



Press Information

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The new Mercedes-AMG C 43 Sedan: more power, greater efficiency

Innovative drive technology with electric exhaust-gas turbocharger for a highly agile driving experience

Affalterbach. With technology derived directly from Formula 1™, the latest generation of the Mercedes-AMG C 43 Sedan sets new standards for innovative drive solutions. Following its global premiere in the Mercedes-AMG SL 43, the AMG M139l hand-built engine, the world's first series-production unit to feature an electric exhaust-gas turbocharger, is now also being used in the new AMG C 43 Sedan. Developed exclusively at Mercedes-AMG, the advanced unit is produced under the company's "One Man, One Engine" principle. The new form of turbocharging guarantees a spontaneous response across the entire rev range and thus offers an even more dynamic driving experience. The turbocharger is operated via the 48-volt electrical system, which also feeds the belt-driven starter-generator (RSG). In the AMG C 43 Sedan the unit produces 402 hp and, in certain driving situations, is able to receive a brief additional boost of 13 hp from the electric motor. The standard rear-axle steering, AMG Performance 4MATIC permanent all-wheel drive with rear-biased torque distribution, AMG SPEEDSHIFT® MCT 9G transmission with wet start-off clutch and AMG RIDE CONTROL suspension with Adaptive Damping System also contribute to the dynamic powertrain. The 2023 AMG C 43 Sedan impressively leads its segment in both power and efficiency.

"The C-Class has always been an absolute success story for Mercedes-AMG. With the innovative technology of the electric exhaust-gas turbocharger, we are once again significantly increasing the attractiveness of this latest generation. The new turbocharging system and the 48-volt on-board electrical system not only contribute to the outstanding driving dynamics of the C 43, but also improve its efficiency. In this way, we are demonstrating the tremendous potential that lies in electrified combustion engines. The standard all-wheel drive, the active rear-axle steering and the quick-shifting transmission all serve to enhance the Driving Performance that is the hallmark of AMG," says Philipp Schiemer, Chairman of the Board of Management of Mercedes-AMG GmbH.

At the heart of the new AMG C 43 is the AMG 2.0-liter four-cylinder engine, which combines innovative technologies and high performance with exemplary efficiency. At the same time, it remains true to a tradition typical of the brand: not only was it developed entirely at the company's site in Affalterbach, but it is also manufactured there in accordance with the principle of "One Man, One Engine." In this process, Mercedes-AMG combines the craftsmanship of its highly qualified employees with the latest production methods of Industry 4.0 and a high degree of digitalization.

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The internally named M139l engine (l for longitudinal installation) is the world's first series-production engine to be turbocharged with an electric exhaust-gas turbocharger. The innovative system is a direct derivative of the technology that the Mercedes-AMG Petronas F1 Team has been using so successfully in the premiere class of motorsport for many years. The new form of turbocharging guarantees a particularly spontaneous response across the entire rev range. This leads to an even more performance-oriented driving experience, while also increasing efficiency.

The functional principle of the electric exhaust-gas turbocharger in detail

An electric motor around 1.6 inches thin is integrated directly on the turbocharger shaft between the turbine wheel on the exhaust side and the compressor wheel on the intake side. Electronically controlled, this drives the shaft of the turbocharger directly and thus accelerates the compressor wheel, before the exhaust gas flow takes over the drive in a conventional manner.

This significantly improves the response directly from idle and across the entire rev range. The combustion engine reacts even more spontaneously to accelerator-pedal input, while the entire driving feel is significantly more responsive. In addition, the electrification of the turbocharger enables higher torque at low revs. This also increases agility and optimizes acceleration from a standstill. Even when the driver takes their foot off the accelerator or brakes, the technology is able to maintain boost pressure at all times to ensure a continuously direct response.

Powered by the 48-volt on-board electrical system, the electric exhaust-gas turbocharger operates at speeds of up to 175,000 rpm, which enables a very high air-flow rate. The turbocharger, electric motor and power electronics are connected to the combustion engine's cooling circuit to create an optimal temperature environment at all times.

