



Press Information
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The S-Class from Mercedes-AMG: Perfect synthesis of luxurious comfort and driving dynamics with E PERFORMANCE

- Performance hybrid with Formula 1™ technology transfer to new Mercedes-AMG S 63 E PERFORMANCE
- Improved AMG high-performance battery with 13.1 kWh capacity (10.36 kWh usable)
- Handcrafted AMG 4.0L V8 biturbo engine at the front and electric motor at the rear axle for 791 hp combined system output – the most powerful S-Class of all time
- Active roll stabilization and active rear-axle steering fitted standard
- AMG-specific radiator grille featured on the performance luxury sedan for the first time

Affalterbach. The S-Class has always played an important role for Mercedes-AMG. More than 50 years ago, the founders proved they could transform a luxury sedan into a very sporty vehicle with the Swabian spirit of innovation. The performance and sports car brand from Affalterbach set its first milestone in 1971 with the Mercedes-Benz 300 SEL 6.8 AMG. Today, the new Mercedes-AMG S 63 E PERFORMANCE with AMG performance hybrid technology once again sets the benchmark in the segment. The E PERFORMANCE model combines the Handcrafted AMG 4.0L V8 biturbo engine with an AMG-specific hybrid powertrain and a new expansion stage of the AMG high-performance battery (HPB). The new HPB 150 is based on the high-performance and directly cooled battery cells of the well-known HPB 80. The battery capacity increases from 6.1 kWh in the HPB 80 to 13.1 kWh in the HPB 150.

The focus of the powertrain, however, is less on electric range and more on best-in-class performance. With a combined system output of 791 hp and 1,055 lb-ft of combined system torque¹, the AMG S 63 E PERFORMANCE sets new standards in the segment. Acceleration from 0 to 60 mph takes just 3.3 seconds. Systems such as the AMG RIDE CONTROL+ suspension, AMG ACTIVE RIDE CONTROL roll stabilization, and rear-axle steering – all fitted standard – ensure a wide spread between driving dynamics and comfort.

"Engineered in Affalterbach stands for Performance Luxury in all of our product segments, and the new Mercedes-AMG S 63 naturally embodies this high standard par excellence. It is already the third model with our AMG-specific E PERFORMANCE hybrid technology, which is derived from our Formula 1 drive unit. The innovative drive concept enables purely electric driving and makes our S 63 the most powerful and most dynamic S-Class of all time. Of course, the S 63 also meets all customer requirements with its equipment features and materials at the highest level and is thus the perfect combination of exclusivity and superior performance."

Michael Schiebe, Chairman of the Board of Management of Mercedes-AMG GmbH and
Head of Mercedes-Benz G-Class & Mercedes-Maybach Business Units

Expressive exterior design

The impressive performance of the Mercedes-AMG S 63 E PERFORMANCE is also suggested by the expressive exterior design. For the first time, an S-Class Sedan bears the AMG-specific radiator grille with vertical louvers and a large central star. The previous Mercedes star on the hood has been replaced by the AMG emblem in

silver chrome/black. In addition, the front fascia with AMG's jet-wing design with large side air inlets and functional air curtains characterizes the front view. In profile, the up to 21-inch AMG forged wheels and the AMG-specific side sill panels particularly stand out. At the rear, there are characteristic design features of the "63" models such as the trapezoidal, fluted twin-tailpipes and the wide diffuser with longitudinal fins and diffuser board.

Elegant interior with First-Class rear compartment

The interior combines the high-quality appointments of the S-Class with AMG-specific features. The seats, with a special AMG upholstery and distinctive stitching, underline the refined appearance. Exclusive colors and various Nappa leather upholsteries with an embossed AMG emblem in the front headrests emphasize the sporty and luxurious aspects of the S 63 E PERFORMANCE. Its position as a leader in the segment is also made clear by the First-Class rear cabin and multicontour seats for four occupants. This is further emphasized by AMG-specific trim elements and the standard AMG Performance steering wheel with AMG DRIVE UNIT steering wheel buttons.

MBUX multimedia system with hybrid-specific displays

The MBUX infotainment system features various AMG- and hybrid-specific displays and functions. These include the displays in the instrument cluster, multimedia central display in the center console and head-up display.

The instrument cluster view can be personalized with different display styles and individually selectable main views. The AMG-specific "Supersport" style offers the option of displaying various content via a vertical menu structure. These include a menu with hybrid-specific temperatures or a set-up menu that displays the current settings for the suspension or transmission. Drivers can also tailor the display to show the navigation map, fuel consumption data or telemetry data via the AMG TRACK PACE MBUX App.

