system available for the S-Class as part of the **Driving Assistance package** can help drivers to change lanes safely: **short-range radar sensors** housed on both sides of the rear bumper monitor the areas directly alongside and behind the car. This process enables them to see if there is another vehicle in the next lane – in the so-called blind spot. In such situations, the system informs the driver by illuminating a **red warning symbol in the lens of the exterior mirror**. If the driver fails to see this warning and indicates to change lanes, a warning signal sounds as well.

DISTRONIC PLUS: keeping a safe distance with the help of radar

DISTRONIC PLUS proximity control and Brake Assist (BAS) PLUS are two more radar-based Mercedes-Benz assistance systems standard for the S-Class. An analysis by Mercedes-Benz accident researchers has shown that **an average of one fifth of all rear-end collisions could be prevented** with this technology in Germany alone. In a further one quarter of these cases, the systems can significantly help to mitigate the severity of the accident. Interaction between radar and brake technology has the greatest safety potential of all on motorways, where around 36 percent of all rear-end collisions could be prevented.

DISTRONIC PLUS proximity control operates at **speeds of between 0 and 200 km/h**: it keeps the car a set distance behind the vehicle in front, applies the brakes as required and can even bring the car **to a complete halt**, depending on the traffic situation. If the gap to the vehicle in front narrows

too quickly, the system gives the driver an audible warning and, as soon as this first warning signal sounds, automatically calculates the brake pressure required to prevent a collision in this situation. DISTRONIC PLUS is part of the **Driving Assistance package**.

Brake Assist (BAS) PLUS "looks ahead"

Brake Assist (BAS) PLUS detects the distance to vehicles in front and in the event of an impending rear-end collision calculates the necessary degree of braking assistance. If the driver does then in fact apply the brakes, either because traffic is building up or he has been warned by the PRE-SAFE® Brake, in fractions of a second the new Brake Assist (BAS) PLUS builds up the brake pressure calculated for the current situation and - if necessary - increases brake pressure up to full brake application.

DISTRONIC PLUS and Brake Assist (BAS) PLUS celebrated their world premiere in the S-Class in 2005. For the 2009 S-Class, Mercedes-Benz has **improved this innovative radar technology even further**.

Situations potentially leading to an accident are recognised by **two short-range radar sensors** behind the front bumper (80-degree scanning angle), which have a range of around 30 metres, and **a long-range radar sensor** in the radiator grille.

Mercedes-Benz has improved the performance of these sensors even further. In the 2009 S-Class, the system uses a newly developed long-range radar sensor with a **range of 200 rather than the previous 150 metres**.

This sensor now also allows **mid-range detection**, monitoring the area up to 60 metres ahead of the car with a scanning angle of 60 degrees. This new technology enables the road ahead to be monitored even more precisely, with better detection of dynamic processes such as a sudden lane-change by a vehicle ahead.

If the driver is distracted, and fails to heed the immediate danger of a rear-end collision and ignores the visual and acoustic warnings, the PRE-SAFE® Brake is able to intervene and **brake the vehicle autonomously**.

This process has two stages:

- Around 1.6 seconds before the calculated impact point – after three audible warning signals – the system initiates **partial braking autonomously** and decelerates the car with around 40 percent of the maximum braking power (approx four m/s²). Designed to supplement the visual and audible warnings, autonomous partial braking gives the driver a further, perceptible signal to act. If the driver then brakes immediately, the **adapted braking force** is made available by the Brake Assist (BAS) PLUS. If the driver swerves, the accident can be avoided at the last moment;
- The 2009 S-Class makes use of the latest development stage of the PRE-SAFE® Brake: if the driver fails to react even after this autonomous partial braking, it is able to activate the **maximum braking pressure** in this second stage in around 0.6 seconds before what is now recognised as an unavoidable accident -- an emergency braking action that can significantly mitigate the severity of the impact. The PRE-SAFE® Brake therefore acts as something like an **"electronic crumple zone"** to give the occupants even greater protection.

The PRE-SAFE® Brake uses the same close-range and long-range radar sensors as DISTRONIC PLUS and Brake Assist (BAS) PLUS. Mercedes-Benz offers all three systems in combination as part of the **Driving Assistance package which is standard for Australian market S-Class**. (In Germany **around 40 percent of S-Class customers** equip their car with this safety technology.)

The PRE-SAFE® Brake greatly reduces the severity of accidents

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Mercedes-Benz has tested the functioning and effectiveness of the PRE-SAFE® Brake in practical trials and in the driving simulator. The practical trials involved around 400 drivers in Germany and the USA, who covered a total of **around one million test kilometres**. Mercedes engineers also conducted a series of tests lasting several weeks and involving 70 drivers in the driving simulator at the Daimler research facility in Berlin. Each of the drivers drove for half an hour and was distracted by an accident on the other side of the road, while at the same time the traffic in front of the car braked suddenly.

The results of the test, which reflects an everyday situation on the road, highlight the safety-enhancing effect of the sophisticated assistance systems: a total of **70 percent** of these test drives remained **accident-free** thanks to the fast reactions of the drivers and the assistance provided by Brake Assist (BAS) PLUS and the PRE-SAFE® Brake. In a third of the simulator tests, those taking part were unable to avoid a crash. In these cases, automatic braking greatly reduced the accident severity. The practical trials conducted by Mercedes engineers showed that the impact speed is reduced by an average of 16 km/h by autonomous PRE-SAFE® braking.

The PRE-SAFE® Brake is active at speeds **of between 30 and 200 km/h** when moving vehicles are detected in front of the car. The system also reacts if the car approaches a stationary queue of traffic, providing the car's speed is below 70 km/h.

Just like the airbag, seat-belt tensioner, ESP® and other trailblazing Mercedes inventions, the PRE-SAFE® Brake was developed based primarily on **real accident situations**. When used in combination with Brake Assist (BAS) PLUS, this technology can make a key contribution towards reducing the high number of rear-end collisions or reduce the

severity of such collisions. In Germany, over 17 percent of all serious road accidents involve rear-end collisions. In the USA, one in three road accidents involving deaths or injuries are rear-end collisions.

