

The new BMW M3 Convertible. Contents.



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The new BMW M3 Convertible.

Description in Brief.



- Third body version of the new BMW M3; high-performance convertible from BMW M GmbH unique in its design and technical features; developed on the basis of the BMW 3 Series Convertible; consistent orientation to the high-performance character typical of BMW M, as with the BMW M3 Coupé and the BMW M3 Saloon. Car concept with a consistent, unique tradition: Fourth generation of both the BMW M3 Convertible and the BMW M3 Coupé.
- Unique combination of outstanding driving dynamics with aesthetic looks, unparalleled experience of open-air motoring and superior everyday driving qualities in that special combination specific to BMW M. Electrohydraulically operated retractable hardtop ensuring supreme performance in the BMW M3 Convertible with nothing but the sky above.
- Authentic BMW M design as the expression of superior drive power; aluminium engine lid with striking powerdome; characteristic front end with large air intakes; powerfully flared wheel arches; specific BMW M interpretation of the classic lines of a BMW Convertible with its dynamically stretched silhouette, low waistline and muscular, low-slung rear end; gill elements in the front side walls; M-specific side sills contoured even more specifically towards the rear of the car as a visual tribute to rear-wheel drive; rear air dam with diffuser optimising the flow of air beneath the car; dual tailpipes typical of BMW M.
- Exclusive driving experience: The unique power and performance of a BMW M3 combined with an incomparably intense experience of the sun and wind unique to a BMW Convertible.
- The BMW M3 Convertible is powered by BMW M's brand-new V8 displacing 4.0 litres and developing maximum output of 309 kW/420 hp; maximum torque is 400 Nm/295 lb-ft at 3,900 rpm; maximum engine speed 8,400 rpm, optimum muscle and thrust throughout the entire range of engine speed.
- Individual throttle butterflies, variable double-VANOS camshaft control, Brake Energy Regeneration; engine 15 kg lighter than the six-cylinder power unit on the former model.

- Acceleration to 100 km/h in 5.3 seconds, top speed 250 km/h (155 mph) (limited electronically), average fuel consumption in the EU test cycle 12,9 litres/100 kilometres (equal to 21 mpg imp).
- Manual six-speed gearbox with integrated, temperature-controlled oil cooling; two-plate clutch optimised for mass inertia.
- MDrive for setting and retrieving the driver's favourite engine control map, suspension and DSC set-up and Servotronic control map as an additional option.
- Brand-new suspension with specific, convertible-based reinforcements in typical M configuration, weight-optimised components and M-specific axle kinematics for a highly dynamic driving experience; forged aluminium track control arms; compound high-performance brake system.
- Optional EDC Electronic Damper Control with three selectable control maps; adaptive damper set-up responding to changes on the road surface and in the driver's style of motoring; EDC allowing appropriate adjustment to extremely dynamic driving conditions at any time, irrespective of the mode chosen.
- Retractable hardtop in lightweight steel structure; three-piece roof structure with fully automatic opening and closing function; remote control of roof opening function featured as standard; opening time 22 seconds; optimum all-round visibility with hardtop closed thanks to large window areas.
- Body structure with extremely high standard of torsional stiffness; all-round occupant protection by frontal and head/thorax airbags, three-point inertia-reel seat belts on all seats, belt latch tensioners, belt force limiters and central safety electronics for appropriate control of restraint systems including rollover protection with roll bars moving up automatically behind the rear seats; bi-xenon dual headlights featured as standard, Adaptive Headlights as an option.
- Upgraded, high-class interior with a wide range of customisation options; innovative colour and materials concept; two rear seats with single seat contours; BMW Individual High End audio system with nine-channel amplifier and 16 high-output loudspeakers available as an option; M-specific paintwork and equipment variants.

Experience Power, Enjoy Freedom: The new BMW M3 Convertible.



The BMW M3 model family is being upgraded by yet another fascinating player: The new BMW M3 Convertible, the third body version of BMW's high-performance sports car following the Coupé and Saloon, offers new possibilities to experience uncompromising driving dynamics.

Beneath the engine compartment lid lurks the V8 power unit displacing 4.0 litres and with all the features of a high-speed engine developed brand-new from the ground up for the BMW M3. Above the heads of the driver and passengers is either the three-piece hardtop opening and disappearing completely into the rear roof compartment at the touch of a button in just 22 seconds or of course the blue sky and the thrill of open air.

The new BMW M3 Convertible is a top-flight athlete able to offer truly outstanding performance not only as a sports car, but also with many other qualities, top performance, and highlights in motoring elegance, making every moment in the car an experience in driving pleasure and keeping the driver and passengers top fit at all times.

The BMW M3 Convertible draws its exceptional dynamic driving potential from its new eight-cylinder power unit developing 309 kW/420 hp from 3,999 cubic centimetres. Maximum torque of 400 Newton-metres or 295 lb-ft is just as impressive as maximum engine speed of 8,400 rpm.

This high engine speed concept so typical of BMW M engines comes straight from the latest Formula 1 power unit raced by the BMW Sauber F1 Team. Clearly, this outstanding principle of engine power ensures unique torque and muscle also in the BMW M3 Convertible in transmitting engine power through the variable M Differential Lock to the rear wheels.

Acceleration to 100 km/h comes in just 5.3 seconds and the car continues to surge ahead with increasing power and performance as the driver keeps his foot on the gas pedal, all the way to the car's top speed of 250 km/h or 155 mph, where the engine's electronic control unit sets a limit to the ongoing speed and performance of this open-air athlete.

Outstanding performance and thrilling dynamics of this kind create the first impression conveyed by the BMW M3 Convertible right from the start: This very special two-door performer not only comes with the same drive

technology as the BMW M3 Coupé and the BMW M3 Saloon, but is also a brand-new development from the ground up, again boasting all the features so typical of a BMW M model.

The BMW M3 Convertible thus transfers motorsport technology to everyday motoring, meeting even the greatest demands made of such a high-performance car. In its character, therefore, it is first and foremost a BMW M3, while nevertheless betraying its unique identity side-by-side with the Coupé and Saloon.

Tradition and innovation: the fourth BMW M3 Convertible, the first model with a retractable hardtop.

BMW M GmbH has a long tradition in combining the thrill of a high-performance sports car with the unique pleasure of motoring in the open air, after the first BMW M3 Convertible was presented no less than 20 years ago.

And since the two following generations of the BMW M3 Coupé were also joined by a BMW M3 Convertible, this concept has a long and consistent story to look back on, although the fourth edition differs from its predecessors on one essential point: For the first time a retractable hardtop protects the driver and passengers in the BMW M3 Convertible from wind and weather.

Within the passenger compartment the three-piece roof ensures unrestricted all-year driving pleasure and excellent noise control. It offers truly impressive robustness and sturdiness in design and construction, highlights the sheer value of the car and, through the large windows, ensures optimum all-round visibility featuring a genuine coupé ambience within the interior.

As soon as the weather is right for motoring with the roof down, the three elements forming the hardtop move up electrohydraulically and fully automatically in a smooth and flowing process, swivelling to the rear and coming to a rest in a compact stack above one another in the rear roof compartment.

This extremely compact and space-saving accommodation of the roof elements enhances both the looks of the open-air BMW M3 and the driving experience so thrilling to the driver and passengers. The low-slung, elegantly stretched silhouette reflects the character typical of a BMW M3 Convertible not only in its looks, since the low waistline also ensures a unique and particularly intense experience of the sun shining down and the wind rushing by.

Also featured on the M3 Convertible: know-how from motorsport as the foundation, unique design as the principle.

Within the wide range of models from BMW M GmbH, the BMW M3 has always been the strongest and most powerful reflection of motorsport. Indeed, this already applied to the first edition of the BMW M3 launched in 1986 and joined two years later by the first BMW M3 Convertible. The same philosophy then continued with the two subsequent model generations and is now also expressed clearly on the new BMW M3. A direct comparison with the most thoroughbred sports cars in the classic sense of the word also places the BMW M3 firmly in pole position.

Compared with its predecessor, the new BMW M3 Convertible offers significant progress in terms of driving dynamics, which can indeed be clearly measured through the car's performance on the road. Convincing proof of this superiority is the power-to-weight ratio optimised once again over the previous model to just 4.3 kg per horsepower, an exceptionally good figure even for a high-performance convertible of this calibre.

