The new Mercedes-Benz SLS AMG

Press Information

July 2010

Contents **Page**

Mercedes-Benz Australia/Pacific Corporate Communications
A Daimler Company

New legend with unrivalled performance – the Gullwing super sports car from Mercedes-Benz and AMG

Sydney – Automotive fascination and high-tech at the highest level: the new Mercedes-Benz SLS AMG, makes its Australian debut. This Gullwing model captivates with a purist design, intelligent lightweight construction and superior handling dynamics, and is bound to cause a sensation in the super sports car segment. The new SLS AMG is nothing short of a masterpiece by Mercedes-AMG GmbH. As the first independently developed vehicle, the super sports car is the highlight in the company's more than 40-year history. It not only takes AMG, the performance brand within Mercedes-Benz Cars, into a new era, but also demonstrates development expertise of the very highest order.

The new super sports car from Mercedes-Benz and AMG makes for an alluring proposition with its unrivalled technology package: aluminium spaceframe body with Gullwing doors, AMG 6.3-litre V8 front-mid-engine developing 420 kW/650 Nm of torque and dry sump lubrication, seven-speed double-declutch transmission in a transaxle configuration, sports suspension with aluminium double wishbones and a kerb weight of 1620 kilograms based on the DIN standard – this superlative combination guarantees driving dynamics of the highest order. The front/rear weight distribution of 47 to 53 percent and the vehicle's low centre of gravity are testimony to the uncompromising sports car concept. The 'Gullwing' accelerates from 0 to 100 km/h in 3.8 seconds, before going on to a top speed of 317 km/h (electronically limited). The fuel consumption of 13.3 litres per 100 kilometres (combined) puts it at the front of the competitive lineup.

Design: purist, distinctive and passionate

The purist design of the new Mercedes-Benz SLS AMG captivates by virtue of its passionate sportiness and its reinterpretation of the Mercedes-Benz 300 SL's breathtaking design lines. The stylistic highlights are the striking gullwing doors,

which lend an incomparable charisma to the SLS AMG. The long bonnet, the low greenhouse positioned well to the rear and the short rear end with its extendable rear aerofoil stand for dynamism, as do the long wheelbase, the wide track and large 19 and 20-inch wheels. It is not only the gullwing doors that are reminiscent of the Mercedes-Benz 300 SL, as the wide radiator grille with its large Mercedes star, the wing-shaped cross fin and the fins on the bonnet and flanks also hark back to the legendary sports car of the 1950s.

Eyecatching features of the side view include the accented wheel arches and the pronounced shoulder line, which extends from the front to the rear end like a taut muscle. Dynamism and power are also communicated by the rear view of the SLS AMG: the gentle slope of the boot lid with the automatically extending aerofoil accentuates the impression of width, as do the flat LED tail lights.

Interior with a touch of aircraft engineering

Mercedes-Benz designers took their inspiration from the aviation world when designing the interior. The stylistic centrepiece is the dashboard, which ensures a visual impression of breadth with its muscular, wing-like profile. The four air vents with adjustable cruciform nozzles are prominently integrated into the dashboard – their shape is reminiscent of a jet engine. The design theme of an aircraft cockpit is also reflected in the long centre console of carbon fibre. Features integrated into this include the AMG DRIVE UNIT, which enables the driver of the SLS AMG to choose a personal vehicle setup. The AMG SPEEDSHIFT DCT 7-speed sports transmission is operated by the E-SELECT lever, which resembles the thrust control of a jet aircraft. Despite the low seating position typical of a sports car, the wide-opening gullwing doors allow easy access and egress. They require less opening space than conventional coupé doors, and can be fully opened in a standard-size garage.

Aluminium spaceframe for lightweight design and high strength

The SLS also breaks the mould when it comes to the body concept: for the first time, Mercedes-Benz and AMG are presenting a car with an aluminium chassis and body. Compared with the traditional steel design this results in a significant

weight saving, as is clearly illustrated by the DIN kerb weight of 1620 kilograms.

The newly developed bodyshell consists of an aluminium spaceframe. This exclusive design combines intelligent lightweight design with outstanding strength – thus delivering superlative driving dynamics. Lightweight aluminium sections connect the frame nodes to form a sturdy structure. The large, low-set cross-sections of these aluminium sections ensure high strength, and ensure the necessary, direct transfer of drive, braking and suspension forces. The structure prevents unwanted flexibility; the vehicle responds rigidly, directly and with practically no torsion.

45 percent of the intelligent, weight-optimised aluminium spaceframe is made from aluminium sections, 31 percent from sheet aluminium, 20 percent from cast aluminium and 4 percent from steel. Maximum occupant safety requires the use of ultra-high-strength, heat-formed steel in the A-pillars. The bodyshell weighs 241 kilograms – an absolute benchmark in the super sports car segment in relation to the peak output of 420 kW.

Low centre of gravity and transverse reinforcing struts for superb dynamism

The entire vehicle concept has been designed to achieve a centre of gravity that is as low as possible. This applies both to the low connection of the powertrain and axles as well as to the arrangement of the rigidity-related bodyshell structure. Examples include the rigid flexural and torque connections between the front and rear sections and the safety passenger cell, which have been realised using force paths that are consistently as low as possible. This results not only in a low centre of gravity, but also in a harmonious and therefore efficient force path in the vehicle structure.

Passive safety at a high level

The aluminium spaceframe provides the basis for outstanding passive safety. The extensive safety features include three-point seat belts with belt tensioners and belt force limiters, and eight airbags: adaptive front airbags for the driver and passenger, a kneebag for each, two seat-integrated sidebags and two windowbags deploying from the waistlines of the gullwing doors.

Fine-tuned AMG 6.3-litre V8 engine developing 420 kW

A powerful eight-cylinder Mercedes-AMG engine forms the heart of the new SLS. The fine-tuned 6.3-litre V8 engine develops 420 kW at 6800 rpm, making the SLS AMG one of the most powerful sports cars in its segment. A power-to-weight ratio of 3.86 kg/kW comes courtesy of the low vehicle weight. The naturally aspirated engine delivers its maximum torque of 650 Nm at 4750 rpm. The SLS accelerates from 0 to 100 km/h in 3.8 seconds, and has an electronically limited top speed of 317 km/h. Bearing the internal designation M 159, the high-revving V8 engine with its displacement of 6208 cubic centimetres has been thoroughly reengineered compared to the basic M 156 engine, and boasts all the hallmarks of powerful racing engines.

The principal measures in increasing output include the all-new intake system, the reworked valve train and camshafts, the use of flow-optimised tubular steel headers and the dethrottling of the exhaust system. This results in much better cylinder charging, which feeds through into an increase in output by almost nine percent – 34 kW. The eight-cylinder engine responds swiftly to movements of the accelerator pedal, demonstrating much more pronounced high-revving flexibility across the entire rev range. The switch to dry sump lubrication also translates into a much lower installed engine position. And lowering the vehicle's centre of gravity has also paved the way for high lateral acceleration and exhilarating driving dynamics.

Perfect synthesis of lightweight design and strength

The use of high-strength components compensates for the increased engine loads associated with the higher output. Forged pistons, a reinforced crankshaft bearing, optimised crankcase structure, along with improved lubrication thanks to a demand-controlled, high-performance oil pump ensure optimum durability. Despite these higher loads, the engine weight for the M 159 has been further reduced. The forged pistons as oscillating masses play a particularly valuable role in this respect, resulting in a kerb weight of 206 kilograms and, in turn, a power-to-weight ratio of 0.49 kg/kW – an unrivalled figure compared with the competition. Sophisticated catalytic converter technology enables current and future exhaust emission standards such as EU 5, LEV 2 and ULEV to be met.

Enables demanding fuel consumption targets to be met

Despite its uncompromisingly sporty character, very ambitious fuel consumption targets have been met. The SLS AMG consumes 13.3 litres per 100 kilometres (combined), earning it a place at the top of the competitive ranking. Efficiency-enhancing measures include the familiar AMG-exclusive, friction-optimised twin-wire arc-sprayed coating on the cylinder walls as well as the on-demand, map-optimised oil supply and intelligent generator management: during the engine's overrun phases and braking, kinetic energy is used to charge the battery, rather than being wasted by simply generating heat. Conversely, the generator is switched to no-load operation during acceleration, thus reducing the load on the engine.

Double-declutch transmission with transaxle configuration and torque tube

The AMG 6.3-litre V8 engine delivers its abundant power to the rear axle via an ultra-light carbon-fibre driveshaft – similar to the setup used in the DTM C-Class racing touring car. The double-declutch transmission is mounted at the rear (transaxle principle), and connected to the engine housing via a torque tube. A carbon-fibre shaft rotates at engine speed in the torque tube. The advantages of this

sophisticated solution lie in the rigid link between the engine and transmission and, in turn, the optimum support for the forces and torque generated.

The AMG SPEEDSHIFT DCT 7-speed sports transmission boasts fast gear changes with virtually no loss of tractive force – in as little as 100 milliseconds. The driver has a choice of four different driving modes: "C" (Controlled Efficiency), "S" (Sport), "S+" (Sport plus) or "M" (Manual). In the Sport, Sport plus and Manual modes the automatic double-declutching function is active; all the modes can be selected conveniently via the rotary control in the AMG DRIVE UNIT. The RACE START function provides optimum traction – as does the mechanical differential lock, which is integrated into the compact transmission housing.

Sophisticated suspension layout with double-wishbone axles

The chosen solution with a front-mid-engine plus transaxle configuration ensures an ideal front/rear weight distribution of 47 to 53 percent. Mounting the engine behind the front axle has created the ideal conditions for consummate driving dynamics with precise steering, first-class agility, low inertia with spontaneous directional changes and outstanding traction. All four wheels are located on double wishbones with a track rod, a technology that has proven itself in motor racing right through to Formula 1. With a double-wishbone axle, the wheel location and suspension functions remain separate; the spring/damper struts are supported on the lower wishbone. The double-wishbone concept with its high camber and track rigidity positively locates the wheel with minimal elastic movements, providing the driver with an optimum sense of road contact when driving at the limits.

Wishbones, steering knuckles and hub carriers at the front and rear are made entirely from forged aluminium – substantially reducing the unsprung masses; this configuration also notably improves the suspension response. The long wheelbase of 2680 millimetres not only results in outstanding straight-line stability but also low wheel load shifts, significantly reducing the vehicle's tendency to dive and squat when braking and accelerating. The broad track width – front 1682, rear 1653 millimetres – ensures lower shifts in the wheel loads from the inner to the outer wheel when cornering, enabling the tyres to retain more grip.

Direct steering, differential lock and 3-stage ESP®

The rack-and-pinion steering gear provides a consistently direct steering feel with a constant mechanical ratio of 13.6:1, in tune with the high expectations placed on a super sports car. The power steering provides speed-sensitive assistance and improves feedback for the driver as the road speed increases: an indispensable factor for high-speed straight-line driving. Mounting the steering gear in front of the engine on the integral subframe enables the engine to be set down very low. The Gullwing model comes with 3-stage ESP® as standard, and the driver can choose the three "ESP ON", "ESP SPORT" and "ESP OFF" modes at the touch of a button. In "ESP OFF" mode too, operating the brake pedal restores all the normal ESP® functions.

Acceleration skid is controlled in all three ESP® modes. If one of the drive wheels starts to spin, specific brake pressure is applied to improve traction significantly – especially in conjunction with the standard-fit mechanical multi-disc limited-slip differential. This means that the engine power is transferred to the road even more effectively when driving in a particularly dynamic style.