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PRE-SAFE® reduces the forces acting on occupants during accidents by up to 40 percent

The PRE-SAFE® Brake component of the preventive occupant protection system PRE-SAFE®, which is **standard equipment** in the Mercedes-Benz S-Class, immediately takes protective action when the system recognises the danger of an accident. This intelligent Mercedes system, which had its world premiere in the S-Class in 2002 and has been continuously improved ever since, takes its lead from Nature: just as living creatures react reflexively and seek cover when danger threatens, PRE-SAFE® activates **precautionary measures** for the passengers. When PRE-SAFE®, for example, detects that skidding is imminent, the driver brakes sharply or the PRE-SAFE® Brake has intervened, the system tensions the front seat belts, moves the front passenger seat into the most favourable position and automatically begins to close the side windows and sliding sunroof if appropriate. The position of the electrically adjustable, individual rear seats is also improved.

PRE - SAFE ® can also be activated if the Brake Assist (BAS) PLUS has used the radar system to predict an impending collision and a certain level of deceleration is exceeded when braking. The occupants are prepared for the potential collision by preventive tensioning of the front seat belts and repositioning of the front-passenger seat, enabling the seat belts and airbags to offer the best possible protection.

As another PRE-SAFE® measure, the optional rear **multicontour seats** (part of Rear Seat Comfort package and standard on S 63 AMG, S 600 & S 65 AMG) and further developed active multicontour front seats (part of Front Seat Comfort package and standard on S 63 AMG, S 600 & S 65 AMG) enable the driver and front passenger to be seated even more securely,

thereby limiting dangerous whiplash movements by the upper body. If the PRE-SAFE® control unit detects a critical driving situation, it instantly activates the air chambers in the seat cushions and backrests. These then envelope the seat occupants and give them support. Tests at the Mercedes-Benz Technology Centre have shown that this PRE-SAFE® function and preventive belt tensioning increases the distance between the shoulder and the inner door lining by up to 40 millimetres at a lateral acceleration of 0.6 g. This enables the sidebag to fulfil its protective function even more effectively.

The aim is to prepare the occupants and the car for an imminent collision, so that the seat belts and the airbags can deploy with maximum effect in the event of an impact. What's more, the PRE-SAFE® protective measures are reversible: if the accident is averted, the advance tensioning of the seat belts is halted automatically and the occupants are able to reset the positions of the other systems. The anticipatory occupant protection system is then ready for action again straightaway.

Early accident detection is possible because PRE-SAFE® is an intelligent synergy of active and passive safety. It is linked to Brake Assist (BAS), the Electronic Stability Program (ESP®), Brake Assist (BAS) PLUS (optional), the PRE-SAFE® Brake (optional) and the short-range sensors of the DISTRONIC PLUS (optional). The sensors of these systems detect potentially critical situations and send the relevant information to the electronic control units within a matter of milliseconds. PRE-SAFE® also uses these sensor data for anticipatory occupant protection.

In the 2009 S-Class, in combination with the improved DISTRONIC PLUS and Brake Assist (BAS) PLUS, PRE-SAFE® also uses the **information provided by the short-range radar sensors** in the front bumper to tension the front seat belts at the very last moment before an unavoidable collision, thus reducing the forces exerted on the driver and front passenger during the crash. This PRE-SAFE® function is literally the "last resort" in anticipatory occupant protection, since the accident occurs around 200

milliseconds later. This means that the S-Class has opened up yet another new dimension in passenger car safety.

Belt tensioning reduces the forces exerted on the occupants by up to 40 percent

Analyses performed during crash tests show just how important and effective anticipatory occupant protection can be. In the case of belt tensioning, for example, the precautionary measures mean that the driver and front passenger are held in their seats in the best possible position and so do not move forwards as much in the event of an impact, thus reducing the load exerted on the head and neck area. These tests showed that the head was subjected to around 30 per cent less stress, while the Mercedes engineers recorded a reduction of around 40 per cent in the neck area.

PRE-SAFE®	Additional PRE-SAFE® measures when the danger of a skid is recognised
· Driver and front-passenger seat belts are tensioned	· Side windows at the front and rear are closed
· Front-passenger seat is moved backwards or forwards into the optimum position whilst the cushion angle and backrest inclination are also optimised	· The sunroof is closed
· The bolsters in the seat cushions and backrests of the active multicontour front seats* are inflated	

*depending on equipment fitted

PARKTRONIC with Parking Guidance makes slow manoeuvring easier

A newly developed system that can help the S-Class driver to **park** safely works on the basis of ultrasonic technology: sideways inclined sensors on

the front bumper record the length of a parking space as the car drives past it (at a speed of up to 35 km/h), and indicate on the cockpit display whether the space is large enough to park in. The space must be at least 1.3 metres longer than the car.

After reverse gear has been engaged, instructions for safe parking appear on the display in the instrument cluster. Parking Guidance replaces the previous Parking Assist with radar sensors.

The well-proven Mercedes system **PARKTRONIC**, which indicates the distance between the S-Class and an obstacle or other vehicle by means of visual and acoustic signals when parking, is also in action to assist the driver when Parking Guidance is active. As a further parking and manoeuvring aid, Mercedes-Benz offers a **reversing camera** that monitors the area behind the saloon and shows it in the COMAND display on the dashboard.

The driver assistance systems for the S-Class at a glance:

ABS	Standard: ensures that the car remains steerable, even when braking.
ESP®	Standard: reduces the risk of skidding and stabilises the car.
Brake Assist	Standard: provides full braking power almost instantaneously in the event of an emergency stop.
ATTENTION ASSIST	Standard: is able to recognise signs of drowsiness by analysing driver behaviour, and warn the driver.
Intelligent Light System	Standard: incorporates five light functions specially configured for typical driving situations and weather conditions.
Adaptive Highbeam	Standard in combination with the Intelligent

Assist	Light System: detects vehicles ahead or oncoming vehicles with their lights on, and provides the optimum headlamp range.
Lane Keeping Assist	Standard: detects clear carriageway markings and warns the driver if the vehicle leaves the recognised lane unintentionally.
Blind Spot Assist	Standard: uses radar to monitor the areas to the sides and rear of the S-Class, and warns the driver if it detects another vehicle in the exterior mirror's blind spot.
DISTRONIC PLUS	Standard: uses radar to automatically maintain a desired distance between the S-Class and the vehicle in front, and warns the driver if the gap narrows rapidly.
Brake Assist PLUS (in conjunction with the close-range sensors of DISTRONIC PLUS)	Standard: uses radar sensors to detect an imminent rear-end collision and calculates the necessary level of braking assistance.
PRE-SAFE®Brake (in conjunction with the close-range sensors of DISTRONIC PLUS)	Standard: initiates partial or emergency braking automatically if there is an acute risk of an accident and the driver fails to react.
PARKTRONIC with Parking Guidance	Standard: ultrasonic sensors measure the length of parking spaces as the car drives past; instructions for safe parking appear in the display.
Active Body Control (ABC) with crosswind stabilisation	Optional for S 500 (standard for S 63 AMG, S 600 & S 65 AMG): active suspension system that adapts the springs to the current driving situation within fractions of a second, and is able to largely compensate for the effects of crosswinds.