This all-round optimisation of the car comes out clearly also in the driving experience, with the new V8 power unit offering its significantly greater muscle, thrust, torque, fast-revving driving qualities and spontaneity also on the new BMW M3 Convertible: The new BMW M3 Convertible not only accelerates a lot faster than its predecessor, but also leaves the handful of similarly powerful open-air models in its segment far behind on the road through its outstanding agility in quick changes of direction, in tight bends or on handling tracks making particular demands of the car. Indeed, it is precisely these handling qualities that reflect the exceptional harmony of the concept so typical of every BMW M Car and also to be enjoyed on the new BMW M3 Convertible.

While the open-air BMW M3 is naturally based on the latest, fourth generation of the "regular" BMW 3 Series Convertible, the new model differs from the standard version fundamentally in terms of both looks and technical features. To begin with, the technical foundation for the new BMW M3 Convertible is provided by the BMW M3 Coupé, unique design as well as drivetrain and suspension technology created for supreme performance coming right at the top in the brief given to the engineers at BMW M.

Apart from the load-bearing body structure, only the doors, the retractable hardtop, the luggage compartment lid, the windows and the rear lights come from the "standard" open-air version of the BMW 3 Series. The range of brand-new body components, therefore, is virtually the same as in the BMW M3 Coupé.

In terms of both design and driving experience: a genuine BMW M3 all the way.

The Convertible naturally stands out at very first sight as a genuine BMW M3. Over and above the aluminium engine compartment lid with its distinctive powerdome and the two openings for air intake, the car is also characterised by the functional design of the front and rear air dams, the specially designed gills in the front side panels also to be admired on the Coupé, the side-sills, as well as exterior mirrors and light-alloy rims in that unique design so typical of BMW M.

The front end is characterised by three large air intakes beneath the radiator grille supplying intake and cooling air to the engine. Sturdy, vertical bars border on the air intakes on either side and enhance the design language so characteristic of the car. Together with the double kidney grille characteristic of BMW and the low-slung headlight units with their bi-xenon main headlights featured as standard, these design highlights give the BMW M3 Convertible its highly dynamic look and appearance.

The overall structure of the car's front end is determined first and foremost by the supply of air to the high-performance power unit, large sections at the front opening up to provide the naturally aspirated engine with a smooth flow of air. It is only obvious, therefore, that for reasons of technical and sporting considerations alone this BMW M Car again does without the foglamps otherwise featured on the BMW 3 Series.

Like on the BMW M3 Coupé, the side-sills come with particularly wide and muscular contours and, through their two interacting surfaces, provide a distinctive flow of air giving the car a lighter and more sporting appearance by making the side panels look even lower and more dynamic. In their design, the side-sills correspond with the shape of the striking body line running from front to rear at the level of the door opener.

Seen from behind, the new BMW M3 Convertible again stands out through its superior and powerful proportions. The lines along the side-sills and the rear air dam dropping gently and smoothly to the rear accentuate the philosophy of rear-wheel drive and the powerful stance of the car on the road. The contours of the harmoniously chiselled diffuser beneath the bumper, in turn, take up the specific shape and design of the air intakes at the front.

The air flow duct and the twin tailpipes for the exhaust positioned far towards the middle of the car appear to draw together the rear end at its lower centrepiece, creating awe-inspiring optical tension interacting powerfully with the horizontal lines of the bumper.

Despite all their similarity in character and style, the Coupé and Convertible are nevertheless quite different, without the slightest risk of confusion. Clearly, the unique design of the BMW M3 Convertible comes primarily from its hardtop – and from the possibility to open the roof whenever the driver and passengers desire.

With the roof down, the BMW M3 Convertible, particularly through its low-slung silhouette, offers a unique symbiosis of athletic style and sporting elegance. At the same time the hardtop gives the car its own individual lines when closed, the BMW M3 Convertible highlighting its identity among other things through the far more accentuated transition from the roofline to the rear as opposed to the more gentle and smoother line on the Coupé. A further point is that both the side window frames and the shaft covers come as standard in matt silver-glistening aluminium, with high-gloss Satin Chrome available as an option.

Special BMW M colours for even greater exclusivity.

Outside, the new BMW M3 Convertible is available with a choice of no less than four special M metallic paintwork colours highlighting in particular the contours and proportions of the body surfaces: Melbourne Red metallic, for example, combines outstanding brilliance with unique depth of colour. Jerez Black offers highly interesting colour nuances through the addition of blue pearl pigments. Powerful Interlagos Blue, through the addition of red colour pigments, provides a highly attractive transition under certain light conditions into violet. And last but not least, Silverstone already featured on the BMW M5 and the BMW M6 is a light silver with a slight touch of blue.

The new BMW M3 Convertible is also available in Alpine White and Black as well as Sparkling Graphite metallic.

The interior: four seats, if you wish with the roof down.

Creating the interior, the designers and other specialists at BMW M have successfully reached their objective to offer the occupants maximum driving pleasure in an ambience perfectly tailored to their requirements. This applies particularly to the driver's seat, with all elements required for active motoring being modified accordingly and, through their enhanced functions, reflecting the exceptional power and performance of the BMW M3 Convertible.

As soon as the retractable hardtop folds up into the rear compartment, the driver and front passenger enjoy a truly incomparable open-air atmosphere further promoted by the low-slung shoulder line, the seating position moved far to the back, and the short windscreen. The result of this concept, obviously, is an optimum experience of open-air motoring.

The frame round the windscreen keeps a generous distance from the heads of the front passengers, allowing the sun and, to a pleasant degree, the wind to flow smoothly into and around the interior.

A further highlight is that the occupants now enjoy an even more direct, undiluted experience of the V8 power unit with its unmistakable acoustics.

Despite the low and sporting seat position, the waistline of the car is also surprisingly low. And since this attractive body line flows almost parallel to the road all the way to the rear, the passengers on the two rear seats designed and finished as single seats also enjoy unlimited pleasure of driving in the open air. Lots of fresh wind as well as unrestricted visibility in all directions therefore characterise the unique experience of driving the new BMW M3 Convertible with the roof down.

For the first time ever: an eight-cylinder in a BMW M3 Convertible.

After a great 15 years, the straight-six power unit featured in the two preceding generations of the BMW M3 and lauded several times over as the Engine of the Year has now found a worthy successor: For the first time all model variants of the new BMW M3 come with an eight-cylinder power unit.

The specifications of this all-new high-performance V8 clearly prove the competence of the engine specialists at BMW M GmbH derived directly from motorsport: Displacing 3,999 cc, the new V8 develops a supreme 309 kW/420 hp. Maximum torque of 400 Newton-metres or 295 lb-ft, in turn, comes at an engine speed of 3,900 rpm. And some 85 per cent of this maximum torque is readily available throughout the enormous engine speed range of 6,500 rpm.

The eight-cylinder nevertheless owes its most outstanding characteristics to the high-speed engine concept so typical of BMW M. Because revving all the way to 8,400 rpm, the engine boasts truly shattering thrust and flexibility.

The experience of power and muscle is therefore simply unique all the way. Power is transmitted to the rear wheels by a six-speed manual gearbox and the all-new final drive.

This combination of engine and transmission provides a feeling of acceleration quite comparable in its spontaneity and ongoing surge of power to the dynamic potential of the most supreme high-performance thoroughbred sports cars.

Apart from specific output of 105 hp per litre, average fuel consumption of 12,9 litres/100 kilometres (equal to 21 mpg imp) determined in the EU test cycle is a clear expression of the engineering art and outstanding skills of the engine development specialists at BMW M GmbH. Through this quality alone, the new BMW M3 Convertible ensures a standard of efficiency quite unique in the small segment of open high-performance sports cars.

Weighing just 202 kg or 445 lb, the V8 power unit of the new BMW M3 is a genuine lightweight. Indeed, it is even 15 kg or 33 lb lighter than the engine in the former model – a six-cylinder.

Production of components using know-how from Formula 1.

The engine block on the new eight-cylinder comes from BMW's light-alloy foundry in Landshut just north of Munich, which also builds the engine blocks for the Formula 1 cars raced by the BMW Sauber F1 Team. The crankcase is made of a special aluminium-silicon alloy making conventional cylinder liners superfluous, since an appropriate cylinder surface is provided by the hard silicon crystals, the iron-coated pistons running directly in this uncoated, honed bore.