AMG ceramic composite high-performance braking system available as an option

The AMG high-performance braking system with composite brake discs at the front ensures extremely short stopping distances even under high loads. The newly developed, optional ceramic composite brakes with even larger brake discs guarantee even better braking performance. The ceramic brake discs perform reliably at even higher operating temperatures thanks to their greater hardness, all combined with an impressive weight reduction of around 40 percent. Reducing the unsprung masses has further improved both comfort and grip, and the reduced rotating masses at the front axle ensure a more direct steering response.

Lightweight construction was also key when it came to the wheels: weight-optimised AMG light-alloy wheels – 9.5 x 19 inch (front) and 11.0 x 20 inch (rear) – based on the innovative flow-forming principle reduce the unsprung masses while improving driving dynamics and suspension comfort. In addition to the

standard-fit AMG 7-spoke light-alloy wheels, 5-twin-spoke wheels and weight-optimised 10-spoke forged wheels are available as an option. 265/35 R 19 (front) and 295/30 R 20 (rear) tyres developed exclusively for the SLS AMG ensure optimum performance. A tyre pressure monitoring system is fitted as standard to permanently monitor tyre pressure in all four wheels; individual tyres are shown on the display.

The SLS AMG as a masterpiece in AMG's more than 40-year history

The new SLS AMG is a true masterpiece on the part of Mercedes-AMG GmbH. As the first independently developed car, the super sports car is the highlight of the company's more than 40-year history. With this car AMG, the performance brand within Mercedes-Benz Cars, is not only entering a new era, but also demonstrating development expertise of the highest order.

AMG was established in 1967 by Hans Werner Aufrecht and Erhard Melcher, and is considered a pioneer in the field of vehicle tuning for motorsports. Following the cooperation agreement concluded in 1990 with Daimler-Benz AG, the company was gradually incorporated into what at the time was DaimlerChrysler AG in 1999. On 1 January 2005, DaimlerChrysler AG acquired 100 percent of the shares. Today Mercedes-AMG GmbH is a vehicle manufacturer in its own right, and AMG is the performance brand within Mercedes-Benz Cars. This subsidiary of Daimler AG specialises in unique, high-performance vehicles; its sporty saloons, SUVs, coupés, cabriolets, roadsters and specially built one-off models constitute a product portfolio which meets its customers' every wish. The product range encompasses a total of 16 AMG high-performance models with outputs ranging from 265 kW to 450 kW.

Mercedes-AMG has overall responsibility for developing the design, aerodynamics, interior as well as the powertrain, engine, suspension, brakes and electronics – right up to granting final approval for production of the complete AMG vehicle. The company is also in charge of all marketing and sales-related activities for its products.

At a glance: technical highlights* of the new Mercedes-Benz SLS AMG

Aluminium spaceframe: this design realised for the first time by Mercedes-Benz combines intelligent lightweight construction with great strength – thereby supporting the outstanding driving dynamics of the SLS AMG. The bodyshell weighs a mere 241 kilograms.	Standard
Adaptive front airbags: the front airbags can deploy in two stages, depending on the severity of the impact.	Standard
Aerodynamic balance: the SLS AMG combines optimum handling stability with a low drag coefficient and low wind noise.	Standard
AMG alubeam silver: this new process - a world first - makes the paint finish shine like liquid metal, with specific light reflections that give even more life to the painted surface. This effect is made possible by microscopic, 30 to 50-nanometer small pigment particles.	Optional
AMG DRIVE UNIT: integrated into this are the rotary control for the transmission modes, the engine starter button and keys for the ESP® functions, the AMG memory function and the extendable rear aerofoil.	Standard
Bi-xenon headlamps: gas-discharge lamps for low and main beam improve safety at night.	Standard
Carbon-fibre drive shaft: as in the Mercedes-Benz C-Class DTM racing touring cars, the drive shaft is of carbon-fibre. Although the shaft has to transfer 650 newton metres of torque from the engine to the double-declutch transmission, it weighs only 4.7 kilograms.	Standard
Differential lock: the mechanical multi-plate differential lock ensures improved traction in any road conditions.	Standard
Diffusor: integrated into the rear bumper, the diffusor directs the airflow from the underfloor upwards, acting together with the aerofoil to prevent unwanted uplift at the rear axle.	Standard

Double-declutch transmission: the AMG SPEEDSHIFT DCT 7-speed sports transmission has four driving modes including the RACE START function. Other attributes: fast gearshift response with virtually no interruption in tractive power, a tailor-made control strategy and increased gearshifting comfort.	Standard
Double wishbone suspension: with this technology familiar from motor racing, the wheel location and suspension functions are separate.	Standard
E-SELECT lever: its shape is reminiscent of a jet plane's thrust control. The driver is conveniently able to change between R, N and D by touch-control of the drive-by-wire system.	Standard
3-stage ESP®: the three modes "ESP ON", "ESP SPORT" and "ESP OFF" are available at the touch of a button.	Standard
Flow-formed light-alloy wheels: the manufacturing process allows lower wall thicknesses in the area of the rim base, while improving long-term rigidity. The weight saving versus conventional light-alloy wheels is around 1.1 kilograms per wheel.	Standard
Gullwing doors: with an opening angle of 70 degrees, the unique gullwing doors allow convenient access and egress.	Standard
Front-mid-engine: the AMG V8 engine installed behind the front axle provides the ideal conditions for perfect handling dynamics, with precise self-steering characteristics, first-class agility, low inertia during fast directional changes and outstanding traction.	Standard
Generator management: whenever the engine is on the overrun, kinetic energy is used to charge the battery rather than being uselessly converted to heat in the usual way. Conversely, the generator is switched to load-free mode when accelerating, which relieves the engine load. The result is a reduction in fuel consumption.	Standard
Smooth underbody: the almost completely panelled underbody reduces aerodynamic drag and helps to avoid uplift at the rear axle.	Standard

Rear aerofoil: attractively integrated into the boot lid, the aerofoil extends at 120 km/h and avoids unwanted uplift at the rear axle.	Standard
High-performance composite braking system: with this composite technology derived from motor racing, the grey cast iron discs are mounted on an aluminium bowl. This ensures perfect heat conduction and first-class fade resistance even in the gruelling conditions of the racetrack.	Standard
LED gearshift indicator: seven LEDs coloured white, yellow and red indicate the need for an upshift if the SLS AMG driver has selected the manual transmission mode and the engine speed is approaching its maximum.	Standard
High-performance ceramic composite braking system: by virtue of their greater hardness, the ceramic brake discs have even higher temperature resistance, and also contribute the benefits of 40 percent less weight.	Optional
Kneebag: in the event of a frontal impact, an additional airbag can help to protect the legs of the vehicle occupants.	Standard
Twin-wire arc spray coating (LDS): the advantages of this technology patented and exclusively used by AMG are extremely low friction and wear, as well as long-term durability of the cylinder walls.	Standard
Magnesium backrests: the backrests of the sports seats are of magnesium, a high-tech material that excels with low weight and high strength. This has considerable advantages in terms of the weight balance and a lower centre of gravity.	Standard
Matt paint finishes: with their matt silk surface, "*designo* magno allanite grey" and "AMG monza grey magno" reinforce the sporty character of the Gullwing model through specific contouring of the crease lines.	Optional
Performance suspension: with an approx. ten percent stiffer spring setup and 30 percent stiffer damper setup, the Performance suspension is recommended for the racetrack.	Optional

Forged pistons: the eight forged pistons of the AMG M159 engine weight a total of 0.5 kilograms less than the cast pistons of the basic M156 engine.	Standard
Forged wheels: forged AMG light-alloy wheels are 14 percent lighter than the Flow Forming wheels fitted as standard, thereby reducing the unsprung mases even further.	Optional
Tubular steel exhaust headers: with their precisely coordinated tube lengths, these improve the gas cycles for a considerable increase in output and torque. These exhaust headers are another technology borrowed from motor sports.	Standard
Superplastic forming: this enables multi-part components to be dispensed with during the production process for the outer door skin and interior. This not only saves weight, but also simplifies the production process.	Standard
Surround sound system: the Bang & Olufsen BeoSound AMG surround sound system with Dolby Digital 5.1 provides an exclusive listening experience at the highest level. The system has an amplifier with a total output of 1000 watts, 11 loudspeakers and a digital sound processor.	Standard
Transaxle arrangement: locating the double-declutch transmission at the rear axle allows a weight distribution of 47 percent (front) and 53 percent (rear) which benefits handling dynamics.	Standard
Dry sump lubrication: this technology derived from motor racing allows a lower installed position for the V8 engine. As a positive side-effect, the engine is reliably lubricated even under the high lateral acceleration encountered on the racetrack.	Standard
Topology optimisation: the cast components of the aluminium spaceframe are specifically weight-optimised: ribbed structures precisely follow the force paths, and wall thicknesses are reduced to a minimum in less highly stressed areas.	Standard

Torque tube: this forms a rigid connection between the engine and transmission, ensuring the best possible transfer of forces.	Standard
Ultra-high strength, hot-formed steel: this is used in the A-pillars to improve occupant safety even further.	Standard
Four-way lumbar supports: these provide the driver and passenger with effective lower back support.	Optional
Two-zone seat cushions: prominent side bolsters with a harder foam filling provide optimal lateral support, while the inner areas of the seat cushion and backrest are softer for a high level of comfort on long journeys.	Standard

*Selection

Breathtaking contours, visionary style

- **Purist design for passionate sportiness**
- **Gullwing doors as a unique highlight**
- **Powerful, muscular side aspect**
- **Exclusive "AMG alubeam silver" and two matt finishes**
- **Interior reminiscent of an aircraft cockpit**

The distinctive styling of the new Mercedes-Benz SLS AMG enthrals with its passionate sportiness and reinterprets the breathtaking lines of the Mercedes-Benz 300 SL – one of the outstanding design icons of the Mercedes-Benz brand. With its purist design the new SLS AMG reflects the philosophy of contemporary sports car engineering: the bonnet which measures just under two metres, the low greenhouse positioned well to the rear and the short rear end with an extendable aerofoil are just as powerful a reminder of the superlative dynamism as the long wheelbase, the wide track and the large wheels. The short overhangs feed through into the proportions, just as does the design of the super sports car with its low-slung front-mid-engine set well back and dual-clutch transmission in transaxle configuration. An undoubted styling highlight comes courtesy of the gullwing doors, which lend the SLS AMG its incomparable charisma – making a unique statement in this vehicle segment.

The gullwing doors are not alone in rekindling memories of the Mercedes-Benz 300 SL; the hallmark wide radiator grille with the large Mercedes star and the wing-shaped cross fins are a throwback to the front-end of the sports car legend. The three-dimensional, sculptured front-end with its low-set, swept-back front apron set well into the sides lends the SLS its powerful stance on the road. Six large cooling air intakes and the vertically arranged headlamps set well to the outside with their alluring inner ambience provide a dominant aura: the central bi-xenon low-beam headlamp with its metallic wing section is framed at the top by two LED indicators and by the LED daytime driving lights at the bottom.

Influences from aircraft engineering

Allusions to aircraft construction come courtesy of the prominent Mercedes star, whose tubular section is reminiscent of the air intake on a jet engine when viewed from the side, as well as the long bonnet: as the eye is drawn forward, so the observer becomes more aware of the curve. The design of the four fins with their Silver Shadow finish that adorn the two air outlet grilles on the end of the bonnet create the same visual impression. These aircraft-style lines also visually accelerate the air that flows past – and make the SLS AMG appear extremely dynamic even while stationary.

