Press Information
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The Mercedes-AMG GT 63 S E PERFORMANCE 4-Door Coupe

The most powerful production vehicle from Affalterbach

Affalterbach. The Mercedes-AMG GT 63 S E PERFORMANCE 4-Door Coupe combines exceptional performance and impressive driving dynamics thanks to its special performance hybrid powertrain. The combination of a Handcrafted AMG 4.0L V8 biturbo engine and electric motor generates a combined system output of 831 hp and a combined system torque of 1,032 lb-ft[1]. The immediate response of the electric drive at the rear axle, rapid torque build-up and improved weight distribution make for a new, highly dynamic driving experience.

E PERFORMANCE: Combustion engine at the front, electric motor at the rear

In the AMG GT 63 S E PERFORMANCE, the Handcrafted AMG 4.0L V8 biturbo engine is combined with a permanently excited synchronous electric motor, an AMG high performance battery developed in Affalterbach and AMG Performance 4MATIC+ fully variable all-wheel drive. The Handcrafted AMG 4.0L V8 biturbo engine and electric motor generate a combined system output of 831 hp and a combined system torque of 1,032 lb-ft[1]. The driving performance of the most powerful series-production vehicle from Affalterbach to date is correspondingly impressive: acceleration from a standstill to 60 mph takes just 2.8 seconds and acceleration only ends at a 197 mph electronically limited top speed.

The 201 hp electric motor is positioned at the rear axle, where it is integrated with an electrically shifted two-speed gearbox and electronically controlled limited-slip rear differential in a compact electric drive unit (EDU). Experts refer to this layout as a P3 hybrid. The lightweight high-performance battery is also located above the rear axle. This compact design has numerous advantages:

- 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 is even more agile when accelerating out of corners with great agility.
- If wheel slip at the rear axle occurs, 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 and thus 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.

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

- The automated two-speed transmission at the rear axle with its specially calibrated gear ratio 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 approximately 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.

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

When defining the electrification strategy, it was clear from the outset that all essential components would be developed in Affalterbach. At the heart of this is the AMG high performance battery (HPB). The development of the lithium-ion battery was inspired by technologies proven under the toughest conditions 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 are the fast energy draw and high power density.

94 hp continuous output and 201 hp peak output

The high performance battery of the AMG GT 63 S E PERFORMANCE has a capacity of 6.1 kWh (4.8 kWh usable) to enable 94 hp of continuous output and 201 hp of peak output for ten seconds. The low weight of only 196 lbs. allows for a very high power density. External charging takes place via the 3.7 kW on-board AC charger, at a charging station, wallbox or household socket. The battery is designed for fast power delivery rather than longest possible range.

Innovative direct cooling of 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 4 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.

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 - for example, to accelerate powerfully out of corners or when overtaking. The electric power can always be called on and frequently reproduced via high recuperation performance and needs-based recharging. The independent battery concept also enables the optimal compromise between maximum driving dynamics and modern efficiency. All components are perfectly coordinated: the performance gain can be experienced directly.

AMG DYNAMIC SELECT Drive Programs

The AMG DYNAMIC SELECT drive programs, "Electric," "Comfort," "Battery Hold," "Sport," "Sport+," "RACE," "Slippery" and "Individual," are precisely tailored to the new drive technology, offering a wide range of driving experiences – from efficient to dynamic. The drive programs 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 drive program. It can be selected via the central multimedia display or the AMG steering wheel buttons. In all drive programs, 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" drive program 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" drive program 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" drive program. 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 drive program.
- "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.
- **"RACE":** For highly dynamic driving on closed courses and racetracks. All parameters are configured for maximum performance, starting with combustion engine and electric motor and situational interaction of the two drives. Full electric boost power from the electric motor to support the combustion engine during hard acceleration. Strong battery recharging at low power demand for maximum energy availability.
- **"Slippery":** Optimized for slippery road conditions, with reduced power and a flat torque curve. All-electric driving and recuperation adjustment are deactivated.
- **"Individual":** Individual customization of the drive, transmission, AMG DYNAMICS, chassis, steering and exhaust system.

The control of vehicle dynamics also benefits from the hybrid drive. Instead of braking intervention by ESP®(Electronic Stability Program), the electric motor can also control traction as soon as a wheel signals too much slip. 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. As a result, ESP® does not have to throttle the combustion engine, enabling the engine to be operated at higher torque. This improves agility and the otherwise reduced power can be used to charge the battery.

Integrated AMG DYNAMICS

The integrated AMG DYNAMICS vehicle dynamics control system is also included standard. It influences the control strategies of ESP®, the all-wheel drive system and 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 the speed, lateral acceleration, steering angle and yaw rate. Thanks to an 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 "Comfort" and "Electric" drive programs. The design results in a very stable ride with high yaw damping.
- **"Advanced"** is activated in the "Sport" drive program. 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+" drive program. In "Pro" the driver receives even more assistance for dynamic driving maneuvers while agility and feedback from the road when cornering are further enhanced.
- **"Master"** is coupled with the "RACE" drive program and is designed for use on closed courses and racetracks. "Master" offers a slightly oversteering vehicle balance, more direct steering and more agile turn-in. To activate "Master" mode, the driver must use the separate button in the center console to switch ESP® to ESP® SPORT handling mode or ESP® OFF.

In the "Individual" drive program, drivers can select the "Basic," "Advanced," "Pro" or "Master" AMG DYNAMICS calibration.