The closed-deck design of the M139 - adopted from the world of motorsport - ensures maximum rigidity in conjunction with low weight and allows peak combustion pressures of up to 2,300 psi. The areas around the cylinders are mostly solid, and the cover plate is penetrated only by smaller ducts for the coolant and engine oil. Friction is reduced between the pistons and cylinders with a coated lining utilizing NANOSLIDE technology. This gives the linings a mirror-like surface which is twice as hard as conventional grey cast-iron liners, increasing durability. This coating made its debut in the AMG M156 V8 engine, and has been used to refine other AMG engines for many years. It can also be found in the Formula 1™ engine utilized by the Mercedes-AMG Petronas Formula 1 Team.

Another outstanding feature is the two-stage gasoline injection. In the first stage, particularly fast and precise piezo injectors deliver the fuel into the combustion chambers at pressures of up to 2,900 psi. The second stage adds intake manifold duct injection with solenoid valves, which is needed to achieve the engine's high power output.

The high output also necessitates a sophisticated cooling system that can cool the cylinder head and crankcase to different temperature levels. This measure makes it possible to maintain a cold cylinder head for maximum power with efficient ignition timing, along with a warm crankcase to reduce internal engine friction. The cylinder head is cooled by a mechanical high-performance water pump, and the crankcase is cooled by a second, electrically driven water pump. After a cold start, this pump remains passive until the engine has warmed up. In operation it is regulated by the engine control unit so that the crankcase is always cooled according to need.

402 hp and 369 lb-ft enable sporty driving performance

In the AMG M139l engine, innovative technology helps the Mercedes-AMG C 43 to achieve a rated output of 402 hp at 6,750 rpm. The maximum torque of 369 lb-ft is available at 5,000 rpm. Depending on the situation, the system also briefly provides an additional boost of 13 hp through the belt-driven starter generator (RSG). The second-generation RSG acts as a mild hybrid, providing this temporary power boost. It also supports gliding and recuperation functions for maximum efficiency. At the same time, the 48-volt technology

increases comfort, as the transitions between the start-stop function and the gliding-mode function are almost imperceptible.

The AMG C 43 Sedan accelerates from a standstill to 60 mph in approximately 4.6 seconds. The top speed is electronically limited at 155 mph and by adding optional 19- or 20-inch wheels, it can be raised to 165 mph.

AMG SPEEDSHIFT MCT 9G transmission with wet start-off clutch and AMG Performance 4MATIC

Power is transmitted via the AMG SPEEDSHIFT MCT 9G transmission (MCT = Multi-Clutch Transmission), in which a wet start-off clutch replaces the torque converter. It reduces weight and, thanks to its lower inertia, optimizes response to accelerator pedal input, especially during spurts and load changes. The elaborately calibrated software ensures extremely short shift times as well as fast multiple downshifts as required. In addition, the intermediate throttle function in the "Sport" and "Sport+" driving modes delivers a particularly emotional gearshift experience. There is also a RACE START function, which ensures optimal acceleration from a standstill. The ECO start/stop function is automatically activated in the "Comfort" drive program; the "Glide" function can be activated in "Individual."

The AMG Performance 4MATIC permanent all-wheel drive features an AMG-specific torque distribution between the front and rear axles of 31 and 69 percent. The rear-biased configuration provides for enhanced handling, including higher lateral acceleration and improved traction when accelerating.

AMG DYNAMIC SELECT drive programs and AMG DYNAMICS control system

The five AMG DYNAMIC SELECT drive programs: "Slippery," "Comfort," "Sport," "Sport +" and "Individual" permit a wide range of vehicle characteristics, from comfortable to dynamic. The distinct driving modes offer an individual driving experience, precisely tailored to different driving conditions. In the "Sport" and "Sport+" programs, the engine's responsiveness, the transmission's shifting behavior, and the suspension and steering are tuned to be particularly agile.