The fins on the bonnet are taken up on the vehicle flanks: the connoisseur also discovers here a hallmark styling feature of the 300 SL. The "6.3" lettering placed between the fins provides a clear reference to the high-displacement, naturally aspirated V8 engine. The side air outlet feeds through into a stylistically prominent feature line, which together with the convex flanks and the exhilarating surface treatment, combines aesthetics with power. The compact passenger compartment proves as alluring as it is unmistakable. With its high beltline, low side windows and steeply angled windscreen it comes across as a kind of visor. The forward-angled B-pillar with its stylish flowing sweep to the rear window exudes pure dynamism.

Side view dominated by muscle and shoulder

Viewing the SLS from the side, the eye is drawn to the prominent vehicle shoulder, which stretches from the front to the rear like a taut muscle. Distinctive 19-inch (front) and 20-inch (rear) light-alloy wheels fill the wheel arches, which stand out prominently from the sidewall. Three different wheel variants all provide a good view of the large high-performance composite brakes. Seen from above, a prominent, uninterrupted line runs from the muscle to the rear. This styling feature is also picked up on the bonnet where the eye follows a distinctive contour which flows over the roof between the gullwing doors, right through to the third brake light. On the right, a sporty filler cap of solid metal provides another visual highlight.

Rear view that emphasises width

The rear view of the SLS also exudes dynamism and power: the gently sloping boot lid emphasises a sense of width, an impression reinforced by the prominent vehicle shoulder and the sleek tail lights: fitted with LED technology, the horizontally structured lighting units provide a scintillating view. Wing-shaped LED lighting elements ensure a distinctive, enthralling night design. The Formula-1-style LED fog lamp/reversing light is set down low in the centre. Similarly inspired by motor racing are the black diffuser insert and the two chromed tailpipes of the sports exhaust system. The strikingly tapered rear apron provides an unimpeded view of the wide rear wheels, lending the SLS its self-assured stance on the road. The spoiler integrated in the boot lid is automatically deployed from a speed of 120 km/h to ensure optimum stability at high speeds. As the aerials for radio, navigation and telephone reception are invisibly integrated into the boot lid, they do not disrupt the car's silhouette.

New colours: "AMG alubeam silver" and two matt finishes

The colour charts for the SLS include nine exclusive paint finishes. The highlight comes in the shape of the unique "AMG alubeam silver" paintwork: the new, unique process makes the paint shine like liquid metal. The paint covers the body panels like a metallic skin, emphasises the scintillating design lines of the SLS more strongly than any previous paint job and makes them even livelier by means of targeted light reflections. This effect is made possible by tiny pigment particles measuring between 30 and 50 nanometres.

The two matt finishes "*designo* magno allanite grey" and "AMG monza magno grey" are just as eye-catching: with their matt-silk surface they reinforce the sporty character of the two-seater through specific contouring of the crease lines.

Interior with allusions to aircraft engineering and motor sports practicality

You only need to open the gullwing doors on the Mercedes-Benz SLS AMG and ease into the sports seats to experience a whole new level of interior. The Mercedes-Benz designers took their inspiration from aircraft engineering when

styling the interior – immediately bringing an aircraft cockpit to mind. The characteristic styling feature is the dashboard, whose powerful and dramatic wing shape makes for an impression of width. Strikingly integrated into the dashboard are the galvanised air vents with their adjustable, cruciform nozzles and Silver Shadow finish – their shape reminiscent of a jet's engines. The instrument cluster with its LED upshift indicator and two white backlit dial instruments add another decidedly sporty touch with their metallic Silver Shadow finish. The silver dials have red needles and a 360 km/h speedometer scale. As a central feature of the cockpit, the COMAND APS multimedia system with its 7-inch screen is integrated between the two centre air vents.

The elongated centre console in carbon fibre similarly picks up the design theme of an aircraft cockpit. It is home to the AMG DRIVE UNIT, which is inclined towards the SLS driver and allows him to choose his personal vehicle setup. The E-SELECT shift lever, whose styling recalls the thrust control of a jet, controls the AMG SPEEDSHIFT DCT 7-speed sports transmission. All the controls are made from solid metal, with a high-sheen Silver Shadow surface. On request other interior features such as the door sill panels, the trim on the interior door panels and the seat back trim are available in carbon-fibre.

Authentic cockpit atmosphere in the interior of the SLS AMG

The concave interior panels of the gullwing doors and the high beltline provide an authentic cockpit atmosphere. Together with the roof-integrated gullwing doors, the high sideskirts and the wide centre tunnel extending well to the rear, they reinforce the feeling of safety and security. Decorative and contrasting stitching, as well as fine *designo* leather on the sports seats, create a luxurious visual impression and accentuate the "hand-built" look. All surfaces such as the interior door panels and armrests are softly padded for a pleasant feel. All keys and switches are surfaced with Softtouch paint for a silky sheen and soft contact surface. The homogeneous, amber-coloured illumination of the switch symbols ensures clear recognition and enhances the high-quality appearance of the interior when driving at night.

Dynamic steering wheel design and leather in five different colours

An authentic racing car touch is provided by the AMG Performance steering wheel, which has a diameter of only 365 millimetres. The rim has a flattened lower section and an oval cross-section, plus perforated leather in the ergonomically formed grip area, for outstanding vehicle control. The shift paddles and lower insert are of metal. The unmistakable attention to detail for which Mercedes designers are known is very evident in the tasteful colour combinations of the SLS AMG interior. Five different designo leather colours are available to meet individual preferences: black, classic red, sand, porcelain and light brown. The sports seats with integrated head restraints and sporty transverse fluting are upholstered in designo leather – and two-tone *designo* leather seats are also available in classic red, sand and porcelain. If light brown is chosen as an interior colour, the sports seats are upholstered in natural leather with particularly high-quality woven leather on the centre seat panels. Depending on the colour combination, fluorescent or black piping provides another sporty touch.

The A-pillars, roof lining and parcel shelf are lined in anthracite Alcantara, heightening the functional motor sports atmosphere. These surfaces are complemented with the sporty carpeting and floor mats bearing the AMG logo.

Exclusive, high-performance eight-cylinder front-mid-engine and double-declutch transmission in a transaxle arrangement

- **Output of 420 kW and 650 newton metres of torque**
- **Exhilarating responsiveness and emotional engine sound**
- **Dry sump lubrication to keep the centre of gravity low**
- **Seven-speed double-declutch transmission at the rear axle**
- **A torque tube connects the AMG V8 engine to the transmission**
- **Fuel consumption 13.2 litres per 100 km**

Eight cylinders and a displacement of 6.3 litres in a front-mid-engine arrangement, a high-revving concept, dry sump lubrication and a performance-oriented intake and exhaust system: opening the almost two-metre long bonnet of the SLS AMG affords a view of an outstanding high-performance engine spefically developed by AMG for the new Gullwing model. With a peak output of 420 kW at 6800 rpm and 650 newton metres of torque at 4750 rpm, the AMG 6.3-litre V8 unit sets new standards and is also the world's most powerful naturally aspirated series production engine. The SLS accelerates from zero to 100 km/h in 3.8 seconds, and has a top speed of 317 km/h (electronically limited). The DIN kerb weight of 1620 kilograms produces an extremely favourable power-to-weight ratio of only 3.86 kilograms per kW.

The use of specific fuel economy measures has enabled a fuel consumption of 13.3 litres per 100 kilometres (combined) to be achieved. Power transfer in the SLS AMG is by a new, seven-speed AMG double-declutch transmission located at the rear axle in a transaxle arrangement. It is rigidly connected to the engine by a torque tube.

Based on the M156, which develops 386 kW and 630 newton metres in e.g. the E 63 AMG, the new, naturally aspirated eight-cylinder engine is a comprehensive further development specifically for the SLS AMG. The most important modifications affect the intake and exhaust systems, the oil supply and the crankshaft drive. A total of more than 120 parts and components were redesigned on the ba-

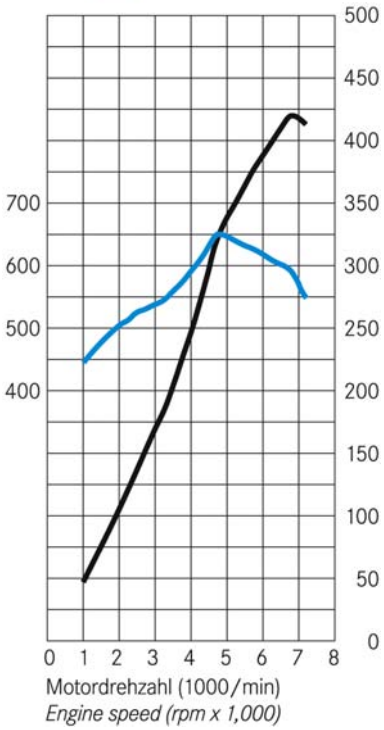
sis of major findings obtained from more than 40 years of motor racing experience.

In design terms the M159 is a completely autonomous AMG development, as was the M156. This unique combination of a fast-running concept and a large displacement achieves the best of both worlds: exhilarating flexibility accompanied by high torque at low engine speeds. The new AMG V8 already delivers 545 newton metres to the crankshaft at 2500 rpm, with the maximum of 650 newton metres on tap from 4750 rpm – more than any other naturally aspirated engine in this output and displacement class. In short, the new AMG eight-cylinder guarantees dynamic acceleration, rapid intermediate sprints and sheer driving pleasure at the highest level, or relaxed, day-to-day cruising when preferred.

Key data at a glance:

	Mercedes-Benz SLS AMG
Cylinder arrangement	V8
Cylinder angle	90°
Valves per cylinder	4
Displacement	6208 cc
Bore x stroke	102.2 x 94.6 mm
Cylinder spacing	109 mm
Compression ratio	11.3 : 1
Output	420 kW at 6800 rpm
Output per litre	67.6 kW
Max. torque	650 Nm at 4750 rpm
Torque per litre	104.7 Nm
Maximum engine speed	7200 rpm

Mercedes-Benz SLS AMG
Leistungsdiagramm
Power Output Graph



Mean pressure	13.16 bar
Engine weight (dry)	206 kg
Power/weight ratio	0.49 kg/kW
Fuel consumption NEDC combined	13.3 l/100 km
CO_2 emissions	311 g/km
Acceleration 0-100 km/h	3.8 s
Top speed	317 km/h*

* electronically limited

Optimum cylinder charging thanks to newly designed intake air ducting

One key aspect of the increase in output and torque is the optimised cylinder charging. The new, more flow-efficient design of the intake air ducting leads to a reduction in pressure losses, while the completely revised valve drive improves the gas dynamics. The newly developed magnesium intake manifold features precisely coordinated resonance tube lengths. Eight velocity stacks with a length of 290 millimetres and a diameter of 51.5 millimetres supply the combustion chambers with fresh air. Behind the new air filters with a volume of just under 9500 cubic centimetres there are two throttle flaps with a diameter of 74 millimetres. Their electronic adjustment is practically instantaneous: it takes only 150 milliseconds to open the two throttle flaps to their maximum. The result is exhilarating responsiveness. Two hot-film air mass sensors located behind the air filters supply the engine electronics with the necessary temperature and density data for the intake air.

Intake system: optimised cylinder charge through precisely matched resonance tube lengths

One special characteristic of the V8 engine is its sophisticated valve drive, which borrows features from the powerful AMG racing engines. The 32 valves in the cylinder heads are operated by bucket tappets. Their space-saving design allows a stiff valve train and therefore high engine speeds with large valve opening cross-sections, which in turn benefits output and torque. The large intake valves have a diameter of 40 millimetres, while their opposite numbers on the exhaust side measure 34 millimetres. In contrast to a racing engine, the valve drive is maintenance-free with hydraulic valve clearance compensation.