With high engine speeds and combustion pressure putting extremely great loads on the crankcase, the crankcase is compact and extra-strong in bedplate design, ensuring very precise and smooth running conditions for the crankshaft.

The forged crankshaft itself is extremely strong in terms of bending and torsional stiffness, while at the same time it only weighs about 20 kg or 44 lb.

Valve management by double-VANOS using engine oil pressure.

The V8 power unit within the engine compartment of the BMW M3 Convertible is equipped with variable double-VANOS camshaft control. Keeping valve adjustment times to a minimum, this technology reduces losses in the charge cycle and improves engine output, torque and response accordingly, with an appropriately positive influence on both fuel consumption and emissions.

A low-pressure version of double-VANOS has been developed especially for the new eight-cylinder to ensure ultra-short and fast adjustment timing even under normal engine oil pressure.

A separate throttle butterfly for each cylinder is the supreme technology not only on a racing engine when it comes to ensuring an immediate response at all times. Which is precisely why the new power unit features eight individual throttle butterflies, two adjuster motors each controlling four throttle butterflies on each row of cylinders. This guarantees a particularly smooth and sensitive response of the engine at low speeds combined with an immediate reaction as soon as the driver calls up more power on the gas pedal.

A smooth and consistent supply of lubricant to the eight-cylinder is ensured by the volume flow-controlled pendulum-slide cell pump delivering exactly the amount of oil required by the engine at any given point in time. Wet sump lubrication optimised for driving dynamics keeps the flow of lubricant consistent and sufficient even in extreme braking manoeuvres, with the system boasting two oil sumps – a small one upfront of the front axle subframe and a larger sump further back. A separate duocentric reflow pump, finally, serves to extract the oil from the front sump and pump it to the rear.

New Engine Management and Brake Energy Regeneration.

A further enhancement is electronic management of the V8 power unit for optimum coordination of all engine functions. At the same time the electronic control unit supports the various functions of the clutch, transmission, steering and brakes all tailored to the specific demands and standards of a BMW M Car. And last but not least, engine management provides a wide range of on-board diagnostic functions, just as it masterminds and controls various ancillary units.

Access to the various engine control maps is also masterminded with the same precision. No less than three different maps are available for engine management, two being activated via a button on the centre console and a further map being controlled via the optional MDrive system. In each case the control maps are influenced by the position of the throttle butterflies in the intake manifold and by other parameters significantly changing engine response.

Ion flow technology serving to recognise the risk of the engine knocking as well as misfiring and miscombustion is a further highlight in engine management. Contrary to conventional technology, this new, revolutionary method detects such risks directly where they may occur, that is within the engine combustion chamber. To do this, the spark plug on each cylinder is carefully monitored and controlled for any indication of knocking. Correct ignition is also controlled in the same process and any mis-firing is effectively detected.

The spark plug thus serves as an actuator for the ignition and as a sensor carefully monitoring the combustion process, thus distinguishing between mis-combustion and misfiring.

This dual function of the spark plug also facilitates diagnostic processes in maintenance and service.

Intelligent energy management with Brake Energy Regeneration enhances the efficiency of the V8 power unit in the new BMW M3 Convertible to an even higher standard. The particular point in this case is that electric power for the on-board network is generated specifically while in overrun and when applying the brakes.

This serves to charge the car's battery without directly using the energy contained in the fuel. As long as the engine is pulling the car, therefore, the alternator generally remains disengaged. Apart from particularly efficient generation of electric power, this also offers the advantage of even more driving power when accelerating.

Six-speed manual gearbox perfectly matched to the V8 power unit.

The new BMW M3 Convertible comes as standard with a manual six-speed gearbox featuring gear ratios perfectly tailored to the high-speed concept of the eight-cylinder engine. With short gear lever travel like in motorsport and crisp, precise movement of the shift lever, the driver is able at all times to transmit the superior power and thrust of the V8 to the rear wheels with the ideal gear ratio.

Integrated, temperature-controlled oil cooling keeps the temperature of the transmission fluid within the right range even under extreme conditions – for example on the race track. The two-plate clutch optimised for mass inertia, in turn, is carefully matched to the superior power and muscular torque of the eight-cylinder. And the six-speed manual gearbox with all the features so typical of BMW M is likewise able at all times to optimise the superior potential of the new BMW M3 Convertible when accelerating and going for superior performance.

Special chassis and suspension for the dynamic performance typical of a BMW M3.

Like the BMW M3 Coupé and the BMW M3 Saloon, the new BMW M3 Convertible also features rear-wheel drive. This principle of splitting up steering and drive forces on the front and rear axle ensures ideal conditions for dynamic driving qualities, very good directional stability, and safe handling. From the start, therefore, the new BMW M3 Convertible offers the ideal configuration for a particularly agile high-performance sports car.

The new BMW M3 Convertible boasts a chassis and suspension tailor-made for the particular requirements and features of an open car. The "foundation", of course, is provided by the chassis and suspension carried over from the BMW M3 Coupé appropriately modified for the specific weight distribution and the different roof on the Convertible. Like on convertibles in general, additional features have been integrated in the new BMW M3 Convertible to optimise its torsional stiffness. Compared with former generations of the BMW M3 Convertible, torsional stiffness particularly important to safety and driving dynamics has been significantly increased to an even higher standard, also taking the increase in engine output into account.

Benefitting from the demanding chassis and suspension, as well as the overall construction of the car, the new BMW M3 Convertible offers dynamic driving qualities quite comparable to the excellent driving features already ensured by the BMW M3 Coupé and Saloon.

Rear axle with reinforced suspension and modified air flow.

On the rear axle the V-bars already featured on the Coupé and Saloon to provide the necessary reinforcement have been extended all the way to the side-sills. This configuration enhances chassis stiffness around the rear axle and provides appropriate axle kinematics for a car with supreme engine power and sporting performance all round. In addition, the engineers at BMW M GmbH have modified the flow of air beneath the car at the rear to the change in design and construction, thus ensuring optimum cooling on the final drive.

In its overall construction, the five-arm rear axle is designed consistently for minimum weight. The anti-roll bar, for example, is a hollow tube in the interest of significant weight reduction. So despite the slightly larger diameter of the tube than on the Coupé, the anti-roll bar on the BMW M3 Convertible offers an ideal combination of superior efficiency and low weight. Together with the axle arms made of forged aluminium and the aluminium dampers, the reduction in weight ensured in this way adds up to approximately 2.5 kg.

The front axle assembly is the same as on the Coupé and Saloon, with nearly all components on the double-arm front axle made of aluminium. A high standard of lateral stiffness at the front reflecting the superior power of the engine is ensured among other things by extra-stiff spring struts, swivel mounts and axle supports specific to BMW M, and an additional light-alloy reinforcement panel beneath the engine. And like the anti-roll bar at the rear, the anti-roll bar on the front axle is also a tubular structure serving to optimise its functions and minimise its weight.

Compound brake system and forged light-alloy wheels.

The new BMW M3 Convertible comes with the same extra-large compound brakes as on the Coupé and Saloon. The inner-vented, cross-drilled grey-cast iron brake discs measuring 360 millimetres/14.2" in diameter at the front and 350 millimetres/13.8" at the rear are connected to the aluminium disc support by stainless-steel pins cast into position.

With this configuration significantly reducing the thermal loads acting on the brake discs, brake performance and service life are enhanced accordingly. A further advantage of this high-performance brake system is the additional reduction of weight where it really counts, that is on the car's unsprung masses.

An ongoing, continuous wear indicator permanently monitors the condition of the brake pads, a display in the cockpit informing the driver of their remaining service life. This not only enhances safety on the road, but also avoids unnecessary service and maintenance.

The underpressure required for the brake servo is generated by an electrical pump independently of engine speed.

The new BMW M3 Convertible comes as standard on forged light-alloy wheels in BMW M design. Rim dimensions are 8.5 x 18 inches at the front on 245/40 low-profile tyres and 9.5 x 18 inches at the rear on 265/40 tyres.

Servotronic with two control maps for optimum steering power assistance.

The new BMW M3 Convertible comes with rack-and-pinion steering featuring hydraulic Servotronic support. Servotronic reduces the steering forces required, with the degree of power assistance related to the speed of the car on the road. At low speeds, therefore, Servotronic provides a lot more steering support to reduce the steering effort, for example when parking. At high speeds, on the other hand, power assistance is reduced accordingly in the interest of enhanced directional stability.