If the accident is unavoidable, a powerful restraint system goes into action to protect the occupants in a way appropriate to the need and the situation. Using various sensors, a computer evaluates not only the seriousness of the accident, but also personal data describing the front-seat passenger. If the sensor in the seat cushion has identified a small passenger, and depending on the type of accident, it initially deploys only the first airbag stage so that the air cushion is less fully inflated. If it detects a larger passenger, however, both airbag stages are deployed.

In addition, the S-Class comes with the proven automatic child seat identification feature that deactivates the front passenger seat airbag when a special Mercedes-Benz child seat with transponder has been recognized.

Eleven sensors for accident detection

The S-Class has a total of eleven installed sensors that provide immediate data on the type and seriousness of a collision:

- **Frontal impact:** In addition to the central sensor in the airbag control unit, the S-Class is equipped with “up-front” sensors. Because of their exposed position in the front module, they detect the strength of an impact even earlier and with even more precision, so that the time between the crash and the activation of airbags and seat-belt tensioners can be reduced even further.
- **Side impact:** pressure sensors relay rapid, precise information to the control unit in the event of an impact from the side in the area of the doors. These sensors react when the air between the doors' outer skin and inner lining is compressed on impact. Additional side sensors are installed in the B-pillars of the new S-Class.
- **Rear impact:** The central crash sensor in the interior of the S-Class detects a rear-end collision and supplies the information needed to activate the NECK-PRO headrests. If the accident is relatively major,

the pyrotechnical belt tensioners are triggered in the front and rear to fix the occupants in their seats. Page 57

- **Rollover:** In side rollovers, a rollover sensor integrated into the airbag control unit can activate the seat-belt tensioners and windowbags.

Nine airbags as standard

With nine airbags fitted as standard, not to mention seat-belt tensioners, belt-force limiters and NECK-PRO crash-responsive head restraints for the driver and front passenger, the 2009 S-Class offers an even more extensive package of safety equipment than its predecessor. The airbags, which deploy in a matter of milliseconds in the event of an accident, for the first time include a **kneebag for the driver** plus two adaptive airbags for the driver and front passenger, two sidebags in the front-seat backrests and two large windowbags which extend from the A-pillar to the C-pillar during a side impact. Rear sidebags can be ordered as optional extras.

Seat-belt force limiters for front and rear passengers

All the passengers have three-point automatic seat belts. The driver and front passenger seats and the outer seats in the rear are also equipped with seat-belt tensioners and belt force limiters. The force limiter of the front belt straps is adaptive: after attaining a certain maximum level of force, the force limiters switch to a lower level of force – the belts are loosened so that front passengers can plunge deeper into the airbags. This reduces the loads acting on the chest area of the occupants.

The steering column serves the same purpose. During a front-end impact, it collapses telescopically by up to 80 millimetres.

The occupant restraint system of the S-Class at a glance:

	Front seats	Rear seats
Three-point seat belts with automatic belt height adjustment	With automatic belt comfort function	Standard
Belt tensioners	Buckle retractor	Inertia-reel tensioners
Belt-force limiters	Adaptive	For the outer seats
Headrest height and angle adjustable	Crash-responsive NECK-PRO head restraints as standard	Standard
Front airbags	With adaptive control on the front passenger side incl. customization	Standard
Sidebags	Standard	Standard
Windowbags	Standard	Standard
Kneebag	On the driver's side	N/A

Sophisticated bodyshell design for high crash-resistance

The basis for the exemplary level of occupant protection is an intelligently designed bodyshell with large deformation zones at the front and rear ends.

Around one half of all the components making up the bodyshell of the S-Class are of high or ultra high-strength **high-tech steel alloys**, which offer the maximum strength for the minimum weight. This is a top-class figure in passenger car engineering. The bonnet, front wings, doors, boot lid and other components are of aluminium.

The front module and the frame-type integral support, to which the engine, front axle and steering are attached, connect the front side members with the second side member plane above the wheel housings. During a frontal

collision, this gives rise to two **important paths along which forces and loads are transmitted**, which is one of the major reasons for the exemplary passenger protection of the S-Class. Similarly, the solid, multi-layer side skirts can absorb large forces and divert the impact energy past the passenger compartment.

The **continuous firewall cross member** distributes the impact forces over a large area, into the centre tunnel and the longitudinal members at the sides. An additional upper member increases the rigidity of the firewall and reduces the extent to which the pedals are pushed into the passenger compartment during a front impact.

Practically undeformable: the passenger compartment

The passenger cell is a structure virtually immune to deformation which keeps the passengers' survival space intact, even at high impact speeds, regardless of whether the collision is head-on, from the rear or from the side, or whether the vehicle rolls over. The use of high-strength steel and thicker panels plays as important a role here as the installation of additional load-bearing members.

A complex and carefully designed floor structure forms the sturdy foundation for comprehensive occupant protection. Eight side member sections, four cross members and a three-part tunnel reinforcement stabilize the passenger compartment in a crash, and ensure that impact forces are distributed over a large area.

Side structure made of ultra high-strength steel

In a side impact, the main elements that come into play to stabilize the passenger compartment are the sturdy side skirts, the B-pillars, the four cross members in the floor area and a solid steel section below the dashboard. Mercedes-Benz produces the sills and B-pillars using ultra high-strength steel alloys, which are far superior to all other materials in terms of

their tensile strength. Side impact protection is also provided by steel reinforcing sections with a high tensile strength in the doors.

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At the rear the passenger compartment is protected by a **meticulously designed deformation zone**. In addition to the aluminium transverse section and the steel crash boxes of the bolted rear module, this consists of two sturdy side members and a cross member in the area of the boot floor. The suspension sub-frame of the rear axle likewise forms an energy-absorbing plane in the event of an impact. The fuel tank is located in the protected area in front of the rear axle. Even with respect to rear-end protection, this means that the S-Class meets the world's most stringent crash test standards such as the US test according to FMVSS301 at 80 km/h.