The head-up display also offers AMG's own display styles such as "Race" and "Supersport." These can be accessed via the main menu in the instrument cluster. High-quality graphics in the multimedia display visualize the power flow of the entire drive system, speed, output, torque and temperature of the electric motor, as well as battery temperature.

The Dolby Atmos® sound format takes the interior audio experience to a new level. Individual instruments or voices in the studio mix can be positioned all around the listening area. A new kind of sound animation thus becomes possible. While conventional stereo systems feed two channels to the speakers, Dolby Atmos® can use the entire range and create a 360-degree experience.

AMG Performance steering wheel in twin-spoke design

The AMG Performance steering wheel with its distinctive twin-spoke design and seamlessly integrated gearshift paddles also contributes to the hallmark AMG look. The AMG DRIVE UNIT steering wheel buttons impress with their brilliant displays and intuitive operating logic. They allow important driving functions and all driving modes to be controlled without the driver's hands leaving the steering wheel. The recuperation levels of the hybrid drive can also be selected via the steering wheel buttons.

The AMG-specific E PERFORMANCE hybrid drive: combustion engine in the front, electric motor in the rear

In the new Mercedes-AMG S 63 E PERFORMANCE, the Handcrafted AMG 4.0L V8 biturbo engine is combined with a permanently excited synchronous electric motor, a high-performance battery developed in Affalterbach and the variable AMG Performance 4MATIC+ all-wheel drive system. The combined system output of 791 hp and 1,055 lb-ft of combined system torque¹ make for impressive driving performance. Acceleration from a standstill to 60 mph takes just 3.3 seconds. Power delivery ends at an electronically limited 155 mph.

The 188 hp electric motor is positioned at the rear axle, where it is integrated with an electrically shifted two-speed transmission and electronically controlled limited-slip rear differential to form a compact electric drive unit (EDU). Experts refer to this layout as a P3 hybrid. The high-performance battery is also located in the rear above the rear axle.

The decisive advantage of this EDU position is bypassing of the 9-speed transmission, which is mated to the V8 engine. As it is positioned behind the transmission, the torque of both drive units can be fully utilized. The result is 1,055 lb-ft of combined system torque¹ – a new record in this class. There are numerous other advantages to this design including:

- The P3 concept makes it possible to boost electrically at full torque across the entire rpm range.
- The electric motor acts directly on the rear axle and can therefore convert its power more directly into propulsion – for that extra boost when moving from a stop, accelerating or overtaking.
- The inherent design of the electric motor means immediate power delivery at full torque, making particularly agile starting possible.
- In addition, the driver immediately experiences a noticeable performance increase thanks to the integrated, electronically controlled limited-slip rear differential: the hybrid model accelerates out of corners with great agility.
- In the event of wheel slip at the rear axle, the drive power from the combustion engine and electric motor is also transferred to the front wheels as required. This is made possible by mechanical connection of the variable AMG Performance 4MATIC+ all-wheel drive by means of the driveshaft and axles of the front wheels. It also enables all-electric driving with all-wheel drive.
- The positioning at the rear axle improves the weight and axle load distribution in the vehicle. This forms the basis for agility and handling.
- The AMG concept offers very high recuperation efficiency, as the system allows only minimal mechanical and hydraulic losses from the engine and transmission. In the "Comfort" driving mode, the combustion engine can be specifically disconnected. This reduces drag torque when the driving situation permits.
- The two-speed transmission at the rear axle shifts automatically. With its specially tuned gear ratio, it ensures a combination of high wheel torque for agile starting and smooth, continuous performance at higher speeds. An electric actuator engages second gear by approximately 87 mph, which corresponds to the electric motor's maximum speed of around 13,500 rpm.
- With the increase in performance due to the additional electric motor, the development team was also able to improve the efficiency of the entire vehicle in parallel.

Permanently excited synchronous motor (PSM)

The PSM is equipped with a hollow rotor made of permanent magnets and can thus be installed around the output shaft to the left rear wheel. The electric motor is controlled by power electronics, which are likewise located at the EDU and convert accelerator pedal commands directly to suitably actuate the PSM. In addition, the sensitive control of the electric motor adjusts the speed during gearshifts by the two-speed transmission. This means that the transmission in the EDU does not require any mechanical synchronization at all, and the boost torque of the electric motor can thus be used at higher speeds. The maximum torque of an electric motor is available from the first revolution, but drops again later at higher rpm, therefore, the second gear, which is engaged at higher speeds, brings the electric motor into a range with lower rpm, so that it can support the combustion engine over the entire rpm range.