Using the optional MDrive configuration system, the driver is able to pre-select the actual effect and assistance factor provided by Servotronic following either the Normal or the Sports control maps.

In the Sports setting, Servotronic gives the driver a particularly direct feeling for optimum feedback on road conditions. On winding country roads and at high speeds this enables the driver to steer the car with unparalleled precision. In the Normal mode, by contrast, power assistance is increased consistently throughout the entire speed range.

Variable M Differential Lock for perfect traction on the rear axle.

The new final drive features BMW's variable M Differential Lock also on the BMW M3 Convertible. Generating up to 100 per cent locking action when required in a fully variable process, this special differential lock ensures optimum traction on all surfaces and in fast, dynamic bends.

The variable M Differential Lock responds to differences in speed between the left and right rear wheel and offers ideal support enhancing the positive qualities of rear-wheel drive to an even higher standard.

Dynamic driving programs in M-specific configuration.

Electronic dynamic driving programs support the driver in dynamic situations approaching the limits to driving physics. DSC Dynamic Stability Control, for example, offers an even wider range of functions on the new BMW M3 Convertible in the interest of enhanced driving safety. When necessary DSC will intervene specifically in the brakes on individual wheels and reduce engine power in order to maintain driving stability. Pre-loading of the brake pads serves, as another example, to give the driver valuable time when applying the brakes in an emergency and significantly shorten his stopping distances. Yet a further feature offered by DSC is regular Dry Braking not even noticeable to the driver, keeping the brake discs free of the usual water film on the surface when applying the brakes in the wet and thus avoiding any loss of brake power.

Dynamic Stability Control includes ABS anti-lock brakes, ASC Automatic Stability Control preventing the wheels from spinning on surfaces with reduced grip, a Start-Off Assistant preventing the car from rolling back when setting off on an uphill gradient, and CBC Cornering Brake Control reducing the risk of the car spinning or swerving out of control in a bend. A further feature of DSC is its ability to increase brake pressure whenever the brake system becomes extremely hot, thus maintaining a consistent level of brake power (Fading Compensation).

The behaviour and response of these dynamic driving programs is naturally tailored to the superior performance of the BMW M3 Convertible. The system thus intervenes with electronic precision in an appropriate style matched to the excellent dynamic qualities and supreme power of the car. A further point is the driver's option to configure certain parameters individually, thus adjusting the response of the car to his personal preferences.

Pressing a button in the centre console, the driver is able to completely deactivate DSC Dynamic Stability Control, the particularly ambitious driver therefore being able in such a case to push the dynamic potential of his car to the utmost. So when driving this sports car on a race track, the experienced and ambitious specialist is able to reach the utmost limits to driving physics and enjoy all of the car's dynamic power in bends.

Electronic Damper Control responding spontaneously to every change in driving conditions.

As an option the new BMW M3 Convertible may be equipped with EDC Electronic Damper Control. Adjusting damper forces electrohydraulically, EDC optimises both the car's vertical vibration behaviour as well as its yaw and roll motion in bends and its dynamic axle load distribution when applying the brakes and when accelerating.

Like the engine control map, operation and implementation of Electronic Damper Control may be varied at the simple touch of a button on the centre console to the driver's individual preferences, offering the driver the choice of three settings Normal, Comfort, and Sports. The range of damper adjustment covered in this way is far greater than with conventional systems of this kind.

Quite generally, the new BMW M3 Convertible offers a wide range of driving qualities and characteristics all the way from very dynamic to more comfortable. In the Sports mode, EDC keeps the body of the car and all movements particularly firm and almost rigid. Wherever the driver does not seek such a particularly sporting set-up, he can opt either for the Normal or for the Comfort mode. In such cases, depending on the set-up chosen, the system responds also to smaller bumps in the road by more sensitive behaviour and with longer damper travel.

A further point is that EDC follows an adaptive pattern in all operating modes, adjusting damper forces quickly and sensitively to any change in driving conditions. As soon as faster movement of the steering wheel and higher steering angle speeds indicate that the driver is opting for a more dynamic style of motoring on winding roads, damper forces are increased automatically, EDC possibly even reaching the maximum limit of damper force for a short spell under such conditions, regardless of the set-up currently chosen. This perfectly supports any spontaneous changeover from comfortable cruising to a more sporting and active style of motoring.

Offering qualities of this kind, EDC ensures that the chassis and suspension are able to perfectly handle the very different driving conditions and demands faced in such a high-performance convertible. Featured in the new BMW M3 Convertible, EDC thus offers the entire range of motoring qualities from smooth gliding at low speeds all the way to dynamic motoring in a most sporting style. And with optional MDrive, the driver is even able to save his preferred EDC set-up as part of the car's individual configuration.

MDrive button on the steering wheel: enjoying the perfect set-up at all times.

On the new BMW M3 Convertible the iDrive control system may be enhanced as an option by an additional MDrive function. Using MDrive, the driver is able to access the engine and Servotronic control maps, the various modes of DSC, and, as a further option, the various EDC set-ups available. This gives the driver the possibility to pre-select his personal set-up for all dynamic driving systems open to configuration, thus enjoying "his" perfect set-up in accordance with his personal preferences.

The car configuration defined individually in this way is then saved and may be retrieved immediately simply by pressing the MDrive button on the multifunction steering wheel, regardless of the system setting previously chosen by way of the function buttons. This enables the driver to enjoy the versatile character of his car in every respect and with all its facets, changing to his personal set-up at the simple touch of a button.

MDrive also serves as an exclusive feature to activate the Sports Plus engine control map, the M Dynamic Mode within the DSC range, and the Sports Servotronic control map.

Torsionally stiff body as the foundation for superior occupant safety.

The extra-strong structure of the body with optimised torsional stiffness and restraint systems tailored to a convertible provides the foundation from the start for a high standard of passive safety and all-round occupant protection in the new BMW M3 Convertible. Especially the restraint systems are particularly flexible, being activated electronically according to current requirements and driving conditions.

The use of high-strength steel for the extra-large load-bearing structures, together with the exactly defined arrangement of deformation zones in the event of a collision, guarantees appropriate diversion and, respectively, absorption of the forces acting on the car. The space available for deformation is used in full in order to avoid damage to the passenger cell or keep any such deformation in the passenger area as small as possible even in a severe collision.

The airbags, belt latch tensioners and belt force limiters are activated by the central safety electronics as a function of the type and severity of a collision. Using sensors in the middle of the car, in the B-pillars and in the doors, the electronic safety "brain" determines which safety components will offer the occupants maximum protection, activating only those restraint systems actually required.

The driver and front passenger are protected by frontal and side airbags activated in two stages in accordance with the severity of a collision. The head/thorax airbags at the side are integrated in the seat backrests and inflate in a side-on collision over a large area extending from the bottom of the backrest all the way to the top edge of the headrest. This gives the occupants optimum protection on their upper body and head, regardless of their personal seating position.

The side airbags protect both the body and the head of the occupant in the event of a collision from the side, while the risk of leg injury in a head-on collision is reduced on the driver's side by predetermined deformation of the footrest.

The BMW M3 Convertible also comes with a rollover sensor system permanently monitoring vertical and horizontal movement of the car. At the same time a central computer evaluates data on current driving conditions, so that when the roof is open rollbars positioned behind the headrests are activated and move up immediately whenever the system registers the risk of a rollover. The belt latch tensioners for the front seats and the head/thorax airbags are activated at the same time, and as a further precaution for the event of a rollover the A-pillars and the windscreen frame are even stronger and more stable than usual.

The interior: enjoying freedom and dynamism for four.

The freedom of driving in the open air and the dynamic performance of a BMW M3 – in the new BMW M3 Convertible this is a outstanding experience for up to four occupants. The front seats feature integrated belt systems, while the centre console extending all the way to the back splits the rear seat bench into two separate seats with generous headroom. In comparison with the former model, shoulder room at the rear is up 9 centimetres or 3.5", elbow room has been increased by an even more significant 11 centimetres or 4.3". Access to the rear seats is facilitated by the Easy Access function on the front seats, and the seat release lever is arranged in its ideal ergonomic position at the top on the outside of the backrest.