Design and equipment: Perfection to the last detail

- **Appearance: modified radiator grille and new bumpers**
- **Light: unmistakable night design with the LED Light package**
- **Seats: new dimension in comfort based on the well-proven Mercedes philosophy**
- **Infotainment: COMAND APS with even more functions**

Modern but not fashion-driven – the S-Class represents the hallmark of Mercedes design, and stands for perfection down to the last detail in this discipline too. The unmistakable visual appearance of the flagship Mercedes model communicates progressiveness, dynamism and emotional appeal, but also prestige, physical presence and high formal value retention. As part of the model facelift, Mercedes-Benz designers have added yet more edge to the appearance of the S-Class. The modified front-end design reflects the superiority and power of the luxury saloon without appearing aggressive. This effect is heightened by the more pronounced arrow-shape of the radiator grille, which has four louvres in the six and eight-cylinder models and three twin louvres in the twelve-cylinder S 600 – updated interpretations of the classic Mercedes face.

Unmistakable look: the headlamps

The headlamps likewise make their mark from afar: their external contours remain unchanged, however the internal components and their layout have changed dramatically. This is because the S-Class is now equipped with the high-quality **LED Light package** for the S-Class, which literally adds sparkling highlights. This includes the Intelligent Light System, Adaptive Highbeam Assist and two seven-section LED strips for the daytime driving lights in the right and left of the front apron, which underline the high-tech character of the saloon. These are supplemented with two additional LED strips on the undersides of the main headlamps for the indicators and

driving lights. Together with the dimmed daytime driving lights, these ensure an eye-catching and unmistakable night design. Page 62

The redesigned front bumper now features a discreet light-catching contour and a continuous chrome trim strip below the cooling air intakes. Like the daytime driving lights in their outside positions, both design features lend the 2009 S-Class a wider, more dominant appearance. At the same time the new bumper design increases the overall length of the Mercedes-Benz flagship model by 20 millimetres to 5069 and 5226 mm (long-wheelbase version).

Luxury saloon with outstanding aerodynamics

A better view to the rear is provided by the slightly larger exterior mirrors, while the integrated LED indicator repeaters have a modified design with a fine centre division. The optimised shape of the **mirror housings** as a result of intensive fine-tuning in the wind tunnel ensures that the side windows hardly become soiled in poor driving conditions, and that wind noise - especially from crosswinds and when overtaking trucks - is substantially eliminated. There is another benefit: although the larger mirror housings increase the width of the S-Class by seven millimetres to 2120 millimetres, there is an overall improvement in the saloon's aerodynamics with the drag coefficient reduced to $C_d = 0.27$.

The S 350 BLUE EFFICIENCY is additionally equipped with aerodynamically advantageous, full-surface underbody panelling that further improves the drag coefficient to $C_d = 0.26$. This is the best figure ever achieved in the long history of the S-Class, and significantly contributes to the exemplary efficiency of the Mercedes flagship model.

Other contributing factors include the new exterior mirrors, the redesigned drainage channel in the A-pillar, the joint seals between the bonnet and headlamps and the reduced height of the spoiler lip.

	2009 S-Class	Preceding model
Drag coefficient (cd)	0.26 – 0.28	0.27 - 0.28
Frontal area (A) m²	2.4	2.4
Wind resistance (cd x A) m²	0.624 – 0.672	0.648 – 0.627

Tail lights: 52 LEDs for an unmistakable light signature

What strikes you first when looking at the powerfully shaped rear of the vehicle is the new tail light design. The previous horizontal stripes in the vehicle colour have each been replaced by horizontal white light strips for reversing lights and indicators. The tail light design in the form of a double-C creates an unmistakable light signature.

A total of 52 LEDs are used in the 2009 S-Class for the tail lights as well as the indicators and brake lights. They offer distinct advantages over regular bulbs: LEDs use less energy, last for the car's lifetime and can be activated quicker. Given the immediate visibility of the brake light therefore, they also make a significant contribution to safety. By specifying such lights the Mercedes designers and engineers are emphasising that form and function are of equal importance in their eyes.

The discreetly redesigned rear bumper, with its light-catching contour blending into the vehicle flanks and visually extended by an expressive swage line running into the powerfully flared wings, likewise underlines the high design quality of the S-Class. At the same time this feature emphasises the power of the Saloon, suggesting the safety and solidity of its stance on the road. This impression is heightened even further in the twelve-cylinder S 600, which has a chrome trim strip above the exhaust tailpipes. In future the trapezoidal exhaust tailpipes themselves are visibly integrated into the rear bumper in the six and eight-cylinder models as well. For the purpose of visual differentiation, they also feature a vertical division in the S 600.

In the interior too, Mercedes-Benz developers have perfected the S-Class with enormous attention to detail. In addition to visual and tactile enhancements, the focus here was on driver stress relief with further improved seating comfort and the latest infotainment systems – major aspects for a car that is primarily used for long-distance journeys and must offer its occupants the maximum feeling of wellbeing.

The elegant appearance of the S-Class is in large measure due to a perfectly coordinated choice of materials. The interior design specialists have used first-class materials such as aluminium, leather and wood to this end. They have used even more wood for the 2009 S-Class, replacing the polyurethane surface of the front centre console section and cupholder cover with carefully finished wood trim. All in all, depending on the model and interior appointments, there are around 20 different wood trim elements in the interior of the S-Class – most of them hand-made and individually coordinated by specialists according to colour shade and grain.

In the 2009 S-Class, **five different types of wood trim** provide perfectly coordinated material and colour concepts to suit individual tastes. The S 350 & S 350 CDI BlueEFFICIENCY is combined with dark-brown eucalyptus wood. Optionally, light or dark burr walnut (high-gloss) or - exclusively for the S 600 - high-gloss brown poplar are available. The AMG Sports package includes black ash wood trim.

When it comes to colour-coordinating the interior, S-Class customers now have even more choice of personal surroundings. To make the decision-making process easier, Mercedes-Benz designers have developed **three new interior combinations** for the colour scheme: alpaca grey/basalt grey, cashmere beige/savanna beige and chestnut brown/black. Together with an all-black interior for the comfort-oriented business saloon and the well-proven combination of sahara beige/black, this produces a total of five tasteful interior design options.

The seat covers likewise meet the highest standards. In addition to high-quality fabrics there is a choice of **three different leather qualities**. The leather upholstery is relatively loose-fitting, which creates a ruffled effect and immediately appears soft and inviting.