Recuperation 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 recuperation 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. 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 drive programs and the energy recovery is then configured differently depending on the selected drive program.

- Level 0: The vehicle behaves similarly 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 pushed 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 100 kW of power can be fed back into the battery.
- Special feature of the RACE drive program: On the racetrack, the driver wants to squeeze the maximum time possible out of any braking action. In "RACE" drive program, recuperation is automatically set at level 1 to allow the most predictable vehicle behavior possible at the limits.

Sound experience for all-electric driving

When driving on all-electric power, the acoustic vehicle alert system informs others the AMG GT 63 S E PERFORMANCE is approaching. A specially composed low-frequency, speed-dependent AMG sound is emitted to the outside via speakers at the front and rear. The sound can also be heard at a subdued level in the interior, as acoustic feedback. The system is active at speeds up to approximately 18 mph. Above this speed, the sound fades out harmoniously.

Drivers can experience the electric driving sound at higher speed ranges by selecting the sound via the corresponding AMG DRIVE UNIT button on the steering wheel (identifiable by the frequency wave symbol). When driving on all-electric power, either a discreet or a powerful sound experience is generated. When the combustion engine starts, the selected setting influences the sound of the exhaust system. In every situation, one thing remains the same: the performance hybrid is immediately recognizable as an AMG by its sound.

Handcrafted AMG 4.0L V8 biturbo engine with twin-scroll turbochargers

The AMG GT 63 S E PERFORMANCE benefits from the performance of the Handcrafted AMG 4.0L V8 biturbo engine with 630 hp and 664 lb-ft of torque, which is available from 2,500 to 4,500 rpm.

Two twin-scroll turbochargers contribute to high power output, combining optimum response at lower engine speeds with an increase in power at higher engine speeds. In addition, the turbine housing is divided into two flow passages which run parallel to one another. Combined with two separate ducts in the exhaust manifold, this makes it possible to individually control the momentum of the exhaust gases acting on the turbine wheel. One duct is fed by the exhaust gases of the first and second cylinders of a cylinder bank, the other by the exhaust gases of the third and fourth cylinders. The aim is to prevent the individual cylinders from having mutually adverse effects on the gas cycle. This reduces the exhaust gas back-pressure and improves the gas exchange.

A belt-driven starter-generator (RSG) combines the alternator and starter in one unit. It is integrated into the 400-volt electrical system and has sufficient power to start the V8 engine in an instant.

Exterior design

The expressive design with a low front section, muscular body, sleek greenhouse and dynamic fastback reflects the dynamic character of the 4-door coupe. At the rear of the vehicle, the AMG GT 63 S E

PERFORMANCE features unique visual accents including a rear bumper with integrated charging port door, “GT 63 S” model badge highlighted in red and grooved trapezoidal twin tailpipe trims. The “E PERFORMANCE” badge on each front fender also indicates the performance hybrid drive.

MBUX multimedia system with hybrid-specific displays

The MBUX infotainment system (Mercedes-Benz User Experience) includes many AMG hybrid-specific displays and functions. High-quality graphics visualize the power flow of the drive system. Speed, power, torque and temperature of the electric drive unit can also be displayed.

AMG Performance steering wheel

The standard AMG Performance steering wheel with its distinctive twin-spoke design and seamlessly integrated control buttons also contributes to the hallmark AMG look. The three rounded twin spokes combine strength with lightness. The round AMG steering wheel buttons impress with brilliant displays and intuitive operating logic. This allows important driving functions and all drive programs 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.

Standard AMG RIDE CONTROL+ suspension

The AMG RIDE CONTROL+ suspension is based on multi-chamber air suspension with automatic level control, combined with adaptive, electronically controlled adjustable damping. This damping system utilizes two pressure relief valves. These continuously variable control valves, located outside the damper, allow the damping force to be adjusted even more precisely to different driving conditions and drive programs. 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 stages are controlled independently of each other.

The AMG development engineers were able to significantly increase the differentiation between sportiness and comfort, among other things by widening the gap between the minimum and maximum damping force characteristics and by providing even greater flexibility in map design. Due 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 drive programs. At the touch of a button, the handling characteristics change, for example, from full dynamics in "Sport+" to smooth cruising in the "Comfort" setting. In addition, the tuning can be adjusted in three stages independently of the drive programs.

AMG high performance carbon ceramic composite brake system

An AMG high performance carbon ceramic composite brake system with bronze-colored six-piston fixed calipers at the front and single-piston floating calipers at the rear is fitted as standard. The carbon ceramic brake discs measure 16.5 x 1.6 inches at the front axle and 15 x 1.3 inches at the rear axle. The brake system impresses with short braking distances, high stability and fade-resistance.

Technical data at a glance

	Mercedes-AMG GT 63 S E PERFORMANCE 4-Door Coupe
Engine	Handcrafted AMG 4.0L V8 biturbo with direct injection
Displacement	3,982 cc
Combined system output	**831 hp**
Combined system torque[2]	**1,032 lb-ft**
Engine output	630 hp at 5,500–6,500 rpm
Engine torque	664 lb-ft at 2,500–4,500 rpm
Electric motor output	201 hp
Electric motor torque	236 lb-ft
Drive config.	AMG Performance 4MATIC+ fully variable all-wheel drive
Transmission	AMG SPEEDSHIFT® MCT 9G
Battery capacity	6.1 kWh (4.8 kWh usable)
0-60 mph	2.8 s (est.)
Top speed	197 mph (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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2 The combined system torque specified is a calculated theoretical value that is used for comparison purposes.