The new BMW M3 Convertible proves its superior touring qualities also through unusually variable storage capacities and options. Even with the roof open, the luggage compartment still offers capacity of 210 litres or 7.35 cubic feet, enough for a large hard-shell suitcase or up to two golf bags.

The rear compartment in the Convertible may also be used as additional storage space. In this case, after folding down the single-piece rear seat backrest, the driver and front passenger are able to load even bulky objects on the flat surface without the risk of soiling, let alone damaging, the seat upholstery.

A feature quite unique in a convertible of this calibre is the optional opening between the luggage compartment and the passenger area measuring about 40 centimetres or almost 16" in width. Clearly, this is ideal for through-loading long objects such as skis, snowboards or golf bags from the luggage compartment into the rear passenger area.

Qualities of this kind make the new BMW M3 Convertible the ideal car for the driver and passenger travelling alone and enjoying superior versatility in every respect. But even when all four seats are occupied, this through-loading facility connecting the luggage and the passenger compartments may be used conveniently thanks to the large opening between the rear seats.

The opening and closing mechanism for the retractable hardtop is activated by a switch in the centre console. A further possibility is to open the hardtop by remote control from the central locking.

Enhanced remote control with comfort access is available as an option, enabling the driver to start the car without even using a key and offering the possibility to close the hardtop from a distance.

To avoid any inadvertent activation of the hardtop, this signal to close the roof is transmitted to the car only up to a distance of four metres or just over 13 feet at the very most.

Comfort access also allows particularly convenient loading and unloading of the luggage compartment with the roof open. In order to improve access to the luggage compartment in such a case, the hardtop, when open, is moved by remote control to an interim position enabling the driver to conveniently take out large objects such as golf bags.

The process of loading the car is also facilitated by the variable panel separating the roof from the luggage compartment. With the hardtop closed, this cover may be swivelled up electrically, enlarging luggage space to a volume of up to 350 litres or 12.25 cubic feet.

The cover panel is activated by a switch in the centre console of the car. Once it has been lowered, the new BMW M3 Convertible can start to convert into an open-air model. The luggage compartment lid, in turn, comes with a Soft-Close function smoothly and gently pulling the lid into position in an automatic process after loading and unloading.

Interior design: focusing on an active driving experience.

Through the athletic design of its body, the new BMW M3 Convertible clearly proves its sporting qualities with the hardtop both open and closed.

The interior supplements this particular flair and appearance, seeking to offer the driver the optimum driving experience and to give all occupants a beautiful ambience tailored to their needs and preferences. Powerful contours and flowing lines emphasising in particular the concave and convex surfaces surround the four seats. The horizontal lines dominating the dashboard area and the harmonious surfaces on the side panels add a particularly dynamic touch to the interior.

The control area formed by the cockpit flows between the front seats into the centre console oriented in its geometry to the driver through its discreet sweeping shape. The console itself is finished in black leather, harmoniously continuing the instrument surrounds and control area in both colour and design. Three function switches (Power, DSC Off, and optional EDC) are positioned on the side facing the driver to activate or deactivate the electronic dynamic driving programs.

Over and above the clear design and optimum ergonomics of all controls and instruments, the choice of colours within the interior also serves to help the driver concentrate on driving conditions and the particular experience he enjoys in his new BMW M3 Convertible. Regardless of the equipment colour chosen by the driver, the footwells and the upper section of the instrument panel are finished in Anthracite. In addition, the dark roof lining on the hardtop and the lining on the A-pillars in the same colour emphasise the clear orientation to the driver so typical of BMW M.

The consistently dark colour scheme around the windscreen again helps the driver concentrate in full on the road and traffic conditions. Moving on to the front passenger and the passengers sitting at the rear, the colour scheme also enhances the experience of driving and enjoying a genuine sports car. The door panels and rear side panels, for example, appear lower than they actually are through the use of black leather. A double seam emphasising the exclusive character of the materials chosen and their finish separates the upper section of the door and side panels from the interior sections and surfaces finished in the respective equipment colour.

BMW M all the way: rev counter with a variable warning zone.

Right from the start when getting into the car, the driver and passengers will see from the M logo on the door entry strips that this Convertible is a genuine BMW M3 – a car unique in its own right. The dual circular instruments typical of BMW, the speedometer and fuel gauge as well as the rev counter and oil temperature gauge all come in special BMW M design and visualise the supreme power and performance of the eight-cylinder. The numbers stand out clearly in white from a black background, the indicator needles in the traditional red of BMW M are particularly easy to see and follow.

The variable warning field on the rev counter is again typical of a BMW M Car informing the driver during the warm-up phase of the speed at which he can run the engine, depending on current engine oil temperature: The borderline between the pre-warning area in yellow and the warning area in red moves up on the new BMW M3 Convertible as a function of increasing oil temperature until finally reaching its limit of 8,400 rpm.

Digital indicators showing the time, the outside temperature, mileage and telltale control lights are positioned between the two circular dials.

The M leather steering wheel is the perfect interface between man and machine. Its rim with special thumb contours resting in the driver's hands in sporting style ensures an optimum grip for precise movements of the steering wheel. The spokes in the wheel house the remote control buttons for the audio system and mobile phone and, as an option, the MDrive button activating the various set-ups saved in the car. A further button may be programmed by iDrive, offering the driver a personalised function.

Wide range of personalisation options in the interior.

The front seats specially made for open-air motoring with their integrated belt systems have again been modified to the specific requirements of BMW M, ensuring excellent side support even in particularly fast and dynamic bends. As an option both the driver and front passenger can enjoy seats with backrests adjustable for width.

The new BMW M3 Convertible comes as standard with high-quality leather on all four seats. This newly developed Novillo fully tanned leather offering a particularly elegant and sporting touch through its smooth and soft surface, is available either in classic Black or in Palladium Silver, Bamboo Beige and Fox Red.

As a further option the range of Novillo leather may be extended to the lower section of the dashboard, the lid on the glove compartment, and the side panels on the centre console.

Sun Reflective Technology featured on the leather surfaces of the new BMW M3 Convertible ensures unlimited driving pleasure with the roof down in bright sunshine and summer weather. Special cooling pigments integrated into the material reduce surface heating as a result of sunshine by up to 20° C, even when the car has been parked in bright sunshine for a long time with the roof down. In practice this means that while the leather upholstery will be relatively warm after being exposed to the sun for a long spell, it will not get hot.

Four exclusive trim strip options extending across the entire width of the dashboard beneath the control display and instrument cluster offer further options in personalising the new BMW M3 Convertible. Interior trim in Titanium Shadow comes as standard on the new model, with optional Aluminium Shadow, Carbon leather, and a high-class wood option using fine-grain plane wood finished in Anthracite. Each of these trim options gives the interior of the Convertible its very special touch ranging from technical all the way to sporting and elegant.

Unique: automatic air conditioning with a special convertible mode.

The new BMW M3 Convertible comes as standard with automatic air conditioning. And in this case the temperature control features an additional so-called convertible mode for use with the roof down. Once the driver has opted for this mode, the flow of air and ventilation depends less on the current temperature inside the car and more on the outside temperature and the actual degree of sunshine.

Not only the air conditioning, but also the supply of fresh air when driving with the roof down may be adjusted to different requirements. This is made possible by the wind deflector offered as standard to reduce air swirl within the interior also at high speeds. The wind deflector fits firmly in position on side supports at the rear, and is then pulled up to provide its full effect.

Since the rotary button for the holding mechanism moves the attachment points on both sides of the wind deflector, one person alone is able to fit the deflector easily and safely into position either on the driver's or the front passenger's side. And last but not least, the wind deflector panel covering the rear seats may be tilted up at any time to take up bags, shopping and other utensils whenever required.

Perfect visibility: bi-xenon headlights featured as standard, Adaptive Headlights and High-Beam Assistant coming as an option.

Featuring bi-xenon dual headlights as standard, the BMW M3 Convertible ensures perfect illumination of the road in the dark. The headlights come with corona rings typical of BMW to provide an appropriate daytime driving function. When activating the daytime lights, two light rings come on in each of the two headlight units, giving the car a striking look not only in the interest of better visibility, but also to create a clear sign of identification specific to the brand.