First-class seating comfort

A new 12-way seat already offers the driver and front passenger outstanding comfort even in the standard version. The fore-and-aft position, backrest and cushion angle, seat height, head restraint and seat cushion depth are electrically adjustable – independently and variably, so that each occupant is able to choose the best individual seating position. Pneumatic, two-way lumbar supports are also standard equipment for the front seats. So that the optimal seating position does not have to be changed for another driver or front passenger after being found, the S 500 and S 600 are equipped with a memory function as part of the Memory package as standard. Three memory settings can be stored for both the driver and front passenger.

Climate comfort is likewise enhanced by the optionally available **actively ventilated comfort seats**: a total of six miniature ventilators in the seat cushion and backrest extract cool air from the floor area of the interior and distribute it evenly through a ventilation tissue beneath the seat surface. This gentle airflow prevents the occupants from getting into a sweat even when outside temperatures are very high.

Active multicontour seat: lateral support to suit the driving situation

First-class seating comfort is assured with the optional **active multicontour seats** (standard for S 63 AMG, S 600 & S 65 AMG) available as part of the Front Seat Comfort package. Multicontour means that the occupants are able to adapt the shape of the seat to their anatomy or personal comfort preferences. In the S-Class this is made possible by a total of eleven inflatable air chambers under the upholstery. Three of these chambers,

instead of two previously, provide support for the lumbar area, while as a new feature two now provide support for the shoulder area.

In addition the firmness of the seat can be adjusted by varying the spring and damper characteristics of the seat cushion. The air chambers in the seat cushions can be inflated more or less fully in three stages. The firmness of the seats is programmed using the COMAND Controller and the colour display of the operating system.

In addition, high-speed piezo valves in the air chambers adjust the charging pressure and volume of the air chambers in the side bolsters of the seat backs, depending on the steering angle, lateral acceleration and vehicle speed, to provide both driver and front seat passenger with even greater support. This active function relieves pressure on the muscular system and increases the feeling of wellbeing and safety.

The pneumatics of the multicontour system work quietly, quickly and precisely thanks to high-performance piezo valves, such that the seats can be integrated into the PRE-SAFE® preventive occupant protection system: if the PRE-SAFE® system identifies a critical driving situation, it activates the air cushions of the seat backrests in a split second. They embrace the vehicle occupants and support them in such a way that in the event of an accident, the dangerous whiplash forces of the upper body can be reduced. Mercedes-Benz offers the active multicontour seats as an optional extra, and fits them as standard to the S 63 AMG, S 600 & S 65 AMG.

Comfort head restraints with manually adjustable side bolsters are also included with the active multicontour seat. These also incorporate crash-responsive NECK-PRO technology: in the event of a rear-end collision, the head restraint is immediately moved 44 millimetres forwards and 30 millimetres upwards by a pretensioned spring to give early support to the head of the seat occupant.

Finally, the S-Class represents the state of the art in terms of seating comfort with the **massage pad** in the backrest of the active multicontour seat. This consists of seven air chambers that are cyclically inflated and deflated, so that the seat occupant feels a pleasant rolling sensation over the entire back area. This stimulates the muscles, improves blood circulation and helps to prevent early fatigue. The massage pad operates independently of the contour and lumbar support settings. Four massage programmes are available, from "slow and gentle" to "fast and strong".

Multicontour seats with the massage function, awarded the "Healthy Back Action" seal of approval, as well as the PRE-SAFE® positioning function are also available for the rear seats of the S-Class on request. This requires the rear seat unit with electrically adjustable outer seats, which is standard equipment in models with the long wheelbase. There is a choice of two massage programmes.

New steering wheel with a sporty look

The **multifunction steering wheel** of the S-Class has also been carefully modified by the Mercedes-Benz designers: in future the rim and airbag module are lined with soft nappa leather as standard. Customers are also able to order a wood/leather steering wheel as an option, with a choice of four wood types. The new, flatter airbag module also lends a sporty touch to the multifunction steering wheel.

The armrests in the front doors have also been given an updated look: to heighten their perceived value even further, they now have extended chrome trim strips.

Standard equipment with the model change also includes a telephone keypad under the handrest for the COMAND Controller. This also makes it possible to enter radio frequencies, personal points of interest and navigation data.

Ambient lighting heightens the sense of wellbeing

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Mercedes-Benz also makes more use of light as a styling element in the 2009 S-Class, to give its occupants an even more pleasant motoring experience. Two further colour tones have been added to the optional ambient lighting available for the interior. In addition to the "solar" lighting mood in warm amber, customers can now use the COMAND Controller to choose between the new "neutral" in white and "polar" in ice-blue.

The ambient lighting consists of slim optical fibres concealed beneath the wood trim strips in the front and rear doors, as well as the dashboard. Their indirect light can be dimmed in five stages via the COMAND system. With ambient lighting, the pleasant feeling of spaciousness in the S-Class is also retained during journeys at night. Moreover the light keeps the driver alert and creates a relaxed mood, therefore it greatly contributes to driver-fitness safety.

Even in its basic configuration, a sophisticated lighting concept in the S-Class heightens the sense of wellbeing in the dark. In addition to the indirect lighting from the switches and controls, there are lights in the door handle recesses and footwells that create a pleasant, amber-coloured lighting effect. An LED in the housing of the rear-view mirror is directed at the centre console as another component of the interior lighting system.

The diffused light for the front of the car has five dimmer settings and can be adjusted individually using the buttons on the multifunction steering wheel and the central display in the instrument cluster. The brightness of the front and rear footwell lighting automatically dims when the doors are closed. Reading lights are provided for the rear passengers. These are equipped with xenon crown-mirrored bulbs, which produce a bright but non-dazzling light. There are a total of 45 lights in the interior of the S-Class.

In line with its serene character and claim to be the technical trendsetter, the onboard infotainment systems of the 2009 S-Class also set standards in the automobile industry. This already starts with the visual presentation of information: the displays in the instrument cluster and standard control and display system COMAND are like modern LCD television screens with LED backlighting. The result is brilliant colour reproduction and crystal-clear images.

As another advantage, the displays can be viewed from extreme angles with no colour distortion. The displays are black when the ignition is off. In addition to the "classic" information, Mercedes-Benz developers have integrated the warning and control lamps of the new driver assistance systems and the new fuel consumption display into the instrument cluster. S-Class drivers can activate this by selecting the menu item "Trip", and ascertain the current fuel consumption and operating range.