Inspired by Formula 1™, developed in Affalterbach: the AMG high-performance battery

When the electrification strategy was being defined, it was clear from the outset that all essential components would be developed in Affalterbach. Among these is the AMG high-performance battery (HPB). The development of the lithium-ion energy storage system is inspired by technologies that have proven themselves in the Mercedes-AMG Petronas F1 Team's Formula 1 hybrid race cars. The team of experts from the Formula 1 engine manufacturer High Performance Powertrains (HPP) in Brixworth, UK collaborated closely

with Mercedes-AMG in Affalterbach. The AMG high-performance battery combines high power that can be called up in rapid succession with low weight to enhance the overall performance of the vehicle. Added to this is a fast energy draw and high power density.

94 hp continuous output and 188 hp peak output

The high-performance battery in the S 63 E PERFORMANCE has a capacity of 13.1 kWh (10.36 kWh usable), more than twice as much as the already familiar HPB 80. It delivers 94 hp of continuous mechanical power and 188 hp of peak mechanical power for ten second intervals to the electric motor. External charging takes place via the 3.7 kW onboard AC charger, at a charging station, wallbox or household socket. The battery is designed for fast power delivery and draw rather than longest possible range.

The continual push for innovation: direct cooling of the battery cells

The basis for the high-performance of the AMG 400-volt battery is direct cooling. A high-tech coolant based on an electrically non-conductive liquid flows around all 1,200 cells and cools them individually. Every battery needs a defined temperature for optimum power delivery. If the energy storage unit gets too cold or too hot, it temporarily loses noticeable power or has to be turned down in order not to be damaged. The consistent temperature of the battery therefore has a decisive influence on its performance, service life and safety. If the thermal management does not fulfill its function optimally, the battery is at risk of aging prematurely.

For direct cooling, the AMG team had to develop new cooling modules of millimetric thickness. Around 3.7 gallons of coolant circulate from top to bottom through the entire battery, past each cell, with the help of a specially developed high-performance electric pump. In the process, the coolant also flows through an oil/water heat exchanger attached directly to the battery. This conducts the heat into one of the two low-temperature circuits (LT) of the vehicle. From there, it goes on to the LT cooler at the front of the car, which dissipates heat into the outside air. The system is designed to ensure even heat distribution in the battery.

The result is the battery is always within a consistent, optimum operating temperature window averaging 113 degrees Fahrenheit, no matter how often it is charged or discharged. Should this average temperature be exceeded, protection mechanisms are configured to allow maximum power to be drawn from the battery in order to subsequently lower the temperature level again through direct cooling. Even under heavy load, where acceleration (battery is discharged) and deceleration (battery is charged) are frequent, the AMG High-Performance Battery retains its high-performance capacity.

Only effective direct cooling makes it possible to use cells with a very high power density. Thanks to this individual solution, the battery system is particularly light and compact. The material-saving conductor rail concept also contributes to the low weight. The lightweight, robust crash structure of the aluminum housing ensures maximum safety.

Regeneration selectable in four stages

Because the high-performance battery is always in the optimum temperature window of approximately 113 degrees Fahrenheit, recuperation can also be optimized. Normally, a battery heats up at high regeneration capacity, so energy recovery must be limited.

Recuperation starts when the driver takes their foot off the accelerator pedal. This charges the battery and creates braking torque. On steep descents, the system works like an engine brake and feeds energy into the battery. The driver can select four different levels of recuperation, using the right-hand AMG DRIVE UNIT steering wheel button. With the exception of "Slippery," this applies to all driving modes as well as in "ESP Sport Handling" or "ESP Off," and the energy recovery is configured differently depending on the driving mode.

- **Level 0:** The vehicle behaves in a similar way to a conventional combustion engine with a manual transmission, where the clutch is disengaged. If the driver lifts off the accelerator, the car coasts on with the least resistance. The recuperation level is very low and serves only to maintain the vehicle's power supply. With the combustion engine switched off, friction losses in the powertrain are reduced to a minimum.
- **Level 1:** This is the default setting, at which recuperation is noticeable for the driver. It corresponds approximately to the deceleration of a conventional combustion engine with the clutch engaged.
- **Level 2:** Stronger recuperation, the brake pedal hardly needs to be used when driving in traffic.
- **Level 3:** Highest energy recovery, allowing for "one-pedal" driving much like in an all-electric vehicle. Depending on the driving situation, over 90 kW of power can be fed back into the battery.

Operating strategy: electric power always available

The basic operating strategy is derived from the hybrid powerpack of the Mercedes-AMG Petronas Formula 1 race car. As in the top class of motorsport, maximum propulsion is always available when the driver calls it up by kick-down – to accelerate powerfully out of corners or to overtake quickly. The electric power can always be called on and frequently reproduced via high recuperation performance and needs-based recharging. The car's specific battery concept allows the optimal compromise between maximum driving dynamics and contemporary efficiency. All components are intelligently coordinated with each other: the performance gain can be experienced directly.