The new BMW M3 Convertible is available as an option with Adaptive Headlights guaranteeing appropriate illumination of the road ahead in accordance with any bends or winding roads the driver may be taking. The direction of rotation of the headlights depends on the current steering lock, the yaw rate and the road speed of the car.

Another feature included in this option is the Bending Lights activated at a speed of up to 40 km/h or 25 mph as soon as the driver operates the direction indicator or turns the steering wheel firmly in one or the other direction. These Bending Lights ensure optimum illumination of the road ahead when manoeuvring and in tight serpentine.

The High-Beam Assistant also available as an option ensures additional comfort when driving at night. The system switches back automatically to the low beam once vehicles coming in the opposite direction are in sight or the distance to a vehicle driving ahead drops below a certain limit.

iDrive control with eight favourite buttons.

BMW iDrive control complete with the Controller positioned on the centre console serves to mastermind the air conditioning, communication, navigation and entertainment functions. The control display arranged at eye level in the middle of the instrument panel then presents the status of the functions chosen, together with further options in the respective menu or, whenever required, the graphic map displayed by the optional navigation system.

BMW iDrive also serves to configure the settings on the optional MDrive control system.

To simplify operation of iDrive control to an even higher standard, the driver is able to use eight personalised favourite buttons. So just by pressing one button, he is able to retrieve telephone numbers he dials particularly often, a regular destination, or his favourite radio station.

Various navigation systems, the mobile BMW Online internet portal, and the BMW Assist telematics service are all available as options. On cars fitted with a navigation system including a preparation kit for a mobile phone and a Bluetooth interface, the driver may use BMW TeleServices free of charge. The range of functions offered in this way extend from the Automatic Teleservice Call via the Manual Teleservice Call all the way to BMW Teleservice Diagnosis including Teleservice Help. To make a Teleservice call, the car independently – using the CBS Condition Based Service function as an on-board diagnostic system – determines the type of service required next and when it is needed.

To determine the next visit to a workshop, the new BMW M3 Convertible is able to transmit data on engine oil, brake fluid, brake discs and pads as well as other parts and components subject to wear and tear through a telephone line to the driver's BMW Service Partner.

In the event of an electronic deficiency or malfunction, BMW Teleservice Diagnosis serves to transmit any defect codes to BMW Breakdown Assistance. And if it is possible to remedy the cause of the defect by re-setting the software on the appropriate control unit, the command required for this purpose may be sent directly to the car from the BMW Breakdown Assistance Centre.

BMW Individual High End Audio System for perfect sound quality.

The new BMW M3 Convertible comes as standard with a high-class audio system. The CD drive included in this audio system is also able to play music files in MP3 format. As an option supplementing the AUX-in plug featured as standard, the driver has the choice of a USB interface serving to integrate various external MP3 players or other data media such as a conventional USB stick into the car's audio system.

As a further option the new BMW M3 Convertible may also be equipped with the BMW Individual High End Audio System developed by BMW M GmbH and tailored exclusively to this very special model. In this case 16 high-performance loudspeakers with neodym magnetic drive and extremely stiff Hexacone membranes, a digital nine-channel amplifier with maximum output of 825 Watt, and extra-precise frequency switches guarantee unparalleled quality of sound.

Another feature quite unique in the world of motoring is Dirac Live technology for processing sound signals, correcting the loudspeaker pulse and thus ensuring linear playback of all sounds within the car in perfect time synchronisation.

The quality of sound ensured in this way, the unique playback and rendition of even the most exquisite and intricate sounds, will thrill not only the driver, but rather all occupants in the new BMW M3 Convertible, offering them all an exceptional experience in dynamic sound with all its facets.

Speed-related volume control and speed-related equalising also help to ensure an optimum experience in sound in all situations and under all conditions.

The BMW Individual High End Audio System is masterminded by the iDrive Controller, with its main functions being controlled via the audio control units on the centre console.

The BMW M3 Convertible: supreme performance is the objective, sheer driving pleasure is the result.

The BMW M3 Convertible offers many new opportunities to experience supreme performance and enjoy equally supreme freedom. And in all cases it is the driver's choice to enjoy particular options and emotions at the wheel. For the BMW M3 Convertible offers power reserves the driver will use in full only very rarely – power reserves of the same unique calibre as in the two other versions of the BMW M3 – but wonderful to have and savour whenever you wish.

A wide range of options in configuring the driving dynamics and driver assistance systems enables the driver also of the open-air BMW M3 to enjoy all his preferences in practice and in every respect. And thanks to its retractable hardtop, the BMW M3 Convertible offers an additional, truly unique option: With the roof closed, this new model provides the unrestricted comfort and style of a genuine coupé. With the roof open, the driver and his passengers enjoy equally unrestricted freedom with an incomparable feeling of the sun and wind around them. So there is no need for compromises, regardless of the roof's position.

Like its Coupé and Saloon counterparts, the BMW M3 Convertible offers truly unique style and character. It is indeed the unique qualities of the car that give this third model in the M3 range its fascinating, individual aura, while nevertheless retaining the core qualities and features of the BMW M3: Technology derived from motorsport ensures superior performance at all times and, as a result, a unique driving experience on the road. First and foremost, therefore, the Convertible remains a fully-fledged BMW M3 – a high-performance car able to offer the driver a truly supreme and dynamic driving experience day in and day out.

Even though the full power and performance of the BMW M3 can only be used on the race track, the car's impressive supremacy also in city traffic and on country roads ensures sheer driving pleasure in a particularly fascinating rendition. And even that is not all, for there are countless roads and routes the world over which, while being thoroughly enjoyable in the BMW M3 Convertible with the roof closed, offer an even higher level of enjoyment and satisfaction with the roof open in perfect convertible weather. So whoever demands top performance and knows how to enjoy supreme pleasure in life will be thrilled time and again by the new BMW M3 Convertible.

3. Specifications.



BMW M3 Saloon		
Body		
No of doors/seats		2/4
Length/width/height (EU, unl)	mm	4,615/1,804/1,392
Wheelbase	mm	2,761
Track, front/rear	mm	1,540/1,539
Turning circle	m	11.7
Tank capacity	approx ltr	63
Cooling system incl heater	ltr	11.4
Engine oil	ltr	8.8
Transmission fluid	ltr	2.5
Final drive fluid	ltr	1.2
Weight, unladen, to DIN ¹⁾	kg	1,810
Weight, unladen, to EU ²⁾	kg	1,885
Max load to DIN	kg	470
Max permissible to DIN	kg	2,280
Max axle load, front/rear	kg	–/–
Max trailer load ¹⁾		
Braked (12%/unbraked)	kg	–
Max roof load/max trailer download	kg	75/–
Luggage compartment to DIN	ltr	210–350
Air drag	C _d x A	0.688
Power Unit		
Config/No of cyls/valves		V/8/4
Engine management		MS S60
Capacity	cc	3,999
Bore/stroke	mm	92.0/75.2
Compression ratio	:1	12.0:1
Fuel grade	RON	98 (95)
Max output	kW/hp	309/420
at	rpm	8300
Max torque	Nm/lb-ft	400/295
at	rpm	3900
Electrical System		
Battery/installation	Ah/–	90/luggage comp
Alternator	A/W	180/2,520
Chassis and Suspension		
Suspension, front	Aluminium two-joint spring strut axle with tiebar; small, positive steering roll radius; Compensation lateral forces; anti-dive	
Suspension, rear	Five-arm axle with anti-squat and anti-dive	
Brakes, front	Single-piston swing-calliper compound disc brakes	
Diameter	mm	360 x 30, vented and cross-drilled
Brakes, rear	Single-piston swing-calliper compound disc brakes	
Diameter	mm	350 x 24, vented and cross-drilled
Driving stability systems	ABS, ASC, CBC, DSC; Variable M Differential Lock	
Steering	Rack-and-pinion steering with hydraulic assistance and Servotronic	
Steering trans ratio:	:1	12.5
Type of gearbox		SG 6
Gear ratios	I	:1 4.055
	II	:1 2.369
	III	:1 1.582
	IV	:1 1.192
	V	:1 1.000
	VI	:1 0.872
	VII	:1 –
	R	:1 3.678
Final drive	:1	3.846
Tyres, front/rear	245/40 ZR18/265/40 ZR18	
Rims, front/rear	8.5J x 18 EH2+ IS 29 cast aluminium/9.5J x 18 EH2+ IS 23 cast aluminium	