SPLITVIEW: two programmes on a single screen

As a world first Mercedes-Benz will equip its flagship model with the new SPLITVIEW technology for the COMAND APS control and display system centrally located in the centre console. This innovative display concept allows the driver and front passenger to view different content simultaneously on one and the same screen. While the driver e.g. uses the map-based navigation system, the front passenger can be watching the latest film on DVD. For this purpose the SPLITVIEW option includes a remote control unit and wireless headphones.

The generously dimensioned, 8-inch (approx. 20 cm) COMAND screen has a backlighted active matrix colour display (TFT-LCD) in combination with SPLITVIEW. This shows two different images simultaneously by placing pixels adjacent to each other. A filter masking the display divides this mixed image in such a way that depending on the seating position, only the pixels

making up one or the other image can be seen. As a result, the driver and front passenger can view different programmes on the same screen at the same time.

The driver still has access to all the information from the control and display system COMAND in the display. The front passenger is able to choose his own entertainment programme with DVDs, TV channels or music videos, but is also able to operate the telephone and navigation system. As before, he can view all the information provided by the COMAND APS system in the display.

Personal data always to hand during a journey

Mercedes-Benz has also added additional functions to the COMAND system. In future the multimedia head unit with a radio, telephone operation and a CD/DVD player also has a slot for SD memory cards. Another new feature for the COMAND APS system is the **Bluetooth® interface**, which wirelessly connects the mobile phone to the standard hands-free system. The Bluetooth® interface and likewise standard **USB interface** also make it possible for customers to transfer their personal address book from a mobile phone or organizer to the control and display system, where it can be stored for immediate access during a journey. Stored data can also be exported and imported into any other S-Class.

Specific search for a favourite music track

The new **Music Search** function enables S-Class drivers and passengers to search SD memory cards, USB sticks, CDs and DVDs for specific music tracks and artists. The search can be according to various criteria, e.g. album, music category or composer. If a name needs to be entered, the software will also tolerate spelling mistakes. The driver is therefore able to devote his full attention to the road. As a further advantage, the occupants are able to search all the connected media and devices simultaneously.

The **media interface** in the glove compartment is a universal interface for connecting an iPod, USB stick or other external audio devices. All that is required is a suitable cable from the choice of 3 supplied with the vehicle. The interface includes a control unit that links the external music memory to the onboard electronics and control systems. The advantage of this is that the titles of the tracks stored on the iPod can be shown on the colour display in the dashboard and in the instrument cluster, allowing them to be selected almost effortlessly using the Controller or the buttons on the multifunction steering wheel. The battery in the audio device is also charged while it is connected to the car via the media interface.

COMAND APS: HDD navigation for a swift arrival

The infotainment system COMAND APS provides S-Class customers with even more high-end electronics that contribute greatly to a safe and relaxed arrival at their destination. This unit is equipped with an Australia & New Zealand - wide navigation system whose data is stored on a 40 GB hard disc, which makes for even faster route calculation compared to a DVD-based navigation system. The high level of navigating convenience is also aided by a three-dimensional map display.

With COMAND APS the information in a personal address book can also be used for navigation purposes - a significant benefit for S-Class drivers whose professional life is often governed by the time pressure of meetings and appointments. Depending on the structure of the personal address book, the route search can be according to a telephone-number or name. As a particularly important benefit for leasing customers or business travellers using a rented S-Class, the data can be quickly and easily exported to an SD memory card and then imported into another S-Class.

Voice-operated control: whole-word voice input for navigation, telephone and radio

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Mercedes-Benz combines COMAND APS with the voice-operated control system LINGUATRONIC and a so-called text-to-speech function as standard. This makes it possible for route-related traffic reports, SMS messages, address book entries or radio station names to be read out. The system automatically reads out traffic reports that are relevant to the current route.

Mercedes-Benz is among the inventors of modern voice control systems, and has continuously developed its LINGUATRONIC system further in recent years. The voice control system is equally convenient when selecting radio stations or entries from the telephone directory: all the available or stored names can be called up without previously training the voice recognition system. The system also has a stored list of synonyms. For example, the driver does not necessarily have to confirm entries or commands with "Yes", but can also say "Ok", "Right", "Good" or "Correct" instead. A special filter suppresses coughing or clearing the throat, so that a voice command does not need to be repeated. LINGUATRONIC also understands variations in tone and pronunciation due to dialects.

Music Register for 2500 tracks

For musical entertainment COMAND APS includes a radio, a CD/DVD player with MP3 function, an equalizer with speed-dependent volume control and the Music Register with a **7.2 GB hard disc** which stores around 2500 digital music files in the MP3, AAC or WMA format that can be loaded from PC memory cards. The system recognises music files played on CD, DVD or from the Music Register using its stored **Gracenote® database**, and shows the title, album and performer in the colour display.

Comfort telephony for a mobile conference room

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Mercedes-Benz specialists have also added new functions to the comfort telephony option for the 2009 S-Class. The driver and passengers are now able to conduct **telephone conferences** and send or receive SMS messages. Whereas the basic telephony system connects the mobile phone to the control and display system via Bluetooth®, comfort telephony connects the mobile phone to the vehicle via a telephone cradle housed in the compartment beneath the centre armrest. This interface enables the phone to be connected to the vehicle aerial, and its battery is also charged during the journey.

The ultimate listening pleasure and entertainment in the rear too

A growing number of S-Class owners like to enjoy the unrivalled comfort of the Mercedes-Benz flagship model while seated on the luxurious rear seats. To meet the expectations of these customers, Mercedes-Benz has increased the range of the **Rear Seat Entertainment package** (standard S 65 AMG) in the 2009 S-Class.

A remote control unit is available which enables all the audio and telematic functions of COMAND APS to be operated, plus access to external devices via the Media Interface.

In addition, the **Rear Seat Entertainment package** comprises two newly designed eight-inch displays on the rear surfaces of the driver and front seat passenger head restraints, two wireless headphones and a separate CD/DVD player.

The Rear Seat Entertainment package, as well as the optional Front Seat Entertainment package (standard for S 600), also include the Harman Kardon® Logic 7® **surround sound system**, developed by Mercedes-Benz together with the audio specialists, which delivers three-dimensional sound as a natural 360-degree musical experience for all passengers, from both

DVD and CD and regardless of whether the source was recorded in 5.1 surround or normal stereo.