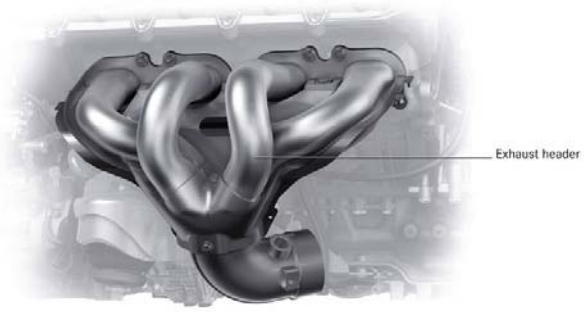
Four continuously variable overhead camshafts

All four overhead camshafts are continuously variable over a range of 42 degrees. Both the intake and exhaust camshafts are adjusted as a function of engine load and engine speed, ensuring extremely high output and torque values as well as smooth idling and especially low exhaust emissions. Depending on the engine speed, the valve overlap can be varied to ensure an optimal supply of fuel/air mixture to the combustion chambers and efficient venting of the exhaust gases. The variable camshaft adjustment is controlled electrohydraulically, and monitored by the engine control unit.

Distinctive exhaust note with two exhaust headers

Optimised performance and an emotional sound signature: these were the requirements when developing the sports exhaust system. Exhaust headers with precisely coordinated tube lengths – a further technology transfer from motor racing – ensure a significant increase in output and torque by improving the gas cycle. The large pipe cross-sections of the newly developed twin exhaust system effectively reduce the exhaust counterpressure. Two relatively small pre-silencers on the underbody and a large, transversely installed main silencer at the rear help to ensure optimum weight distribution.

Exhaust header: technology from motor racing



The AMG specialists attached particular importance to the sound signature of the large-displacement eight-cylinder power unit, and exhaustive tests were carried out to achieve a synthesis of immediately perceptible dynamism and the long-distance qualities typical of a Mercedes. Great attention was also paid to the elimination of irritating noises, while accentuating the frequencies perceived as pleasant and typical of a sports car. At the same time it was of course necessary to comply with the legal requirements – for example when measuring passing noise. The two exhaust tailpipes integrated into the rear apron emit a characteristic eight-cylinder sound that leaves the real car-lover in no doubt: here comes a true AMG.

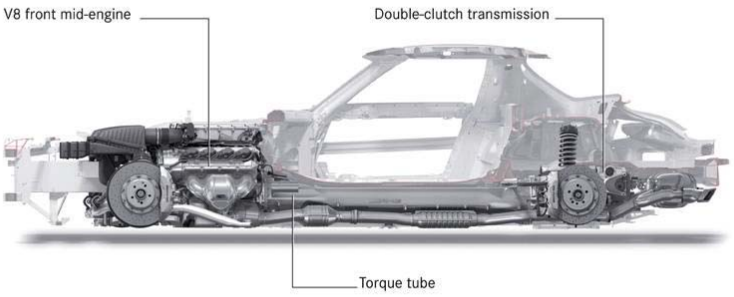
Two ceramic catalytic converters optimised for counterpressure and located at the firewall directly by the exhaust header, plus two metal catalytic converters on the underbody, provide effective exhaust gas aftertreatment and ensure compliance with current and future limits such as EU 5, LEV 2 and ULEV. The new AMG

engine also easily meets specific requirements for the US market, such as Onboard Diagnosis II and lambda sensor diagnosis.

Dry sump lubrication to lower the centre of gravity

One major criterion when formulating the technical concept for the SLS AMG was the installed position of the engine. The requirement was for the engine to be positioned low down and well to the rear, so as to lower the car's centre of gravity significantly and achieve a balanced weight distribution between the front and rear axles. The solution found, namely to install the eight-cylinder power unit as a front-mid-engine behind the front axle, combining it with a transmission in a transaxle layout, led to a weight distribution of 47 percent at the front and 53 percent at the rear which is typical of a sports car.

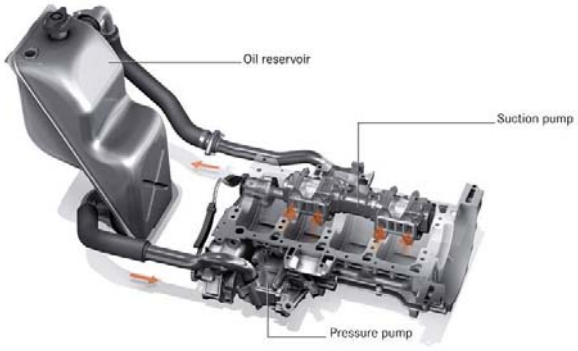
Transaxle plus dry sump lubrication:
Low centre of gravity and ideal weight distribution for perfect driving dynamics



The low installed position of the V8 engine is the result of a changeover to dry sump lubrication – which eliminates the usual oil sump. The dry sump lubrication system of the M159 consists of a suction pump, a pressure pump and an external 5-litre oil tank located in front of the engine. All in all, 13.5 litres of engine oil circulate around the complete system. The oil scavenging pump sucks the oil directly from the crankcase and cylinder heads, delivering it to the external oil tank at a maximum rate of 700 litres per minute. The efficient oil scavenging further improves the efficiency of an already very efficient engine.

The reciprocating pressure pump conveys the oil from the external oil tank back to the engine, ensuring effective lubrication even under the high lateral acceleration forces that usually occur on racetracks. The demand-related control of the oil pressure pump is based on the engine speeds programmed into the control unit, as well as the characteristic maps for temperature and engine load. This leads to a reduction in the engine's power dissipation, and a considerable reduction in fuel consumption. Two large coolers in the front wheel arches, each with a blower fan integrated on one side, ensure that the engine oil is efficiently cooled.

Dry sump lubrication with external oil reservoir



Another innovation used in the engine of the SLS AMG for the first time is the so-called "gas-spring principle", where the air compressed beneath the piston as it moves down the gas-tight crank chamber is prevented from escaping. On the upstroke the rebound energy is almost completely returned to the pistons. This principle prevents flow losses. Another positive effect is the much greater rigidity of the crankcase. The gas-spring principle has enabled fuel consumption to be reduced by 1.5 percent – while increasing output by 7 kW.

Outstanding strength and optimised lightweight construction also for the engine

As another new development, the eight forged pistons are a total of 0.5 kilograms lighter than cast pistons. The reduction in oscillating masses improves both responsiveness and flexibility. Optimum cooling of the severely stressed piston

crowns is by means of pressure-controlled oil-spray nozzles in the crankcase. As another specific weight-saving measure, there are no steel liners locating the main crankshaft bearings. The crankcase of the M159 is wholly of aluminium, and around 4 kilograms lighter than its counterpart in the M156. To reduce weight even further, aluminium bolts are mainly used in the M159. This saves another 0.6 kilograms or so compared to steel bolts. The weight of the V8 engine in the SLS is 206 kg, producing a first-class power-to-weight ratio of 0.49 kg/kW.

As is usual in motor sports, the crankcase is a rigid bedplate design of closed-deck construction. The engine block and cylinder heads are of cast aluminium-silicon alloys (AlSi7 and AlSi17) which represent the state of the art in terms of weight, thermal and mechanical resistance and long-term strength. As in the M156, the engine specialists at Mercedes-AMG use a particularly advanced process for the eight cylinder walls to produce a tribologically optimal surface, namely a coating applied by twin wire arc spraying (TWAS). The advantages of this technology patented by AMG are extremely low friction and wear accompanied by outstanding long-term durability. A considerably harder surface is achieved compared to conventionally coated cylinder walls. In fact the cylinder walls of the new AMG V8-engine are twice as hard as conventional cast iron liners – a quantum leap for engine specialists.

Other high-tech components and systems adopted from the M156 include:

- the finely balanced crankshaft of forged steel;
- water-cooling of the cylinder head using the thermally very efficient crossflow principle familiar from the motor racing world;
- variable coolant control for optimised efficiency;
- computer-controlled fuel delivery, with the fuel integrated into the fuel tank.

Newly developed cooler module of weight-optimised design

The coolant is cooled by a large cooler module located behind the radiator grille. The condenser for the air conditioning and the cooler for the steering servo fluid are also integrated into this module. As a particular bonus, this completely new

development has reduced the weight by around 4 kilograms compared to the previous components – while improving efficiency at the same time. A large suction fan located directly behind the radiator conducts the hot air away as required.

Efficient control unit for generator management

The Bosch ME 9.7 AMG control unit also has a generator management function as a further system that helps to save fuel. Sensors monitor the charge status of the vehicle battery, and reduce the output of the generator if the battery has sufficient charge. The system uses the overrun phases of the engine to recharge the battery, kinetic energy being converted into electrical energy by recuperation.

Careful combination of efficiency-enhancing measures has enabled a combined fuel consumption of 13.3 litres per 100 km (premium petrol) to be achieved. This is an outstanding figure, as the new SLS AMG is after all one of the most powerful cars in the super sports car segment.

Engine production at the Affalterbach plant

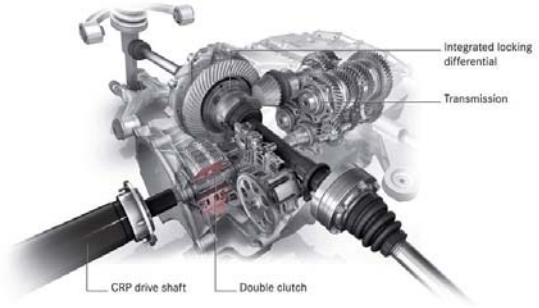
The new V8 powerpack for the SLS is produced in the ultra-modern AMG engine shop, on the "one man, one engine" principle. This means that a single technician assembles the engine by hand from start to finish – as witness the high-quality AMG engine plate bearing the signature of the technician responsible. The design of the AMG eight-cylinder is also a feast for the eyes, starting with the new, titanium grey cover of the magnesium intake manifold with its two prominent AMG logos, and the optional carbon-fibre engine compartment cover that frames the high-performance power unit so attractively.

AMG seven-speed double-declutch transmission with RACE START

The ideal partner for the powerful, naturally aspirated eight-cylinder engine is the AMG SPEEDSHIFT DCT 7-speed sports transmission – a newly developed double-declutch transmission with seven gears, four driving modes and a RACE START function. The advantages of this technology, which is once again derived from motor racing, include highly responsive gearchanges without any interruption in tractive

power, a tailor-made control strategy and improved gearshifting comfort. Specifically configured for the high-revving nature of the AMG 6.3-litre V8 engine, the AMG SPEEDSHIFT DCT 7-speed sports transmission provides optimum ratios with only small rpm changes. In short, the new transmission gives the driver even more dynamic acceleration for maximum driving pleasure.

Compact: AMG double-clutch transmission with integrated locking differential



AMG DRIVE UNIT with four driving modes for maximum pleasure

The central control point for the AMG SPEEDSHIFT DCT 7-speed sports transmission and all dynamic control functions is the AMG DRIVE UNIT. The rotary electronic control for selection of the four driving modes and activation of the RACE START function is located to the left of the E-SELECT shift lever.

The double-declutch transmission allows upshifts under full load both in automated and manual mode, where the gears can be shifted using the AMG shift paddles on the steering wheel. There is a choice of four driving modes for maximum driving pleasure and comfort: "C" (Controlled Efficiency), "S" (Sport), "S+" (Sport plus) and "M" (Manual). In Controlled Efficiency mode the high torque already available at low engine speeds is used to shift up to the highest viable gear. The resulting dethrottling effect on the intake side lowers fuel consumption, with accompanying benefits in terms of engine noise. Controlled Efficiency also means comfortable gearchanges and "soft" accelerator characteristics for relaxed cruising.