BMW M3 Saloon		
Performance		
Power-to-weight ratio to DIN	kg/kW	5.9
Power-to-weight ratio to DIN	kg/hp	4.3
Output per litre	kW/ltr	77.3
Output per litre	hp/ltr	105.0
Acceleration 0–100 km/h	sec	5.3
Top speed	km/h	250 ⁴⁾
Fuel Consumption in EU		
Urban	ltr/100 km	18.7
Extra-urban	ltr/100 km	9.6
Composite	ltr/100 km	12.9
CO ₂ , overall	g/km	309
Miscellaneous		
Emission rating		EU4

¹⁾ Weight of vehicle in road trim (DIN)

³⁾ May be increased under certain conditions

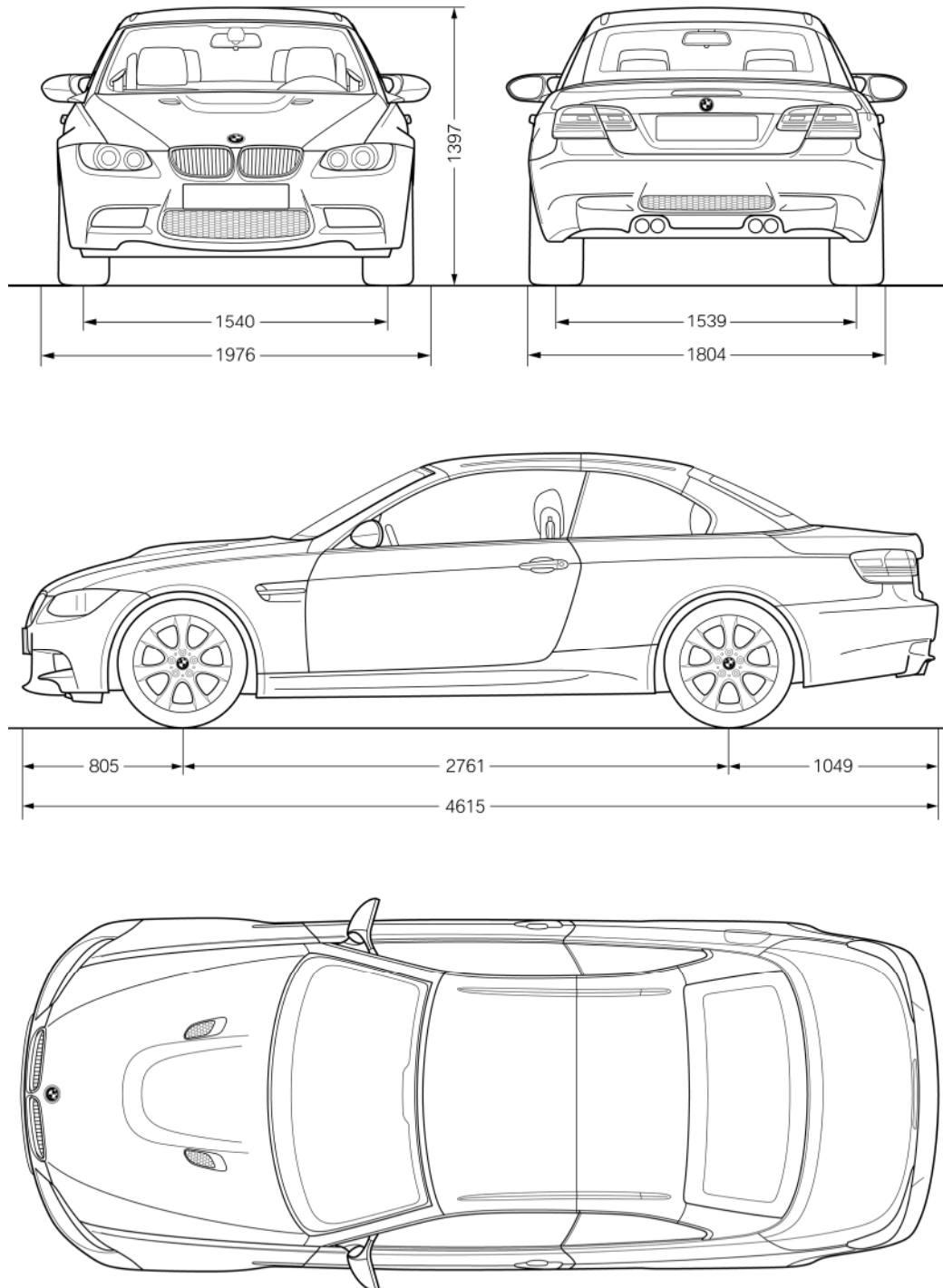
²⁾ Weight of vehicle in road trim (DIN) plus 75 kg for driver and luggage

⁴⁾ electronically limited

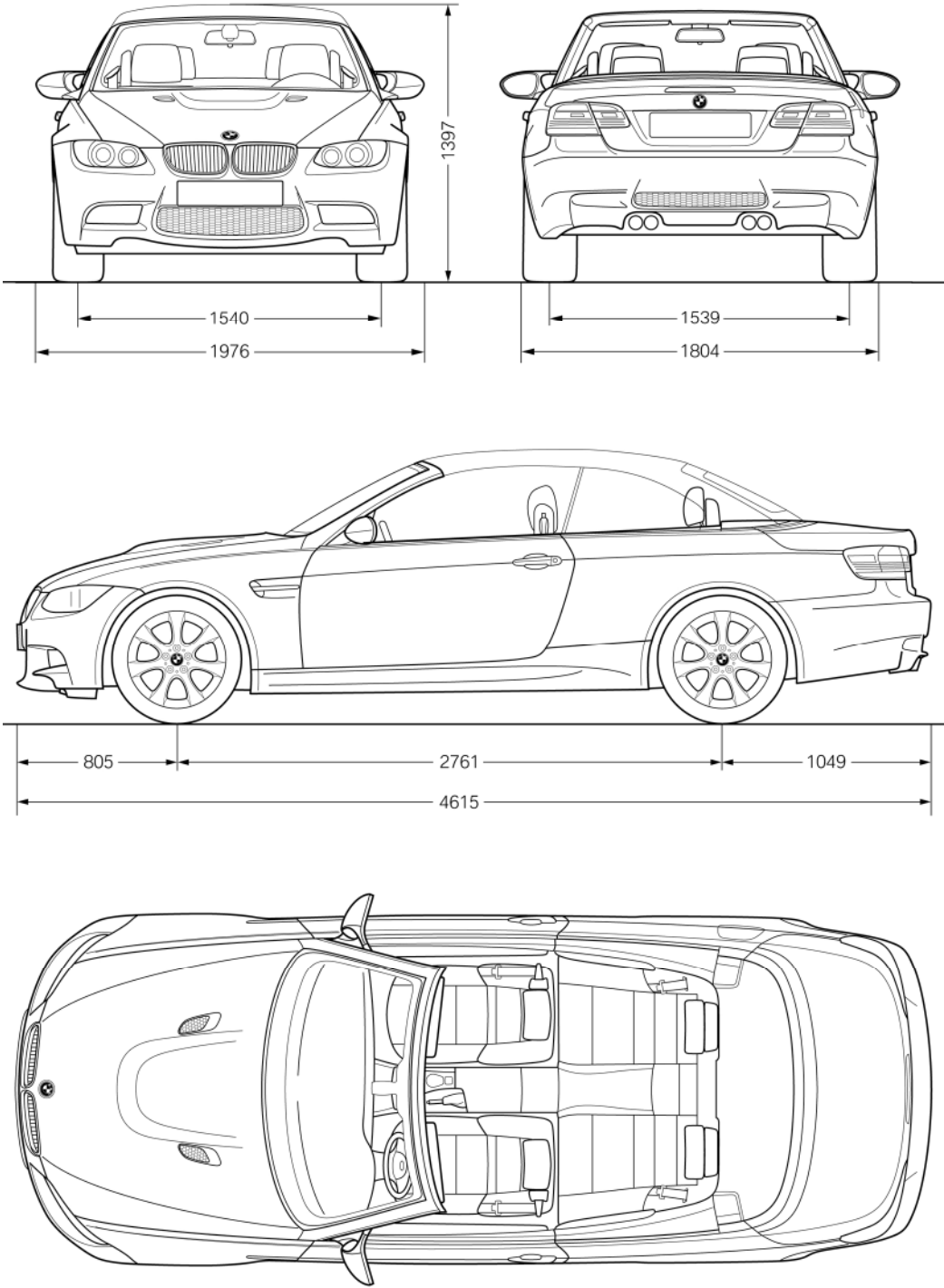
4. Exterior and Interior Dimensions.