Seven AMG driving modes

The seven AMG DYNAMIC SELECT driving modes, "Electric," "Comfort," "Battery Hold," "Sport," "Sport+," "Slippery" and "Individual," are precisely tailored to the new drive technology, offering a wide range of driving experiences – from efficient to dynamic. The driving modes adjust important parameters including the response of the drive and transmission, steering characteristics, chassis damping and sound. The boost power of the electric motor also depends on the respective driving mode. It can be selected via the central multimedia display or the AMG steering wheel buttons. In all modes, the peak power of the electric motor can be easily called up via the accelerator pedal. The haptic accelerator pedal provides a tangible pressure point that the driver's foot must overcome.

As standard, the performance hybrid starts silently in the "Electric" driving mode when the electric motor is switched on. In the instrument cluster, the "Ready" icon signals that the vehicle is ready to drive. In addition, a powerful, sonorous start-up sound, characteristic of AMG, is emitted in the interior via the vehicle's loudspeakers as acoustic feedback, showing readiness to get going. Slight pressure on the accelerator pedal is all it takes to set the AMG Performance hybrid in motion.

- **"Electric":** The focus is on the electric driving experience. All-electric driving is possible from a standstill up to 87 mph, while the combustion engine remains switched off. The mechanical connection to the AMG Performance 4MATIC+ components means that all-wheel drive is always available. If the rear wheels lose grip, the power of the electric motor is also transmitted to the front wheels via the driveshaft and axles. If the battery runs down or the driver requests more power, the intelligent operating control automatically switches to the "Comfort" driving mode and the combustion engine starts up and almost imperceptibly takes over the drive power.
- **"Comfort":** Starting off takes place mostly in electric mode. The combustion engine and electric motor then run as the situation demands – with electric drive at low speeds, for example during city driving. During highway driving the vehicle operates as a hybrid. Overall, the result is a harmonious and efficiency-optimized driving experience, thanks in part to the early upshifts of the AMG SPEEDSHIFT® MCT 9G transmission. Suspension and steering are set up for an emphasis on comfort. The focus of the control system is on energy efficiency, which reduces fuel consumption and emissions. The hallmark AMG sportiness and agility are retained.
- **"Battery Hold":** The combustion engine and electric motor run situationally, as in the "Comfort" driving mode. The biggest difference is the operating strategy keeps the battery state of charge constant. For

example, if the battery is at 75 percent charge, it remains in this range in "Battery Hold." Use of the electric motor is then limited and optimized for low power consumption, which is compensated for by recuperation. Drivers can decide when to make full use of the battery charge again simply by changing the driving mode.

- **"Sport"**: Start-off with combustion engine and electric motor and permanent interaction of the two drives. More boost from the electric motor is enabled. More agile accelerator response, shorter shift times, earlier downshifts, along with a more dynamic suspension and steering setup provide a sporty driving experience.
- **"Sport+"**: Start-off with combustion engine and electric motor and permanent interaction of the two drives. Even higher boost performance. Extremely sporty character thanks to even more agile throttle response and targeted torque intervention during upshifts, with cylinder deactivation for optimum shift times. Increased idle speed for faster starting. An even more dynamic setup for suspension, steering and powertrain.
- **"Slippery"**: Optimally tuned for slippery road conditions, with reduced power input and boost, as well as a flat torque curve. Electric-only driving and recuperation adjustment are deactivated.
- **"Individual"**: Individual customization of the drive, transmission, AMG DYNAMICS, suspension, steering and exhaust system.

Dynamic control combines agility with stability

The integrated AMG DYNAMICS dynamic control system is also part of the standard specification. It influences the control strategies of ESP® (Electronic Stability Program), the all-wheel drive system, and the electronically controlled limited-slip rear differential. This increases agility without compromising the vehicle's stability. AMG DYNAMICS determines how the vehicle should react. The system uses the available sensors, among other things, to ascertain speed, lateral acceleration, steering angle and yaw rate. By means of intelligent pre-control, the vehicle behavior can be predicted from the actions of the driver and data from the sensors. Regulation is tailored to the dynamic driving skill of the driver – without any noticeable or disruptive interventions by the system. The result is an authentic driving experience with high cornering dynamics and optimum traction with high stability and predictable handling.

- **"Basic"** is assigned to the driving modes "Comfort" and "Electric." The design results in a very stable ride with high yaw damping.
- **"Advanced"** is activated in "Sport" mode. The vehicle remains neutrally balanced. The reduced yaw damping and increased agility support dynamic maneuvers such as cornering at speed.
- **"Pro"** is part of the "Sport+" mode. In "Pro," the driver receives even more assistance for dynamic driving maneuvers, while agility and feedback from the road when cornering are further enhanced.