In "S" mode the transmission remains in each gear to a higher speed, downshifts are faster and gearshifts are performed around 20 percent more rapidly than in "C" mode. Switching to "S+" mode shortens gearshift times by a further 20 percent, while "M" is the most sporty mode of all: the AMG 6.3-litre V8 engine now responds with even more "bite", and the AMG double-declutch transmission changes the gears another 10 percent faster – a total reduction of 50 percent compared to "C" mode. In "M" mode the transmission performs gearchanges in less than 100 milliseconds. The upshift indicator integrated into the AMG instrument cluster informs the driver when a manual gearchange is advisable: seven LEDs coloured white, yellow and red indicate the necessary action. The faster the engine speed approaches the maximum of 7200 rpm, the more LEDs light up.

Best possible traction thanks to the RACE START function

The RACE START function delivers maximum dynamism: in order to use it, the driver has to activate the ESP® Sport function while the vehicle is at a standstill, and press the brake pedal with his left foot. Having preselected the RACE START program using the rotary switch, the driver is presented with a confirmation message in the AMG central display. After confirming the RACE START function by pulling the "Up" shift paddle once, all he has to do is depress the accelerator fully and take his foot off the brake. The optimum start-up engine speed is set fully automatically, and the SLS AMG accelerates away with flawless traction – all the way up to top speed if required. The driver does not need to shift the gears manually, as the DCT transmission performs lightning-fast gearchanges.

Automatic double-declutching function for even more emotional appeal

In the "S" (Sport), "S+" (Sport plus) and "M" (Manual) modes, the automatic double-declutching function is active. Every manual or automatic downshift is accompanied by precisely metered double-declutching – incrementally from "S" through "S+" to "M". This not only adds to the driver's emotional experience: the load-free downshift minimises load-change reactions, which pays dividends – particularly when braking into a bend on the racetrack – and also enhances safety in the wet or on ice.

The new AMG double-declutch transmission excels with compact dimensions and a low weight of only 136 kilograms, including the differential. Aluminium construction and the absence of a conventional torque converter improve efficiency and make a significant reduction in fuel consumption possible. A mechanical, multi-plate differential lock configured for sporty performance at the physical limits is also integrated into the transmission housing.

Torque tube with carbon-fibre drive shaft between the engine and transmission

The torque tube turns the AMG SPEEDSHIFT DCT 7-speed sports transmission and the V8 engine into a fixed unit. The engine and the transmission installed in a transaxle arrangement at the rear axle are firmly connected with very low flexural and torsional flexibility, and support each other. This has decisive advantages in terms of handling dynamics and driving comfort, as this sophisticated solution makes it possible to eliminate much more free play from the entire powertrain. The 1.64-metre long torque tube consists of a one-piece sand-cast aluminium housing, and weighs less than 25 kilograms. A drive shaft rotates at engine speed inside the housing. As in the Mercedes-Benz C-Class DTM racing touring cars, the shaft is made from carbon-fibre. One of the key advantages of this high-tech material is that despite its high strength, the shaft tips the scales at only 4.7 kilograms. This means that the 1.71-metre long drive shaft, which is required to transfer no less than 650 newton metres of torque from the engine to the double-declutch transmission, is around 30 percent lighter than a steel version would be.

Intelligent solution: the torque tube with an integrated CRP drive shaft links engine and transmission

A specially developed torsional damper is also active within the torque tube. This reliably eliminates resonances and vibrations, thereby optimising ride and noise comfort.

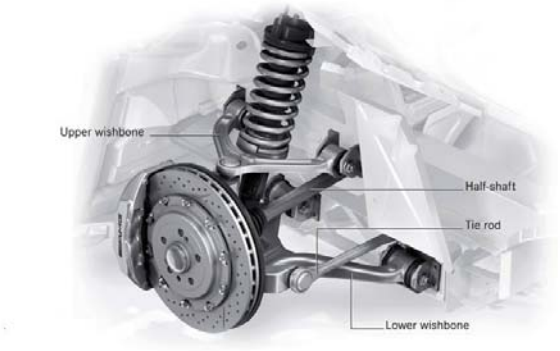
High-tech from motor racing for perfect racetrack performance

- **Aluminium suspension with double-wishbone axles**
- **Performance suspension with a stiffer setup on request**
- **"Flow Forming" AMG light-alloy wheels of 19 and 20-inch size**
- **3-stage ESP® and mechanical multi-plate differential lock**
- **New ceramic composite high-performance braking system available as an option**

The motor sports derived technology to be found everywhere in the powertrain of the Mercedes-Benz SLS AMG is also evident in the suspension and braking system. The aluminium suspension with double-wishbone axles is designed for uncompromising lightweight construction and outstanding handling dynamics. On request the AMG high-performance braking system is also available in a newly developed, highly stress-resistant ceramic version, with composite brake discs all-round.

The commitment of Mercedes-Benz and AMG to building a highly desirable super sports car that combines consummate racetrack performance with hallmark Mercedes long-distance comfort has given rise to an ingenious suspension layout. All four wheels are located on double wishbones with a track rod, a technology that has proven itself in motor racing right through to Formula 1. With a double-wishbone axle, the wheel location and suspension functions remain separate; the spring/damper struts are supported on the lower wishbone. The double-wishbone concept with its high camber and track rigidity positively locates the wheel with minimal elastic movements, providing the driver with an optimum sense of road contact when driving at the limits.

From the world of motor racing: double-wishbone suspension for perfect driving dynamics



The kinematics are determined by the differing lengths of the control arms and the position of the control arm anchorage points on the chassis and hub carriers. The broad base of the controls transfers the wheel forces to the rigid steel subframe at the front axle, and into the compact and rigid, cast nodal points of the rear-end structure. The wishbones, steering knuckles and hub carriers at the front and rear are made entirely from forged aluminium – substantially reducing the unsprung masses; this configuration also notably improves the suspension response.

The suspension setup of the SLS AMG ensures optimum, low body roll and a stiff basic configuration with good suspension comfort. A Performance suspension is also available on request: compared to the standard suspension, the spring rate and damping are respectively around 10 percent and 30 percent stiffer. The Performance suspension is conducive to even more agility and lateral dynamics, as well as a further reduction in body roll when driving at high speeds – for example on the racetrack.

Long wheelbase and wide track

The long wheelbase of 2680 millimetres not only results in outstanding straight-line stability but also low wheel load shifts, significantly reducing the vehicle's tendency to dive and squat when braking and accelerating. The broad track width – front 1682, rear 1653 millimetres – ensures lower shifts in the wheel loads from the inner to the outer wheel when cornering, enabling the tyres to retain more

grip. The large caster angle of 11.6 degrees significantly increases negative wheel camber on the outer wheel when cornering, and also improves tyre grip – this also ensures outstanding stability when braking heavily while cornering.

Weight-optimised "Flow Forming" AMG light-alloy wheels

The weight-optimised axle design is complemented with AMG light-alloy wheels produced by the new "flow forming" process. During this production process, hot forming in the area of the rim base makes for a denser material structure, thereby improving long-term durability. This also means that lower wall thicknesses can be used. The weight saving of around 1.1 kilograms per wheel compared to conventional light-alloy wheels reduces the unsprung masses, further improving the handling dynamics and suspension comfort.

The AMG light-alloy wheels in size 9.5 x 19 inches at the front and 11.0 x 20 inches at the rear are shod with 265/35 R 19 size tyres at the front and 295/30 R 20 at the rear. Three variants are available: AMG light-alloy wheels in a 7-spoke design or a 5-twin-spoke design, or alternatively low-weight forged wheels in a 10-spoke design. With an approx. 14-percent lower weight than the "Flow Forming" wheels, these reduce the unsprung masses even further. The weight saving per wheel is 1.8 kilograms. Tyres developed exclusively for the SLS AMG ensure top performance and excellent grip.

A tyre pressure control system which continuously monitors the pressure in all four tyres is standard equipment, with the data for each wheel shown in the display. During a journey, four wheel sensors on the insides of the light-alloy wheels send out continuous radio signals with information about the air pressure, tyre temperature and direction of rotation. A control unit evaluates the data and informs the driver in the event of a deviation from the nominal values. In this case the display shows the message "Check tyres!", or in case of a sudden pressure loss "Attention. Tyre defect!". A yellow warning lamp also lights up in the instrument cluster.

Power-assisted rack-and-pinion steering for direct feedback

With a constant mechanical steering ratio of 13.6:1, the rack-and-pinion steering of the SLS AMG provides direct feedback and meets the high expectations for a super sports car. The servo assistance is speed-sensitive, improving the feedback to the driver as the speed increases – an indispensable factor when driving straight ahead at high speed. Perfect linear transfer of the steering angles is made possible by the constant velocity joint integrated into the steering system. The chosen geometry also provides plenty of scope for the performance-enhancing headers in the sports exhaust system.

Installing the steering gear on the subframe in front of the engine allows a particularly low engine position. The subframe is of high-strength steel, and is rigidly bolted to the side members. It not only optimises steering precision, but is also a key component in the front-end crash structure.

AMG high-performance braking system with composite technology

High deceleration performance, precise pedal feedback, perfect fade-resistance and superior safety reserves are the key attributes of the AMG high-performance braking system. Ventilated, grooved and perforated brake discs all-round in size 390 x 36 millimetres at the front and 360 x 26 millimetres at the rear ensure excellent deceleration performance. Brake discs in race-tested composite technology are installed at the front axle, with the grey cast iron discs radially and axially

floating, and fixed to an aluminium bowl via stainless steel connections. This sophisticated technology ensures highly efficient heat conduction, and therefore outstanding fade-resistance even with a highly dynamic style of driving.

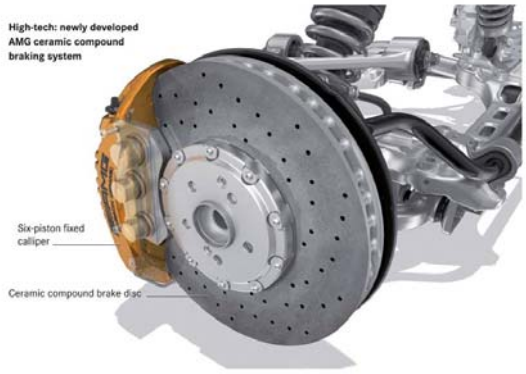
The use of aluminium also saves weight, and in the case of the brakes this has particular advantages in terms of agility and suspension responsiveness because of the considerable reduction in unsprung masses. Six-piston fixed callipers at the front and four-piston fixed callipers at the rear allow a generous brake lining surface area of 2 x 120 sq. cm and 2 x 58 sq. cm. The AMG high-performance braking system achieves a braking output of 816 kW during emergency braking from 250 km/h to standstill.

High-performance ceramic composite braking system as an option

A high-performance ceramic composite braking system is available as an option. This is instantly recognisable by the specially painted brake callipers with "AMG Carbon Ceramic" lettering. Thanks to the special materials and production technology used to manufacture the discs from carbon-fibre reinforced ceramics in a vacuum at 1700 degrees Celsius, the ceramic discs are much harder. This not only increases the service life many times over compared with a grey cast iron disc, but also the resistance to extreme loads and heat. The result is extremely short stopping distances, an exact pressure point and much higher fade resistance even under extreme operating conditions. The larger ceramic discs – front: 402 x 39 millimetres; rear: 360 x 32 millimetres – are of composite construction and are connected to an aluminium bowl by a floating radial mounting. At 823 kW during emergency braking from 250 km/h, their braking performance is even higher than that of the AMG composite braking system.