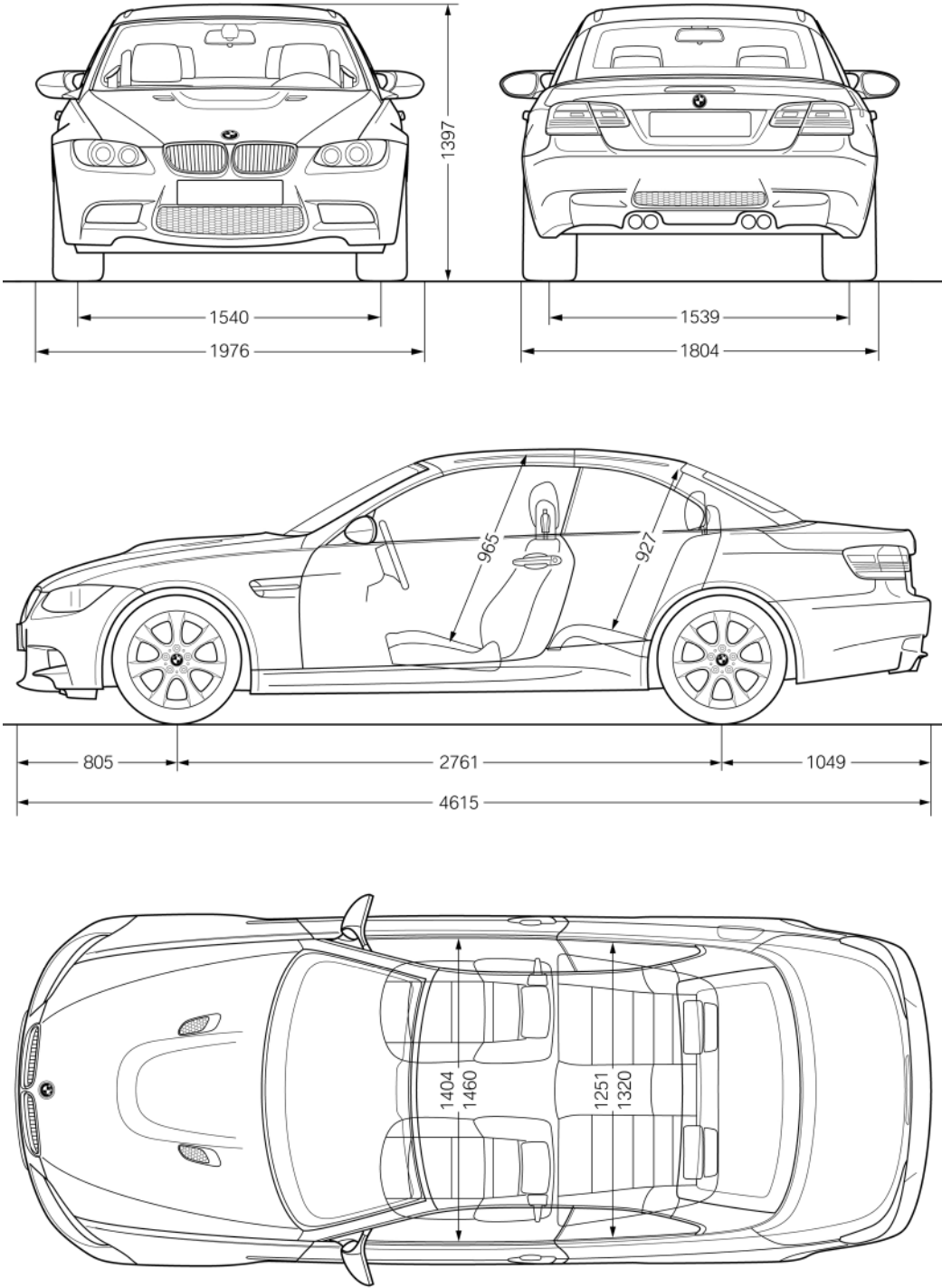
Exterior dimensions closed.



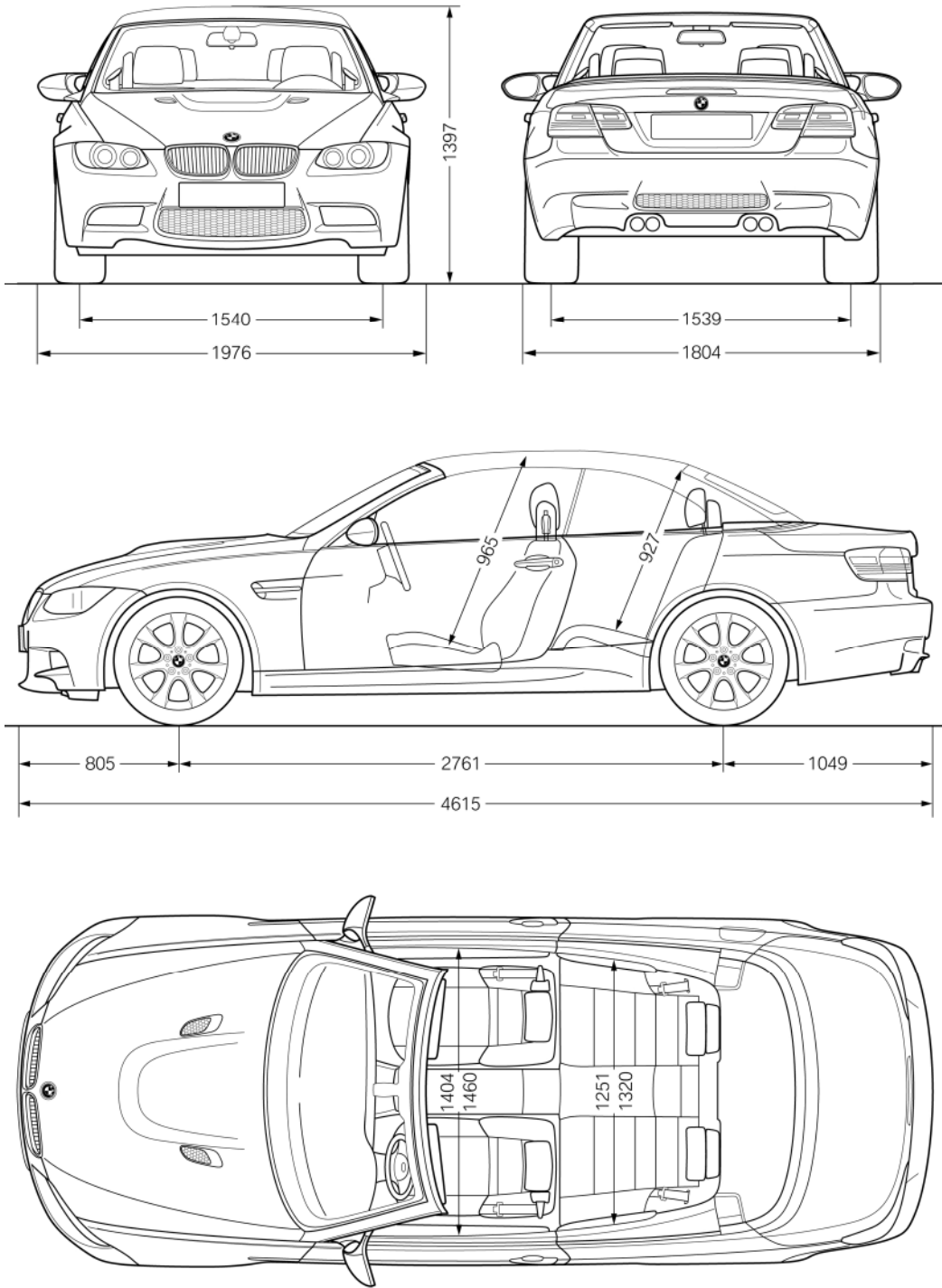
Exterior dimensions opened.



Interior dimensions closed.



Interior dimensions opened.



5. Output and Torque Diagram.