In the "Individual" driving mode, the driver can personally set the AMG DYNAMICS levels "Basic," "Advanced" and "Pro."

Interior sound experience during electric driving

When driving on all-electric power, the Acoustic Vehicle Alerting System informs others the performance hybrid is approaching. A specially composed, low-frequency and speed-modulated AMG sound is emitted to the outside via loudspeakers. The sound can also be heard at a subdued level in the interior, as acoustic feedback for the passengers. The system is active at speeds up to approximately 19 mph. Afterwards, the electric drive signal fades out harmoniously. The electric driving sound can also be experienced at higher speeds by selecting the sound via the corresponding button on the steering wheel (identifiable by the frequency wave symbol).

Confident powerpack: Handcrafted AMG 4.0L V8 biturbo engine

A central component of the P3 hybrid powertrain is the Handcrafted AMG 4.0L V8 biturbo engine, producing 603 hp. It provides maximum torque of 664 lb-ft, which is available over a broad rpm range. The engine's most important design features include two twin-scroll turbochargers, which are located in the hot inner-V.

The position between the two cylinder banks shortens the paths of the exhaust gases to the turbocharger and the compressed fresh air to the combustion chamber. The result is an immediate response. Another important feature is the belt-driven starter-generator (RSG), which is integrated into the 400-volt electrical system. This combines the starter and alternator into one unit, and has sufficient power to always start the V8 in an instant.

Active engine mounts for the first time in the S-Class

The S 63 E PERFORMANCE is the only model in the segment to be equipped with active engine mounts. The bearings resolve the conflict between soft connection of the powertrain for high comfort and hard connection for optimal driving dynamics and can infinitely adjust its stiffness to the current driving conditions. The vehicle sensors detect the respective driving situation as well as the resulting vibration behavior of the engine and pass this information on to a control unit. This controls the force with which the engine is coupled to the body. The biggest advantage is the further increased spread between performance and comfort.

Short shift times, high efficiency: the AMG SPEEDSHIFT® MCT 9G transmission

In the AMG SPEEDSHIFT® MCT 9G transmission (MCT = Multi-Clutch Transmission), a wet starting clutch replaces the torque converter. It reduces weight and, thanks to its lower inertia, optimizes response to accelerator pedal input, especially during quick acceleration and load changes. The elaborately tuned software ensures short gearshift times as well as fast multiple downshifts if required. It delivers a particularly emotive gearshift experience thanks to the double-declutching function in the "Sport" and "Sport+" driving modes. Defined ignition interventions allow the gear to be changed even faster than in the other modes. In all drive programs, starting off occurs in first gear in order to always guarantee a dynamic driving experience. There is also the RACE START function, which ensures optimal acceleration from a standstill. In manual mode "M," the transmission responds immediately and precisely to manual gearshift commands from the driver.

AMG Performance 4MATIC+ variable all-wheel drive

AMG Performance 4MATIC+ all-wheel drive combines the advantages of different drive concepts. The variable torque distribution to the front and rear axles ensures optimum traction at the physical limit. Drivers can rely on high driving stability and safety in all conditions. The transition from rear-wheel to all-wheel drive and vice versa takes place continuously on the basis of a sophisticated matrix that integrates the intelligent control into the entire vehicle systems architecture.

An electromechanically controlled clutch connects the permanently driven rear axle variably to the front axle. The best possible torque split is continuously computed according to the driving conditions and driver's input. Alongside traction and lateral dynamics, the all-wheel drive also improves the longitudinal dynamics for even more powerful acceleration.

High torsional rigidity: extensively reinforced bodyshell

The basis for the high driving dynamics and outstanding comfort is the bodyshell of the AMG S-Class. At the front, there is an aluminum stabilizer under the V8 biturbo engine which increases the torsional stiffness of the front end and, thus, improves feedback to the driver, especially when turning into a corner. A cross-brace at the suspension mounting points also stiffens the bodyshell structure.

At the rear, there are diagonal struts made of strong, lightweight aluminum in the underbody to noticeably increase driving precision. A specific load compartment recess made of lightweight fiber-reinforced plastic (FRP) accommodates the AMG high-performance battery and also increases the rigidity of the bodyshell in this area.

AMG RIDE CONTROL+ suspension with adaptive damping as standard

The AMG RIDE CONTROL+ suspension is based on air suspension with automatic level control, combined with adaptive adjustable damping. The air suspension struts adapt to the driving situation, allowing a softer or

firmer setup. Another feature is the level control system, which automatically lowers the S-Class by 0.4 inches above 75 mph.