The ceramic brake discs are 40 percent lighter in weight than the conventional, gray cast iron brake discs. The further reduction in unsprung masses not only improves handling dynamics and agility, but also ride comfort and tyre grip. The lower rotating masses at the front axle also ensure a more direct steering response – which is particularly noticeable when taking motorway bends at high speed. The ceramic discs are also corrosion-proof, and therefore unaffected by deicing salt and brine. Six-piston fixed callipers with a brake lining area of 2 x

154 sq. cm. are installed at the front, with four-piston fixed callipers and a lining area of 2 x 73 sq. cm. at the rear.



Braking system data for the Mercedes-Benz SLS AMG at a glance:

	Composite braking system	**Composite ceramic braking system**
Front axle:		
Brake disc	Aluminium/grey cast-iron, composite technology, ventilated, perforated, grooved	Aluminium/ceramic, composite technology, ventilated, perforated
Diameter	390 mm	402 mm
Thickness	36 mm	39 mm
Weight*	13.5 kg	7.9 kg
Brake calliper	6-piston aluminium fixed callipers	6-piston aluminium fixed callipers
Lining area	2 x 120 sq. cm	2 x 154 sq. cm
Rear axle:		
Brake disc	Grey cast-iron, one-piece, ventilated, perforated, grooved	Aluminium/ceramic, composite technology, ventilated, perforated
Diameter	360 mm	360 mm
Thickness	26 mm	32 mm
Weight*	10.6 kg	6.5 kg
Brake calliper	4-piston fixed callipers	4-piston fixed callipers
Lining area	2 x 58 sq. cm	2 x 73 sq. cm

* weight of the brake disc

Both AMG high-performance braking systems feature precisely configured cooling ducts: the airflow entering the apertures in the front apron is conducted directly to the front brake callipers, helping to lower peak temperatures in the brake fluid – for example when driving at very high speeds on a racetrack.

Efficient anti-locking system and 3-stage ESP®

The specification of the braking system includes an anti-locking system with demand-controlled brake distribution. When braking on bends, a yawing moment is produced which counteracts and stabilises the vehicle's tendency to turn on its own axis. The braking system uses the data supplied by the ESP® sensors in order to identify such situations reliably.

The Electronic Stability Program is designed as a sophisticated 3-stage ESP® with a sports function – a speciality exclusive to AMG. Perfectly configured to match the outstanding driving dynamics of the SLS, 3-stage ESP® has three different settings. Using the ESP® key in the AMG DRIVE UNIT, the driver is able to choose between "ESP ON", "ESP SPORT" and "ESP OFF" – the currently active mode is shown in the display of the AMG instrument cluster. In "ESP ON" mode, there is braking intervention at one or more wheels and a reduction in engine torque if the car starts to become unstable.

Briefly pressing the ESP® key activates "ESP SPORT". By means of over/understeer intervention accompanied by engine torque adjustment, this mode allows even more dynamic handling manoeuvres such as the appropriate drift angles. All the functions of ESP® are available as soon as the brake pedal is depressed.

Sustained pressure on the ESP® key activates "ESP OFF". In terms of driving dynamics, the engine torque is also no longer reduced in this case. "ESP OFF" should only be used by highly experienced drivers on closed racetracks. In this mode too, all the functions of ESP® are available as soon as the brake pedal is depressed. Acceleration skid is controlled in all three ESP® modes. As soon as a drive wheel begins to spin, traction is significantly improved by specific braking

intervention and interaction with the standard, mechanical multi-plate differential lock. This enable the engine power to be transferred to the road even more efficiently when driving in particularly dynamic style.

Hill-holder function improves comfort and safety

Numerous functions of the high-performance braking system also improve comfort and safety, for example the hill-holder function. When the sensor system detects that the driver wishes to move off on a gradient, the hill holder function is activated automatically and maintains a constant brake pressure for a short time to prevent the car from rolling backwards. This gives the driver enough time to move his foot from the brake to the accelerator without first engaging the parking brake.

If the driver suddenly takes his foot off the accelerator pedal prior to emergency braking, the braking system increases the pressure in the brake lines and applies the pads to the brake discs, so that they can grip instantly with full force when the brake pedal is pressed. The system supports the standard Brake Assist by means of this 'priming'. Further standard features include the brake-drying function, which uses brief braking impulses to ensure that the film of water on the brake discs is removed in the wet, thus considerably improving the responsiveness of the brakes.

Lightweight construction for maximum driving dynamics and sports car functionality

- **Aluminium spaceframe weighs only 241 kilograms**
- **Low centre of gravity and transverse reinforcing struts for superb dynamism**
- **Efficient aerodynamics for optimum handling stability**
- **High standard of safety and the quality typical of a Mercedes**
- **The very latest restraint systems, with up to eight airbags**

Lightweight construction, stability and driving dynamics accompanied by typical Mercedes safety – these four factors were major focal areas in the specifications for the Mercedes-Benz SLS AMG. As the completely newly developed super sports car was based on no other Mercedes model series, its developers had more freedom than usual in the design and construction of the body. The aluminium spaceframe weighing just 241 kilograms is a major component in the overall concept. For the first time not only the outer skin, but also the complete bodyshell structure is entirely of aluminium, leading to a low kerb weight of 1620 kilograms. A new milestone for Mercedes-Benz and AMG.

In the new Gullwing model, the use of aluminium is more consistent than ever before. Maximum linear and lateral dynamics with first-class steering precision are only achievable with a very light but at the same time extremely rigid structure – which is where aluminium is the ideal material. It is not only *high* static and dynamic flexural and torsional rigidity that plays an important part here, but also the transfer and dissipation of extreme linear and transverse forces from the powertrain and suspension.

Combination of cast aluminium components and sections

The aluminium spaceframe of the SLS consists of cast aluminium components and aluminium sections. Cast components are used at the nodal points where forces come together or where functions are highly integrated, i.e. where large

forces must be transferred or where large components such as the doors or dashboard are attached. Cast components have the advantage of specific redirection of forces, and make it possible to vary wall thicknesses locally according to the loads encountered. Areas of greater rigidity can therefore be incorporated where required, for example at the chassis connections. Moreover, only the necessary wall thickness is provided at any point of the structure, which saves weight in the areas subject to lower forces.

The cast components have been made weight-efficient with the help of so-called topology optimisation: ribbed structures precisely follow the directions of the forces encountered, while wall thicknesses are reduced in areas where the loads are lower. The roof side member is one example: this highly stressed but weight-optimised component carries the structural loads between the front and rear of the roof frame, and also bears the hinges for the gullwing doors. Especially in this component, topology optimisation also helps to lower the vehicle's centre of gravity.

Roof longitudinal member: weight-optimised cast aluminium component subjected to high stress

Torsionally rigid structure with an intelligent material mix

Lightweight aluminium sections connect the nodal points to a sturdy structure. The large, low-set cross-sections of these aluminium sections ensure high resistance torque, thus providing the required direct transfer of drive, braking and suspension forces. The structure prevents unwanted flexibility, which means that the vehicle rigidly, directly and with practically no torsion.

45 percent of the intelligently designed, weight-optimised aluminium spaceframe is made out of aluminium sections, 31 percent out of aluminium sheet, 20 percent out of cast aluminium and 4 percent out of steel. Maximum occupant safety requires the use of ultra-high-strength, heat-formed steel in the A-pillars. The bodyshell weighs a mere 241 kilograms – an absolute benchmark in the super sports car segment in relation to the peak output of 420 kW.

Low centre of gravity and transverse reinforcing struts for superb dynamism

The entire vehicle concept has been adjusted for the lowest possible centre of gravity. This applies both to the low connection of the powertrain and axles, as well as to the arrangement of the rigidity-conducive bodyshell structure, which has been kept as low as possible. Examples include the rigid flexural and torsional connections between the front and rear section and the safety passenger cell, which have been realised consistently using force paths that are as low as possible. This results not only in a low centre of gravity but also in a harmonious and therefore efficient force path in the vehicle structure.

Another prominent feature of the lightweight construction are the transverse reinforcing struts at the front and rear axles, which are integrated into the bodyshell structure. The sections connect the side members precisely where the highest forces act upon the bodyshell under dynamic cornering. The advantages of this sophisticated solution include unrivalled transverse rigidity and the absence of heavy secondary reinforcement or supports.

Weight-optimised gullwing doors, body of aluminium and plastics

Lightweight construction is also the uncompromising guiding principle for the gullwing doors. During the production process for the outer door skin and interior, so-called superplastic forming - in this process, the aluminium panels and the forming tools are preheated to 500 degrees - makes it possible to dispense with multi-part components. This not only saves weight, but also simplifies the production process. Comfortable opening and closing of the gullwing doors is ensured by the specially reinforced window frames.

The aluminium spaceframe caries an equally lightweight outer skin: the bonnet, wings, gullwing doors and the side walls and roof are of aluminium, while the front and rear aprons, side skirts and boot lid are of plastic. The boot lid not only accommodates the automatically extending aerofoil, but – invisible from the outside – also the aerial systems for the radio, telephone and navigation.

Exemplary aerodynamics for an exceptionally high degree of handling stability

The best possible handling stability, low drag and low wind noise – the aerodynamic requirements for the SLS AMG were extremely demanding during its design and development. The specialists at Mercedes-Benz and AMG invested a great deal of time to achieve the best possible aerodynamic balance – with the help of computer simulations, tests in the wind tunnel and test drives on various high-speed tracks. The result is a combination of slight lift at the front axle and some downforce at the rear axle. This is a desirable combination for a car with a front-mid-engine, as it ensures dampened responses to steering impulses at high speeds. Thanks to this aerodynamic configuration, critical driving situations can be prevented at source – for example during a sudden avoiding manoeuvre at high speed. The driver benefits from a constant feeling of safety and stability. All in all, the aerodynamic balance of the SLS AMG places it in the top echelon of the super sports car segment.

The downforce at the rear axle is determined by the automatically extending aerofoil. This feature attractively integrated into the boot lid extends at 120 km/h,

and acts together with the rear diffusor to ensure the right downforce at the rear axle – with a particularly positive effect at high speeds. The aerofoil retracts again when the speed falls below 80 km/h. If required by the driver, the rear aerofoil can also be manually extended by pressing the relevant button in the AMG DRIVE UNIT. The aerodynamically efficient shape of the A-pillars, which have no drainage channels, the exterior mirrors fitted to the beltlines and the rounded B-pillars ensure that the airflow strikes the aerofoil at favourable angles in all speed ranges. The rigidity of the rear aerofoil is so designed that its angle of pitch is specifically modified by the air pressure at high speeds, which leads to improved air resistance with only a slight change to the rear axle downforce.

Good Cd value of 0.36

With a Cd value of 0.36 and a cross-sectional area (A) of 2.13 sq. m., the air resistance (Cd x A) amounts to 0.77 sq. m.. These figures are achieved by a favourable airflow into the front-end cooler modules and a precisely calculated airflow through the engine compartment. Spoilers in front of the front wheels improve the airflow around the tyres and reduce lift. The front wheel arch linings feature vertically installed louvres which conduct the airflow away from the radiator area with no effect on lift.

The engine compartment cladding, the almost completely smooth underbody and the rear diffusor play an important part in the aerodynamics of the SLS AMG. The favourable design of the front apron with a centrally integrated spoiler lip, plus the diffusors fitted at the sides of the engine compartment cladding, enable front axle lift to be effectively reduced. The rear diffusor is clearly visible between the exhaust tailpipes: this directs the airflow upwards, acting together with the aerofoil to create a downforce at the rear axle – in fact no less than 20 kilograms at the top speed of 317 km/h.