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The audio signals are distributed via a 600-watt amplifier connected to 15 high-performance loudspeakers. For the 2009 S-Class, the sound experts at Harman Kardon® have optimised the amplifier software and equipped the mid-range speakers with Neodym magnets. A tweeter is also installed above the centre loudspeaker. The result is an even better sound experience.

In the surround-sound system for the 2009 S-Class, a 200 x 320-millimetre oval subwoofer on the parcel shelf teams up with another two 200-millimetre bass loudspeakers in the front doors, each of which is flanked by a 100-millimetre mid-range loudspeaker, to deliver high-class bass output. An additional 43-millimetre tweeter sends out the higher frequencies to the left and right in the front. In the centre of the car is a 100-millimetre diameter mid-range speaker and above it the new tweeter, while a 165-millimetre woofer/mid-range speaker and a tweeter are fitted in each of the rear doors. In addition to the powerful subwoofer, another two mid-range speakers in the parcel shelf ensure the interior of the new S-Class is flooded with sound. The amplifier supplies the eleven main channels – centre, front left/right, side left/right and rear left/right – with 40 watts of power each, the door woofers with 80 watts and the subwoofer in the parcel shelf with 160 watts.

As an optional extra, Mercedes-Benz also offers rear-seat occupants a new telephone handset with a colour display, more rapid connections and faster access to the telephone directory stored in memory. The unit is connected to COMAND APS via the Bluetooth® interface.



Chassis and suspension: Safe and relaxed arrival

- **Direct-Steer for outstanding agility and driving pleasure**
- **Torque Vectoring Brake: more stability , more dynamism**
- **New: Active Body Control with crosswind stabilisation**
- **AIRMATIC air suspension with Adaptive Damping System**

The 2009 S-Class not only impresses with its exemplary ride and suspension comfort, but also meets the highest expectations in terms of driving dynamics and agility. This is in large measure due to various new and improved systems such as Direct-Steer, which varies the steering ratio according to the steering angle, and the modified Active Body Control (ABC) with crosswind stabilisation for the eight and twelve-cylinder models.

The basis for the exemplary ride comfort of the Mercedes-Benz S-Class is still the well-proven combination of a four-link front suspension, multi-link independent rear suspension and AIRMATIC air suspension. The intelligent combination of all systems, their precise coordination and their reliable interaction are the reason why Mercedes-Benz holds such a leading position with its flagship model.

More cornering enjoyment and steering precision thanks to the Direct-Steer system

The new Direct-Steer system was developed from the familiar speed-dependent steering that Mercedes-Benz offers for many of its models. In this case the steering effort depends on the vehicle speed – the effort required increases with the speed. In practice this means more steering comfort during parking manoeuvres and more safety at higher speeds, for example on motorways, where a greater steering effort ensures safe straight-line stability.

The new Direct-Steer system retains these positive attributes of speed-sensitive steering and adds a variable steering ratio to them. This changes depending on the steering angle. The ratio is normal when the steering is more or less centred, which makes for good straight-line stability and therefore safety. The steering ratio changes very rapidly to become more direct as soon as the steering angle reaches five degrees, reaching its end value at a steering wheel angle of ninety degrees, where the steering feels very direct. Only relatively small movements of the wheel are then required to make course corrections. With the new Direct-Steer system, the number of turns of the steering wheel required from stop to stop is reduced by around 25 percent.

The perceived effect of Direct-Steer is however even more important than measured data. Even at inner-city speeds the driver needs to turn the wheel less frantically, with changes of direction faster and involving less effort. Winding country roads also become the natural habitat of the Mercedes-Benz luxury saloon equipped with Direct-Steer, as very small steering wheel movements are necessary to steer the car. Rapid sequences of bends can be mastered almost intuitively safely and precisely, and with enormous enjoyment. This all adds up to considerably more agile handling.

Variable steering ratio by mechanical means

Despite its remarkable effect, the key component of the **Direct-Steer system** is simply a steering rack. Its secret lies in the teeth cut into it. Starting from the neutral position for driving straight ahead, they are spaced increasingly further apart. The change in steering ratio is therefore produced by purely mechanical means. With this solution, Mercedes engineers have been able to dispense with the complex actuators and sensor systems used by other variable steering systems. The advantages include very low susceptibility to faults and low weight.

Moreover, the system always responds predictably and in the same way, while other variable steering systems sometimes require rapid adaptation by the driver in rapidly changing situations.

Torque Vectoring Brake: ESP® helps with the steering

Extra safety at the physical limits, as well as even more agility, is provided by the Torque Vectoring Brake in the 2009 S-Class – **targeted, one-sided braking intervention** at the inside rear wheel when cornering. If ESP® detects a tendency to understeer, the newly developed Torque Vectoring Brake generates a defined turning or yawing moment around the vehicle's vertical axis within fractions of a second. Thanks to the different torque distribution that results, the S-Class turns into the bend under precise control without any loss of handling dynamics. The advantage of this solution over complex mechanical components such as an active steering rear axle, additional multi-disc clutches or an active differential: the Torque Vectoring Brake can be implemented without an increase in vehicle weight and therefore no disadvantages in terms of fuel consumption.

This Torque Vectoring Brake function is standard equipment in the 2009 S-Class. The S-Class steers precisely when cornering thanks to targeted braking intervention at the inside rear wheel.

Active Body Control reduces the effect of a crosswind

Mercedes-Benz offers the Active Body Control (ABC) suspension system as an optional extra for the eight-cylinder S 500 model. It is standard equipment for the twelve-cylinder S 600 and the S 63 AMG & S 65 AMG. This system, which adapts the springs to the current driving situation within fractions of a second, has been improved even further for the 2009 S-Class by the suspension engineers with the addition of crosswind stabilisation.

The effect of crosswind is largely compensated by varying the wheel load distribution.

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In strong crosswinds, and depending on the direction and intensity of the wind having an effect on the vehicle, this system varies the wheel load distribution in such a way that the effects of crosswinds are largely compensated or reduced to a minimum. For this purpose the ABC control unit uses the yaw rate, steering angle and lateral acceleration sensors of the Electronic Stability Program ESP® to vary the wheel load distribution via the ABC spring struts.

The system filters out weak crosswind signals, only coming into action when a certain threshold has been exceeded. In this case the driver is assisted by a change in the diagonal wheel load distribution, for example affecting the left front wheel and the right rear wheel. Specialists refer to this as Active Body Control crossover. The resulting steering effect is sufficient to reduce the effect of the crosswind.