With the help of two continuously variable control valves, the damping force can be adjusted very precisely to different driving conditions and driving modes. One valve controls the rebound damping, i.e. the force that occurs when the wheel rebounds, and the other controls the compression damping when the wheel compresses. The rebound and compression phases are controlled independently of each other. The AMG development team was able to significantly increase the spread between sportiness and comfort by widening the gap between the minimum and maximum damping force characteristics and by providing even greater characteristic mapping flexibility. Thanks to the special design of the valves, the damper reacts quickly and sensitively to changing road surfaces and driving conditions.

The driver can preselect the basic setup via the AMG DYNAMIC SELECT driving modes. At the touch of a button, the handling characteristics change – from full dynamics in "Sport+" mode to smooth cruising in the "Comfort" setting. In addition, the tuning can be adjusted independently of the driving modes in three stages ("Comfort," "Sport" and "Sport+") via a dedicated button. The system's control software continuously monitors operating data such as steering wheel angle, vehicle speed, acceleration and body movement. In this way, the dampers are controlled within milliseconds as the situation requires. The result is that, even during extreme driving maneuvers or on rough roads, the wheels are always firmly on the ground.

Active roll stabilization as standard

Another feature makes a decisive contribution to the AMG-specific setup for high driving dynamics – AMG ACTIVE RIDE CONTROL active roll stabilization. Instead of using conventional, rigid anti-roll bars, the system compensates body movements electromechanically. For this purpose, the anti-roll bars on the front and rear axles are divided into two parts. In the center is an electromechanical actuator in which a three-stage planetary gear is integrated. When the road surface is uneven or the driving style is moderate, the actuator actively separates the stabilizer halves, which increases driving comfort. During dynamic driving the halves join together and are twisted against each other.

Moreover, the system not only reduces rolling movements when cornering, but also allows more precise tuning of the steering and load cycle behavior. In addition, it increases ride comfort when driving in a straight line as one-sided road imperfections are balanced out. Movements in the body can be actively and optimally adjusted to the driving conditions. This allows the driver to experience the AMG driving characteristics in terms of dynamics, precision and feedback even more intensively.

To meet the high power requirements, the system is based on an additional 48-volt onboard sub-network. Another benefit compared to conventional hydraulic-based systems is the significantly faster response. The AMG control system can adjust the vehicle status up to 500 times per second. Added to this is the lower weight of the components compared to hydraulic solutions.

Performance hybrid drive can control the traction of one wheel instead of ESP

The control of vehicle dynamics also benefits from the hybrid drive. Instead of intervention by ESP®, the electric motor can also control traction as soon as a wheel loses grip. To accomplish this, the intelligent control system reduces the drive torque of the electric motor that is transferred to the wheel via the limited-slip rear differential. The result is that ESP® does not have to throttle the combustion engine, enabling the engine to be operated at a higher torque. This subsequently improves agility, and the otherwise reduced power can be used to charge the battery.

Three-stage AMG parameter steering and standard rear-axle steering

The steering layout also contributes to the increase in dynamics and comfort. The three-stage AMG parameter steering system features a variable steering geometry ratio that adapts to the selected driving mode. At high

speeds, the steering power assistance decreases, while at low speeds it is steadily increased. As a result, only a comparatively small amount of force is required when maneuvering low speeds. When driving at higher speeds, the best possible control of the vehicle is maintained. In the "Sport" and "Sport+" suspension settings, the steering wheel also provides significantly more feedback to the driver.

The standard rear-axle steering operates with a maximum steering angle of 2.5 degrees. Up to this point, the rear wheels turn in the opposite direction to the front wheels at speeds of up to 62 mph (variable depending on the AMG DYNAMICS setting). This leads to a virtual shortening of the wheelbase and results in significantly more agile turn-in, less steering effort and increased maneuverability. This noticeably reduces the turning circle when turning or parking. At speeds above 62 mph (variable depending on the AMG DYNAMICS setting), the rear wheels turn in parallel with the front wheels. The virtual extension of the wheelbase has a positive effect on driving stability. It builds up lateral force more quickly when changing direction, allowing the vehicle to respond more directly to steering commands. The response of the rear-axle steering depends on the selected AMG DYNAMIC SELECT driving mode.

The interplay of active roll stabilization and active rear-axle steering helps to spread the driving behavior even further. On the one hand, the AMG S-Class is a comfortable luxury sedan with absolutely stable handling at high speed. On the other, the driver can call up sporty characteristics with agile light-footedness and maneuverability at the touch of a button.