Painstaking attention to detail has also paid off where the boot lid is concerned: this is where air turbulences are normally created which can brake the airflow and unnecessarily increase fuel consumption. This is prevented by a discreet spoiler lip in the centre area of the boot lid edge, which effectively cuts off the airflow.

Low wind noise thanks to sophisticated aero-acoustics

The low wind noise of the SLS AMG is likewise a result of these extensive tests; this also contributes greatly to the long-distance comfort typical of any Mercedes. Not only the small, rounded surfaces of the doors and the flush side windows, but also the design of the A-pillars, door handles and exterior mirrors have a positive effect on this aspect. Effective sealing systems and the deliberate absence of drainage channels in the A-pillars further illustrate the sophisicated aero-acoustics of the SLS AMG.

Minimisation of soiling to the exterior mirrors, side windows and rear window makes a major contribution to active safety. The special shape of the exterior mirror housings redirects dripping rainwater to almost entirely prevent soiling of the mirror lenses and side windows. The side windows also have a water-repellent coating to optimise all-round visibility in poor weather conditions.

High standard of safety and the quality typical of a Mercedes

The new Gullwing model also meets the high passive safety standards that are traditional at Mercedes-Benz. Right from the outset, the specified lightweight construction and outstanding crash characteristics were designed to be in line with the car's low centre of gravity and the best possible distribution of load paths. The latter are specifically conducted around the occupants – this applies to front, rear-end and lateral collisions, as well as to roof impacts.

The entire bodyshell design is based on what actually happens in accidents. During a frontal collision, for example, the continuous side member extends from the front cross-member to the side skirt, and directs the impact energy into the extremely rigid structure of the door sill. As a result the passenger compartment remains undistorted during the usual frontal impact tests. One typical characteristic of the SLS is the front-mid-engine layout of the drive unit. This positioning behind the front axle provides a large deformation zone in front of the engine. This in turn allows a firewall of reduced weight, as it is required to absorb far less energy during a frontal crash than in a vehicle with a conventionally positioned engine.

The torque tube connecting the engine to the double-declutch transmission located at the rear axle also helps during a crash: in the event of either a frontal or rear-end collision, the torque tube lowers the stresses on the bodyshell by specifically transferring and dissipating the impact forces. During a lateral impact, protection is provided by a side impact reinforcement of cold-formed, ultra-high-strength steel which is integrated into the gullwing doors. This is supported by the relavent A and B-pillars, and transfers the impact forces to the body structure via special elements. The load paths in the areas of the door waistlines are optimised by multilayered reinforcing sections.

Front impact: the crash load paths are directed around the passengers

Computer simulation of overall vehicle crashes

Sophisticated computer simulations helped to optimise all the structural components. To verify the results, a great number of overall vehicle crashes were simulated by computer. The aim was to achieve an outstanding crash performance combined with low weight. The relevant structural cross-sections were dimensioned according to the expected loads and load paths. The salient factors were the geometrical layout of the load paths and selection of the most suitable aluminium alloys for each component with respect to energy absorption, rigidity and

strength. Choosing the best possible joining techniques and defining the wall thicknesses for all the components, taking into account the loads encountered during normal operation and during a crash, were also of decisive importance.

During the course of its development, the SLS AMG was subjected to a high number of crash tests, plus additional component tests to verify the results. The new super sports car complies with all country-specific impact configurations necessary for an operating licence. Plus all the current ratings and consumer tests, and also the particularly demanding, in-house impact tests of which some go well beyond the legal requirements. Passing these is a precondition for the highest accolade in automobile safety: the Mercedes star.

The very latest restraint systems, with eight airbags

The sophisticated body structure is perfectly complemented by the very latest restraint systems. Three-point seat belts with belt tensioners and belt force limiters are provided as standard for occupants of the SLS AMG. These are complemented with eight airbags: two adaptive airbags for the driver and passenger, a kneebag for each, two sidebags integrated into the sports seats and two separate windowbags deploying from the waistlines of the gullwing doors.

Exclusive, hand-built production

The aluminium spaceframe and body are hand-built with strict adherence to stringent quality standards. Highly qualified specialists join the aluminium components together using the very latest processes. The most suitable joining techniqe is used for the relevant requirement – riveting, bonding, welding and bolting. It goes without saying for every new vehicle from Mercedes-Benz that the greatest precision during production guarantees the highest possible product quality.

Perfectly tailored for two

- **Wide-opening gullwing doors for easy entry and exit**
- **Sports seats with magnesium backrests**
- **AMG DRIVE UNIT for individualised set-up**
- **Extensive standard appointments including COMAND APS**
- **Bang & Olufsen BeoSound AMG surround sound system**

The low seating position typical of a sports car, perfect ergonomics and a high level of long-distance comfort – the occupants of the SLS AMG are treated to a very special interior. One important criterion for customer satisfaction is ease of access and egress through the exclusive gullwing doors. At the design stage great attention was paid to the widest possible opening angle – it is a full 70 degrees. Equally importantly, the distance between the open doors and the road surface is a generous 1.49 metres, while the entry aperture between the open doors and the upper edge of the door sills measures no less than 1.08 metres. The entry height, i.e. the distance between the road surface and the door sills, is a very low 45 centimetres. As another important criterion for dignified access and egress, thanks to two gas-pressure struts positioned next to the door hinges only very little pressure is required when opening and closing the doors – even at very low ambient temperatures.

The gullwing doors require less opening space than conventional coupé doors, and can be fully opened in a standard garage. The door is opened from inside by a handle finished in Silver Shadow. The grip section of the armrest moulded into the interior door panel enables problem-free door closing. The operating keys for the power windows, central locking system and exterior mirror adjustment are also located in the interior door panels for easy access.

Low seating position, sports seats with magnesium backrests

A seating height of only 368 millimetres above the road surface guarantees that typical sports car feeling. At the same time the relatively steep angle of the windscreen ensures good all-round visibility. The feeling of comfortable spaciousness is in large measure due to the generous shoulder-room of 1483 millimetres and elbow room of no less than 1606 millimetres. In conjunction with the generous maximum headroom of 990 millimetres and effective legroom for the driver of 1058 millimetres, the result is a low but extremely relaxed seating position.

The sports seats with integrated head restraints feature so-called two-zone seat cushions. Prominent side bolsters with a harder foam filling provide optimal lateral support, while the inner areas of the seat cushion and backrest are softer for a high level of comfort on long journeys. A black designo leather interior is standard equipment. The seat backrests are made from magnesium, a high-tech material that combines light weight with high strength. This leads to significant advantages where weight distribution and a low centre of gravity are concerned.

The fore-and-aft position, seat height, backrest angle, seat cushion angle and steering column are fully electric with Memory package. In addition three individual seat positions can be stored in memory. The Memory package also includes four-way lumbar supports and adjustable side bolsters in the seat backs for better lateral support when cornering at speed. Standard appointments also include three-stage seat heating.

Performance steering wheel with high-quality, solid metal trim

The adjustment range of the Performance steering wheel is 60 millimetres axially and 2.3 degrees either up or down – this applies to both manual and electric adjustment. The steering wheel is lined in perforated leather in the specially formed grip area, and has high-quality, solid metal trim and a rim with a diameter of 370 millimetres, which a flattened profile in the lower section. The best possible vehicle control is not least ensured by the specially formed steering wheel cross-section. A Performance steering wheel in leather/Alcantara is available as an option.

The seven gears of the double-declutch transmission are shifted using solid metal shift paddles. A brief pull on the left (–) or right (+) shift paddle is enough to engage the required gear. Multifunction keys in the left and right steering wheel spokes provide rapid access to the audio, telephone and navigation functions, and to the LINGUATRONIC voice-operated control system. The main menu in the instrument cluster can also be accessed using the ergonomically shaped steering wheel keys.

AMG DRIVE UNIT with new E-SELECT lever

One of the visual and functional highlights in the interior of the SLS AMG is the solid centre console, which immediately calls an aircraft cockpit to mind. All the central control functions including the AMG DRIVE UNIT, which is inclined towards the driver, are grouped on this striking, carbon fibre feature. The new AMG E-SELECT shift lever for the AMG SPEEDSHIFT DCT 7-speed sports transmission also has a jet aircraft look: the one-touch drive-by-wire system enables the driver to shift between P, R, N and D extremely rapidly. When the car is stationary, simply pressing the P-key activates the parking position – this also happens automatically when the engine is switched off. To the left are the rotary controls for the transmission's driving modes, including RACE START, as well as the keys for engine starting, the ESP® functions, the AMG memory function and the extendable rear aerofoil.

The AMG instrument cluster provides a wealth of information

The instrument cluster is ideally positioned in the driver's field of vision. The two dial instruments indicate the vehicle speed and engine revs, with two small displays showing the fuel level and engine oil temperature integrated into them. When the ignition is switched on, the needles of the speedometer and rev counter spin round to their maximum position in unison, then immediately return to their original position. A 4.5-inch central display is positioned between the dial instruments. This shows e.g. the odometer reading, remaining range, fuel consumption, driven distance and time and average speed. The AMG main menu not only shows the tyre pressure of each individual wheel, but also has three modes providing comprehensive driver information: "Warm Up", "Set Up" and "RACE". Warm Up shows the coo-

lant and transmission oil temperatures, while Set Up shows the currently selected ESP® mode. Race displays the RACETIMER, which enables the driver to record lap times on a racetrack. All the functions in the central display can be conveniently controlled using the multifunction keys in the steering wheel.

Permanently displayed information includes the currently selected gear and the activated driving mode of the double-declutch transmission – plus the time of day, ambient temperature and digital speed. Information on the navigation system, audio functions and telephone, individual vehicle settings and the ASSYST PLUS service interval display can be accessed in the central display. The gearshift indicator is located above the display, and therefore ideally in the driver's field of vision: seven LEDs coloured white, yellow and red indicate the necessary upshift if the driver of the SLS AMG has selected the manual (M) transmission mode. The faster the engine speed approaches the maximum of 7200 rpm, the more LEDs light up.

COMAND APS with DVD player as standard equipment

The centre console is also designed with the best possible ergonomics in mind. The upper section has an array of keys for the COMAND APS multimedia system. All the functions of the radio, DVD player, telephone and navigation system can be controlled from here. When switched on, the 7-inch colour display in the dashboard shows the unmistakable AMG logo for ten seconds – and depending on the function, a high-resolution map or other information such as the radio station, music track or telephone keypad. The navigation system has a 40-gigabyte hard disc on which the navigation data are stored, which means that route calculation is extremely rapid.

The car radio with integrated CD/DVD player features an FM/MW/SW and LW twin tuner with automatic station search, a 4 x 25 watt amplifier and a total of 6 loudspeakers. In addition, COMAND APS includes a music server with a memory capacity of 6 gigabytes, which enables the driver to store up to 1000 music files. A DVD player for video and audio is also on board, and an integrated 6-disc DVD changer is available on request. Below the DVD aperture the unit has an adapter that enables various PC memory cards for the reproduction of music

files to be used. External audio devices such as an "iPod" can be connected to COMAND APS via the Media Interface. As a standard feature, Mercedes-Benz combines COMAND APS with the LINGUATRONIC voice-operated control system and the Bluetooth interface, which provides a wireless connection between the mobile phone and the hands-free system.