The AMG C 43 also features the integrated "AMG DYNAMICS" driving dynamics control system as a component of the AMG DYNAMIC SELECT drive programs. This enhances the stabilizing functions of the Electronic Stability Program ESP® with interventions to add agility to the steering characteristics and additional ESP® functions. When cornering at speed, for example, brief braking intervention at the inner rear wheel generates a defined yawing moment around the vertical axis for responsive and precise turn-in.

The extent and effectiveness of these interventions depend on the AMG DYNAMIC SELECT program selected, whereby drivers using "Individual" mode can determine the settings for the AMG DYNAMICS levels "Basic," "Advanced" and "Pro" for themselves. The ESP® can be adjusted in three stages. "On" is the standard selection that offers high safety, adapted to the sporty character of the overall vehicle. "Sport," on the other hand, allows higher drift angles, while "Off" allows the system to be switched off completely for a particularly sporty driving style on closed-course race tracks.

AMG RIDE CONTROL suspension with Adaptive Damping System

The AMG RIDE CONTROL steel-spring suspension with Adaptive Damping System, which is standard on the AMG C 43, combines decidedly sporty driving dynamics with the long-distance driving comfort. The basis for this is provided by the front axle, with specially developed steering knuckles and suspension joints on the spring control arm, and by the rear axle, which also features elastokinematics designed for driving dynamics. Complementing this, the Adaptive Damping System continuously adapts the damping at each individual wheel to the current demand - always taking into account the preselected suspension level, the driving style and the condition of the road surface. In addition to an improvement in ride quality and comfort, this leads, above all, to an increase in driving safety. There is a choice of three different damping maps ("Comfort," "Sport" and "Sport+").

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

The steering layout of the AMG C 43 contributes to the improvement in both dynamics and comfort. The three-stage AMG parameter steering system, for example, features a variable steering geometry ratio that adapts to the selected drive program. At high speeds, the steering power assistance decreases; at low speeds it is steadily increased. As a result, comparatively little steering effort is required at low speeds, or when maneuvering and parking, while the best possible control over the vehicle is maintained when driving faster. In the "Sport" and "Sport+" suspension settings, the driver also experiences significantly more feedback about the driving condition via the steering wheel.

The new AMG C 43 brings rear-axle steering to the best-selling model series from Affalterbach as standard. It operates with a maximum steering angle of 2.5°. Up to this point, the rear wheels turn in the opposite direction to the front wheels at speeds of up to 37 mph (variable depending on the AMG DYNAMICS setting). This leads to a virtual shortening of the wheelbase, which in turn results in significantly more agile turn-in, less steering effort and improved maneuverability. For example, the turning circle is noticeably reduced when turning or parking. At speeds above 37 mph (variable depending on the AMG DYNAMICS setting), the rear wheels turn in parallel to the front wheels - up to a maximum of 0.7°. This virtual extension of the wheelbase has a positive effect on driving stability, leads to a faster build-up of lateral force when changing direction and thus to a more direct reaction of the vehicle to steering commands. The response of the rear-axle steering depends on the selected AMG DYNAMIC SELECT drive program.

AMG sport braking system and AMG exhaust system

The AMG sport braking system with silver-painted brake calipers and black "AMG" lettering guarantees outstanding deceleration values and optimum control. On the AMG C 43, internally ventilated and perforated brake discs measuring 370 x 36 millimeters with 4-piston fixed calipers are fitted at the front axle, and discs measuring 320 x 24 millimeters with 1-piston floating calipers at the rear.

The AMG exhaust system with its sporty engine sound provides the appropriate acoustic background. Depending on the drive program selected, the noise level ranges from balanced and discreet to sporty. The sound characteristics are controlled via an exhaust-gas flap, depending on engine speed and load. For the occupants, the listening pleasure can be further enhanced by the addition of the optional AMG Real Performance Sound. The actual engine sound is picked up by a sensor in the exhaust system and fed into the interior for a particularly emotive sound experience.