AMG high-performance compound brake system

In keeping with the extreme power and associated performance, the AMG high-performance composite braking system with 6-piston fixed calipers at the front and 1-piston floating calipers at the rear is fitted standard. The brake discs measure 15.7 x 1.5 inches (400 x 38 mm) at the front axle and 15 x 1.3 inches (380 x 32 mm) at the rear axle. The brake system impresses with short braking distances as well as maximum stability and fade-resistance under heavy use. In addition, it provides a long service life and a particularly fast response. Comfort features include Hill Start Assist and priming/dry braking in wet conditions. With the ignition switched off and the vehicle at a standstill, the transmission automatically selects the parking position "P." Meanwhile, the electric parking brake releases automatically when pulling away. The AMG ceramic high-performance composite brake system is available as an option. The lightweight brake material saves weight and reduces unsprung mass.

More comfortable and safe driving with numerous assistance systems

Numerous new or enhanced driver assistance systems support the driver by providing situation-specific assistance with speed adaptation, distance control, steering and lane changes. The new assistance display in the driver display clearly shows the operating principle of the driving assistance systems as a full-screen view. Drivers recognize their car, lanes, lane markings and other road vehicles in an abstracted view. The system status and operation of the assistants are visualized in this depiction of the surroundings. The new, animated assistance display is based on a 3D scene generated in real time. This dynamic, high-quality representation makes the operation of the driver assistance systems transparent as an augmented reality driving experience.

The most important new features of the driver assistance systems in the Mercedes-AMG S-Class

Active Distance Assist DISTRONIC

This intelligent system can automatically maintain a preset distance from vehicles ahead on all types of roads.

- New features include collision-avoidance reaction to stationary road users up to a maximum of 62 mph (previously 37 mph), as well as the selection of the dynamics of DISTRONIC in MBUX, independently of DYNAMIC SELECT.

Active Steering Assist

This helps drivers to follow their lane at speeds up to 130 mph.

- New features include additional lane detection with 360° camera, significantly increased availability and cornering performance on rural roads, increased lane centering on highways and situation-specific off-lane driving.

Traffic Sign Assist

In addition to conventionally signposted speed limits, this recognizes overhead and roadwork speed limit signage.

- New features are the stop sign warning function – warning of running a stop sign – and the red traffic light warning function – warning of running a red traffic light.

Active Lane Keeping Assist

From 37 to 155 mph, Active Lane Keeping Assist uses a camera to detect when lanes markings or edges of roads are crossed, helping the driver to avoid leaving the lane unintentionally. The system also intervenes if there is a danger of collision with detected vehicles in the adjacent lane.

- New features include the reaction to road edges, e.g. a grass verge, the particularly intuitive intervention via the steering, the setting of sensitivity via a menu (Early, Medium, Late) and the addition of the hazard display with the aid of Active Ambient Lighting and the Augmented Reality Head-up Display.

Active Lane Change Assist

Active Lane Change Assist cooperatively assists the driver of the new S-Class when moving to an adjacent lane. A lane change to the right or left is only assisted if the sensors detect that the adjacent lane is separated from the present lane by broken lane markings, and no other vehicles are detected in the relevant danger zone.

- New features are the longer search phase (15 seconds instead of 10 seconds, depending on the market) in which the lane change can take place, and the higher lateral dynamics (depending on the market).

Active Emergency Stop Assist

Active Emergency Stop Assist brakes the vehicle to a standstill in its own lane if it recognizes the driver is no longer responding to the traffic situation for a longer period. This works in the new Mercedes-AMG S-Class even if Active Distance Assist DISTRONIC with Steering Assist is not switched on.

- Other innovations include seat belt pre-tensioning and a short, strong brake jolt as final prompts before brake application, and optional lane change by one lane (at 50 mph, no obstacles in neighboring lane).

ATTENTION ASSIST

The standard system can detect typical signs of driver fatigue and severe inattention, and prompts them with a warning message to take a break.

- The additional micro-sleep warning is a new feature. It includes analysis of the driver's eyelid movements by a camera in the driver's display (only in conjunction with certain optional extras). The micro-sleep warning function is active from a speed of 12 mph.

Active Brake Assist with cross-traffic function

Active Brake Assist uses the on-board sensors to register whether there is a risk of collision with vehicles travelling ahead, crossing or oncoming. In the event of an imminent collision, the system can warn drivers visually and acoustically. If braking is too weak, it is also possible to support drivers by increasing the braking torque according to the situation and to initiate autonomous emergency braking if there is no reaction from the driver.

- New functions include the turn-off function (e.g. crossing pedestrians when turning off), extension of the cross-traffic function to long-distance routes (up to 75 mph instead of 45 mph) and warning/braking for oncoming traffic.