The Controller directly integrated into the centre console operates the mutimedia system COMAND APS. This rotary/push control can be moved in seven directions: turning the controller selects the main menu and submenus on the display, while pushing it activates or confirms the displayed function or setting. The buttons next to the Controller marked with "R" and "C" symbols are used to quit submenus quickly or delete entries.

Bang & Olufsen BeoSound AMG surround sound system as standard

The new sound system realised by Mercedes-Benz and AMG together with the famous Danish audio specialist Bang & Olufsen was developed specifically for the SLS AMG. The surround-sound system with Dolby Digital 5.1 provides an exclusive listening experience at the highest level. This is not only thanks to the amplifier with a total output of 1000 watts and 11 loudspeakers, but also to the sound processor's precise distribution of the music signals to selectable driver, passenger or central positions. The digital sound processor (DSP) also makes it possible to choose between a high-end studio sound ("Reference") and surround-sound. All the functions are controlled via a special Bang & Olufsen menu in COMAND APS. Particular highlights are provided by the two 250-watt subwoofers integrated into the parcel shelf and the illuminated 50-watt tweeters on the dashboard. High-quality loudspeaker covers bearing the Bang & Olufsen logo indicate the exceptional status of this high-end system.

Where climatic comfort is concerned, the new Gullwing sports car likewise meets the high expectations that await a super-sports car from Mercedes-Benz and AMG. The sophisticated THERMOTRONIC two-zone comfort automatic climate control system is included as standard. A powerful air conditioning compressor ensures rapid cooling of the interior; the cooled air flows from the four multi-adjustable vents in the dashboard, two apertures in the A-pillars, three on the windscreen and one in each footwell. Sensors constantly monitor the interior temperature, the temperature of the air flowing from the air vents, the air moisture content and the intensity and angle of the sun. A pollutant sensor recognises excessive carbon monoxide and nitrogen oxide concentrations in the outside air, and automatically closes the air recirculation flap if levels of these pollutants increase rapidly.

The modern, short-travel control keys in the SLS AMG require an operating force of only four newtons. All keys and switches are treated with Softtouch paint, which creates a silky sheen and a soft surface. The homogeneous, amber-coloured illumination of the control symbols ensures easy recognition, and also underlines the high-quality appearance of the interior when driving at night.

A wealth of stowage spaces for typical Mercedes day-to-day suitability

The interior of the SLS AMG also impresses with the practical stowage space that makes for the day-to-day suitability typical of a Mercedes. The 3.7-litre glove compartment with a spectacles compartment is integrated into the dashboard on the passenger side. To the right of the E-SELECT shift lever there is a small stowage tray with a 12 V socket, or on request an ashtray with cigar lighter. The armrest behind the centre console not only serves to operate the COMAND Controller: at the touch of a button, the armrest can be moved in two stages to reveal a stowage compartment underneath; this has two cupholders and the telephone cradle. Other items can be stowed on the rear wall between the seats and in the parcel net in the passenger footwell. Two fixed clothes hooks are attached to the seat backrests, while those in the roof liner fold down and are silicon-insulated.

The button to unlock the boot lid is located underneath the light switch. Alternatively the boot can be opened using the button on the ignition key. The luggage compartment has a capacity of up to 176 litres.

Overview of the comprehensive standard equipment (selection):

- COMAND APS
- 6-disc DVD changer
- Bang & Olufsen BeoSound AMG surround sound system
- Media interface
- Floor mats with AMG logo
- Interior in black *designo* leather
- Memory package with electric seat and steering column adjustment, as well as a four-way lumbar support
- Anti-theft alarm system with tow-away protection and interior monitoring
- Electric parking brake
- Headlamp Assist
- KEYLESS-GO start function
- PARKTRONIC
- Rain sensor
- Tyre pressure monitoring system
- Heated sports seats
- Sports pedals in brushed stainless steel with rubber studs
- Cruise control with SPEEDTRONIC
- THERMOTRONIC
- Carbon-fibre trim (front stowage tray and rear stowage compartment incl. lid, AMG DRIVE UNIT surround, surrounds for the centre console, shiftgate and rear, trim strips for centre console and door armrests

Optional extras include the following:

- Interior appointments in *designo* single-tone Exclusive leather
- Interior appointments in *designo* two-tone Exclusive leather
- Interior appointments in *designo* Exclusive light brown natural leather/woven leather

- Paintwork in "AMG ALU-BEAM silver"
- Paintwork in "AMG monza grey magno"
- Paintwork in "*designo* magno allanite grey"

The AMG Performance Studio also enables even the most discerning individual customer requirements for the SLS AMG to be met:

- Carbon-fibre exterior mirrors
- Carbon-fibre engine compartment cover
- Interior Carbon Package (carbon-fibre trim, trim on seat backrest and side, door sill panels)
- Light-alloy wheels in a 5-twin-spoke design, size 9.5 x 19 inches (front) and 11.0 x 20 inches (rear), tyre sizes 265/35 R 19 (front) and 295/30 R 20 (rear)
- Performance suspension with a stiffer setup for optimum lateral dynamics
- Performance steering wheel in leather/Alcantara
- Forged wheels in a 10-spoke design, size 9.5 x 19 inches (front) and 11.0 x 20 inches (rear), with tyre size 265/35 R 19 (front) and 295/30 R 20 (rear)
- Sports bucket seats

Virtual and real – digital and real prototypes for the highest requirements

- **AMG with overall responsibility for design and development**
- **Start of the design phase for the SLS AMG in 2006**
- **Worldwide prototype testing since 2008**
- **Endurance trials on the North Loop of the Nürburgring**
- **More than 40 SLS AMG test cars in continuous operation**

For the first time in its more than 40-year history, Mercedes-AMG GmbH has carried full responsibility for the design and development of a completely new car. This is not only solidly based on more than four decades of motor racing experience, but also on enormous know-how in the production of luxurious, high-performance cars plus networked development with selected Mercedes-Benz departments at the Mercedes Technology Center (MTC) in Sindelfingen.

Exhilarating driving dynamics and the day-to-day suitability typical of a Mercedes were central attributes in the specifications for the Mercedes-Benz SLS AMG. When realising and implementing their ambitious aims, the specialists at Mercedes-AMG in Affalterbach relied on the latest simulation programmes and sophisticated practical trials on every continent. The design and development of the new super sports car were concluded and approved at the end of 2006.

Digital prototype as the basis for the first physical prototypes

Before the first physical prototype could be built, the virtual prototypes had to be put through their paces. Accordingly the new Gullwing model was first brought to life on the computer screen as a digital prototype (DPT). Extensive research on this basis helped to establish how the objectives for the new super sports car could be achieved. Whether weight distribution, the installed position of the engine, centre of gravity, axle configuration, driving dynamics, aerodynamics,

ergonomics, crash behaviour or the production process – the very latest simulation programmes allowed a realistic reflection of the vehicle and all its characteristics. The digital prototype was therefore a complete, virtual automobile.

The digital prototype was also a help in planning and building the first driveable technology carriers, i.e. cars equipped with the primary technical components such as the engine, brakes and axles – so-called "mulettos". Thanks to the virtual preparation work, these test vehicles in use since spring 2007 already had a very high level of maturity from the start. Ultra-modern measuring technology in these vehicles supplied valuable findings on e.g. the temperatures of the engine oil, coolant and brake discs – with an additional focus on lap times around the North Loop of the Nürburgring, for example, as well as measurable, precisely defined handling manoeuvres as a basis for comparing different axle kinematics or spring/damper variations.

The first disguised, physical prototypes of the SLS AMG have been undergoing worldwide trials since 2008. Whether for the air conditioning, tyres, suspension, engine cooling, dynamic control systems or brakes, this standardised, highly sophisticated development and testing programme on test tracks and racing circuits, Alpine passes and specifically chosen public roads is aimed at achieving continuous further development and the identification of problem areas – and therefore the highest possible quality. More than 40 vehicles are in continuous operation for these tests.

In addition to these tests, individual components such as the engine, powertrain, transmission, axles and brakes, as well as the complete body structure, are tested to their limits on test rigs.

"Accelerated" endurance testing under the toughest of conditions

The extensive programme of vehicle development is supplemented by an endurance test which simulates an entire vehicle lifetime under the toughest of conditions in a relatively short time. The aim is to ensure a high degree of maturity before vehicle production can being at the Mercedes-Benz plant in Sindelfingen.

The endurance testing at a glance:

Long-term testing on a variety of different roads:

- all the components and systems are tested together in everyday operation. Loaded up to their permitted gross vehicle weight, the test cars are put through a precisely defined test programme on country roads, on motorways and in city traffic.

Endurance testing on heathland:

- in this case, the developers focus on the durability of the chassis and suspension components, the entire bodyshell and the integral subframe on which the front axle, steering and engine are mounted. The test cars are loaded up to their permitted gross vehicle weight.

"Accelerated" endurance testing:

- testing of the entire vehicle, focussing on the powertrain, chassis and suspension. Special features of the AMG programme include 10,000 kilometres on the Nürburgring's North Loop and 10,000 kilometres in city traffic.

Full-load endurance testing:

- extreme acceleration and braking manoeuvres with a high proportion of full-load operation, making extreme demands on the cooling, fuel-delivery and braking systems.

World endurance testing:

- testing of the entire vehicle, focussing on the powertrain and suspension Body

Long-term corrosion testing:

- corrosion testing of the entire vehicle simulates the toughest dynamic and climatic environmental influences.

Final board approval:

- all-inclusive verification of the degree of development and production maturity.

When development concluded in January 2010, around 40 test cars absolved a distance of approx. 1.25 million test kilometres.

Mercedes-Benz SLS AMG

Engine		
Number of cylinders/arrangement		8/V, 4 valves per cylinder
Displacement	cc	6208
Bore x stroke	mm	102.2 x 94.6
Rated output	kW	420 at 6800 rpm
Rated torque	Nm	650 at 4750 rpm
Compression ratio		11.3 : 1
Mixture preparation		Microprocessor-controlled petrol injection, HFM
Power transmission		
Drive system		Transaxle
Transmission		AMG SPEEDSHIFT DCT 7-speed sports transmission
Ratios	Final drive	3.67
	1st gear	3.40
	2nd gear	2.19
	3rd gear	1.63
	4th gear	1.29
	5th gear	1.03
	6th gear	0.84
	7th gear	0.72
	Reverse	-2.79
Chassis and suspension		
Front		Aluminium double-wishbone suspension, anti-dive, coil springs, gas-pressure shock absorbers, stabiliser
Rear		Aluminium double-wishbone suspension, anti-squat and anti-dive, coil springs, gas-pressure shock absorbers, stabiliser
Braking system		Composite disc brakes, internally ventilated and perforated at the front, internally ventilated and perforated disc brakes at the rear, electric parking brake at the rear, ABS, Brake Assist, 3-stage ESP®
Steering		Speed-sensitive rack-and-pinion steering, steering damper
Wheels		Front: 9.5 J x 19; rear: 11 J x 20
Tyres		Front: 265/35 R 19; rear: 295/30 R 20
Dimensions and weights		
Wheelbase	mm	2680
Track, front/rear	mm	1682/1653
Overall length	mm	4638
Overall width	mm	1939
Overall height	mm	1262
Turning circle	m	11.9
Boot capacity*	l	176
Kerb weight	kg	1620
Payload	kg	240
Perm. gross vehicle weight	kg	1935
Tank capacity/incl. reserve	l	85/14

Performance and fuel consumption		
Acceleration 0 - 100 km/h	s	3.8
Top speed	km/h	317**
Fuel consumption	l/100 km	13.3
CO_2 emissions	g/km	311

** electronically limited