Characteristic AMG elements for the exterior and interior ensure a sporty, refined appearance

On the exterior, numerous AMG-specific details underscore both the dynamic and the luxurious character of the AMG C 43. In terms of exterior design, these include the AMG-specific radiator grille with vertical struts in chrome, AMG front bumper with air flaps, sporty air intakes and chrome-plated trim element, matching side sill panels, the diffuser-look rear bumper, and two round twin-tailpipe trim elements. The AMG C 43 is fitted with AMG light-alloy wheels and 18-inch tires as standard, with 19- and 20-inch options available.

In the interior, features such as AMG seats with a distinct upholstery layout and seat covers in black MB-Tex/Microfiber with red contrasting stitching and red seat belts provide a particularly sporty touch. The flat-bottom AMG Performance steering wheel in Nappa leather has a perforated grip area and silver-colored aluminum gearshift paddles. The two round AMG steering wheel buttons allow fast and unerring operation of various dynamic driving functions and AMG DYNAMIC SELECT drive programs. The dashboard and upper door trim are upholstered in leather with red topstitching. The sporty, luxurious atmosphere is rounded off by AMG sport pedals, AMG floor mats and illuminated door sills with AMG lettering.

The MBUX infotainment system features various AMG-specific displays and functions. These include special displays in the 12.3-inch digital instrument cluster, 11.9-inch LCD center touchscreen and optional Head-Up

Display. AMG TRACK PACE, the optional data logger for use on the race track, is also integrated. This software records more than 80 vehicle-specific data points such as speed, acceleration, steering angle and brake pedal actuation ten times per second while the car is driven on track. In addition, there is a display of lap and sector times as well as additional training and analysis tools.

Technical data

Mercedes-AMG C 43 Sedan

Engine		
Number of cylinders/arrangement		4/in-line
Displacement	cc	1,991
Rated output	hp	402 @ 6,750 rpm
Additional output (Boost)	hp	13
Rated torque	lb-ft	369 @ 5,000 rpm
Compression ratio		10:1
Mixture formation		combined direct gasoline injection and intake manifold injection, turbocharging by means of electrically assisted exhaust-gas turbocharger
Power transmission		
Drive configuration		All-wheel drive with rear-biased torque distribution (31:69 percent)
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		5.35/3.24/2.25/1.64/1.21/1.00/0.87/0.72/0.60
Reverse		4.80
Suspension		
Front axle	AMG RIDE CONTROL suspension with aluminum double wishbones, anti-squat and anti-dive control, lightweight coil springs and stabilizer bar as well as Adaptive Damping System	
Rear axle	AMG RIDE CONTROL suspension with aluminum double wishbones, anti-squat and anti-dive control, lightweight coil springs and stabilizer bar as well as Adaptive Damping System	
Braking system	Hydraulic dual-circuit brake system; 370 mm brake discs at front, internally ventilated and perforated, 4-piston aluminum fixed caliper; 320 mm brake discs at rear, internally ventilated and perforated, 1-piston aluminum floating caliper; electric parking brake, ABS, Brake Assist, 3-stage ESP®	
Steering	Electromechanical speed-sensitive power steering with rack and pinion, variable steering ratio (12.8:1 at dead center) and variable power assistance	
Wheels (standard)	front: 8.0 J x 18; rear: 8.0 J x 18	
Tires (standard)	front: 245/45 ZR 18; rear: 245/45 ZR 18	
Dimensions and weights		
Wheelbase	in	112.8
Front/rear track	in	62.6/63.1
Length/width/height	in	188.6/71.8/57.1
Turning circle	ft	39.3
Trunk capacity	cu-ft	16.1
Curb weight acc. to EC	lbs	3,893
Payload	lbs	1,135
Performance		
Acceleration 0-60 mph	sec.	4.6 (est.)
Top speed	mph	155 (electronically limited; 165 with opt. 19- or 20-in wheels)

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About Mercedes Benz

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 15 model lines ranging from the sporty GLA SUV to the flagship S-Class and the Mercedes-AMG GT Black Series. 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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