Crosswind stabilisation is active at speeds above 80 km/h, when travelling straight ahead or taking gentle corners. If the driver takes purposeful and immediate corrective action himself, the function deactivates itself. Trials with test drivers, in which wind conditions akin to hurricane speed were simulated, elicited a positive response from all those involved.

Technical background to ABC: In this Mercedes-Benz active suspension system, the four spring struts are equipped with microprocessor-controlled plunger cylinders that can almost completely compensate for lifting, rolling and pitching of the body. The computer uses various acceleration sensors to obtain information on the current driving situation, and compares these data with those from the pressure sensors in the spring struts and the level sensors on the control arms. The system then computes the control signals, which the servo-hydraulic valves at the front and rear axle transform into precisely metered oil flows.

Once oil flows into the plunger cylinders, this modifies the tracing point of the steel springs integrated into the spring struts, generating the necessary force

to counteract the body movements. Thanks to a constantly available hydraulic pressure of up to 200 bar, ABC is able to stabilise the body practically instantly, within fractions of a second. Short transfer lines and a fast processor enable the latest development stage of ABC to reduce body roll by 60 percent when cornering at speed.

At speeds between 65 and 140 km/h, ABC gradually lowers the suspension level by up to 15 millimetres to reduce aerodynamic drag. If more ground clearance is required on very poor road surfaces, the S-Class driver is able to raise the suspension level by 40 millimetres at the touch of a button.

AIRMATIC air suspension with Adaptive Damping System

AIRMATIC air suspension is included as standard in the S 350, S 500, and, S 350 CDI BlueEFFICIENCY. Mercedes-Benz combines this with the **Adaptive Damping System (ADS)**, which continuously regulates the shock absorber characteristics and takes the road conditions, driving style and vehicle load into account. The system adapts the damping forces for each individual wheel to the current situation within just 50 milliseconds.

Pressing the "Sport" key to the left of the instrument cluster enables the driver to individually adjust the vehicle level and suspension. In "Comfort" mode the body is automatically lowered by up to 20 millimetres from a speed of 120 km/h, and from 100 km/h in "Sport" mode, so as to improve handling, aerodynamics and fuel economy even further. In addition to this, the driver can change the transmission characteristics of the saloon from "comfortable" to "sporty" using the transmission mode switch ("S", "C" and "M"). In Manual mode the 7G-TRONIC automatic transmission can be shifted manually using the paddles on the steering wheel.

The suspension and transmission mode keys are also on board if the S-Class is equipped with Active Body Control.

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ADAPTIVE BRAKE: high-tech brakes for maximum safety

The Mercedes-Benz S-Class also represents the technological standard where its braking system is concerned: thanks to electronic control, the standard ADAPTIVE BRAKE allows control functions that enhance safety and comfort. These include priming of the braking system in critical situations: when the driver changes abruptly from the accelerator to the brake pedal prior to emergency braking, ADAPTIVE BRAKE increases the pressure in the brake lines to bring the brake linings close to the discs, so that they are able to engage instantly, and with full force when the brake pedal is operated. In this way the system supports the standard Brake Assist and Brake Assist PLUS.

ADAPTIVE BRAKE also has safety benefits in the wet: the system briefly applies the brakes at regular intervals to wipe the film of water from the brake discs and ensure that the brakes are able to perform at their peak. This automatic brake drying function is always activated when the windscreen wipers have been operating for a certain length of time. The finely metered brake pulses are imperceptible to the driver.

After the S-Class has been braked to a standstill, briefly pressing the brake pedal a little further is all that is required to activate the HOLD function. The car is then held by the brakes, even if the driver's foot comes off the brake pedal. In this way ADAPTIVE BRAKE prevents the car from rolling forward inadvertently when stopped at traffic lights or stuck in stop-and-go traffic, and from rolling back when facing a slope. The HOLD function is deactivated automatically when the car moves off.

Extra-large brakes guarantee maximum deceleration

Large brake discs at the front and rear provide the technological basis for safe and reliable deceleration using ADAPTIVE BRAKE. Depending on the engine installed, the disc diameters range up to 360 mm at the front and up to 330 mm at the rear. The front brake discs are perforated for all model variants. The perforations shed moisture and dirt, which increases the brakes' reliability and maintains their excellent deceleration values even in inclement weather conditions. A 9.5-inch tandem brake booster satisfies high standards for responsiveness and ease of use.

The brake data for the S-Class at a glance:

Front	S 350, S 350 CDI BlueEFFICIENCY	S 500	S 600
Brake calliper	4-piston fixed calliper	4-piston fixed calliper	8-piston fixed calliper
Brake disc lining area	2 x 77 cm ² Internally ventilated, perforated	2 x 77 cm ² Internally ventilated, perforated	4 x 54 cm ² Internally ventilated, perforated
Diameter	335 mm	350 mm	360 mm
Thickness	32 mm	32 mm	36 mm
Rear			
Brake calliper	1-piston floating calliper	1-piston floating calliper	4-piston fixed calliper
Brake disc lining area	2 x 38 cm ² Solid	2 x 38 cm ² Internally ventilated	2 x 48 cm ² Internally ventilated,
Diameter	300 mm	320 mm	330 mm
Thickness	12 mm	24 mm	26 mm

The S-Class also features an extremely easy-to-use electric parking brake as standard. Pressing a button on the dashboard is all that is needed to activate the brake. If the driver engages a gear and drives off, the brake is automatically released. The key components of this system are two separate servo drum brakes on the rear wheels and an electric motor with speed-reducing gear that applies the brake clips by means of cables. The electric parking brake can also be engaged if the engine is switched off.

Wide choice of wheel/tyre combinations

New light-alloy wheels ensure that the Mercedes-Benz flagship model impresses with an even more dynamic appearance. The V6 saloons are shod with 18-inch wheels in a five-spoke design, while the V8 models have 19-inch wheels with nine twin-spokes. The twelve-cylinder S 600 is fitted with 19-inch multi-spoke wheels of different widths as standard (front: 8.5-inch; rear: 9.5-inch).

The tyre pressures are monitored by the standard Electronic Stability Program ESP® or, on request, the electronic tyre pressure monitoring system. Should a puncture nonetheless occur, all S-Class models are equipped with a full size spare wheel.

- ENDS -

Internet sites:

Further information from Daimler is available on the internet at www.media.daimler.com

Further information from Mercedes-Benz is available on the internet at www.mercedes-benz.com.au