Active Blind Spot Assist and exit warning function

Active Blind Spot Assist can give a visual warning – and if the indicators are operated also an acoustic warning – of potential lateral collisions in a speed range from approximately 6 to 124 mph. If the driver ignores the warnings and initiates a lane change, the system can intervene at the last moment at speeds above 19 mph by braking on one side as corrective action. When the vehicle is stationary, the exit warning function can warn against exiting because another vehicle (or even a bicycle) is passing within the critical area. This function is available when the vehicle is stationary and for up to 3 minutes after the ignition has been switched off.

- New features include the addition of Active Ambient Lighting to the hazard display (also for the exit warning). Thanks to the cameras of the MBUX Interior Assistant, a hazard warning can even be given when the vehicle occupants merely move a hand towards the door handle.

Evasive Steering Assist

Evasive Steering Assist can support drivers when they want to avoid a road user detected by the system in a dangerous situation.

- In the new S-Class, the system not only recognizes stationary and crossing pedestrians, but now also takes account of pedestrians and vehicles travelling longitudinally, as well as cyclists. The speed range has been increased to 67 mph (instead of 45 mph), and assistance is also given on long-distance routes.

Technical data

Mercedes-AMG S 63 E PERFORMANCE

Hybrid system		
Layout		P3: combustion engine at the front, electric motor at the rear axle
Combined system output	hp	791
Combined system torque ¹	lb-ft	1,055
Battery capacity	kWh	13.1 (10.36 usable)
Electric range	mi	16
Combustion engine		
Number of cylinders/arrangement		8/V
Displacement	cc	3,982
Engine output	hp	603
at engine speed	rpm	5,500-6,500
Engine torque	lb-ft	664
at engine speed	rpm	2,500-4,500
Compression ratio	:1	8.6
Mixture formation		Direct gasoline injection, two turbochargers
Electric motor		
Type		Permanently excited synchronous motor
Electric motor output	hp	188
Electric motor torque	lb-ft	236
Drivetrain		
Drive system		AMG Performance 4MATIC+ fully variable all-wheel drive
Transmission		AMG SPEEDSHIFT® MCT 9G (automatic transmission with wet multi-disc start-off clutch)
Gear ratios		
1st/2nd/3rd/4th/5th/6th/7th/ 8th/9th gear	:1	5.35/3.24/2.25/1.64/1.21/1.00/0.87/0.72/0.60
Reverse	:1	4.80
Suspension		
Front axle	AMG RIDE CONTROL+ air suspension with adaptive adjustable damping and AMG ACTIVE CONTROL active roll stabilization	
Rear axle	AMG RIDE CONTROL+ air suspension with adaptive adjustable damping, AMG ACTIVE CONTROL active roll stabilization and active rear-axle steering	
Brake system	AMG high-performance composite braking system, front 15.7 x 1.5-in (400 x 38 mm) internally ventilated and perforated brake discs, 6-piston aluminum fixed caliper; rear 15 x 1.3-in (380 x 32 mm) internally ventilated and perforated brake discs, 1-piston aluminum floating caliper; electric parking brake, ABS, Brake Assist, 3-stage ESP®	
Steering	Electromechanical speed-sensitive power steering with rack and pinion system, variable steering ratio (13.6:1 at dead center) and variable power assistance	
Standard wheel size	front: 9.5 x 20 in rear: 10.5 x 20 in	
Standard tire size	front: 255/45 R20 rear: 285/40 R20	
Dimensions		
Wheelbase	in	126.6
Front / rear track	in	65.8 / 64.6
Length / width / height	in	210.1 / 75.6 without mirrors (83 with mirrors) / 59.6
Turning circle	ft	40.6 (wall-to-wall)
Curb weight	lbs	5,831
Cargo capacity	cu ft	10.7
Fuel tank capacity	gal	20.1

Performance		
Acceleration 0-60 mph	s	3.3 (est.)
Top speed	mph	155 / 180 mph with optional top speed delimiter (electronically limited)

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About Mercedes-Benz USA

Mercedes-Benz USA (MBUSA), headquartered in Atlanta, is responsible for the distribution, marketing and customer service for all Mercedes-Benz products in the United States. MBUSA offers drivers the most diverse lineup in the luxury segment with 18 model lines ranging from the sporty GLA SUV to the flagship S-Class and the dynamic all-electric vehicles from Mercedes-Benz. MBUSA is also responsible for Mercedes-Benz Vans in the U.S. More information on MBUSA and its products can be found at www.mbusa.com and www.mbvans.com.

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¹ The combined system torque specified is a calculated theoretical value that is used for comparison purposes.