

# The new BMW M3. Contents.



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# 1. Description in Brief.



- Fourth generation of the BMW M3, absolutely unique high-performance sports car from BMW M GmbH with stand-alone design and technology, developed on the basis of the BMW 3 Series Coupé.
- Unique character and dynamic driving characteristics ensuring a leading position in this market segment, unique power-to-weight ratio thanks to intelligent lightweight engineering: 3.8 kg/hp.
- First road-going version of the BMW M3 with an eight-cylinder power unit, brand-new V8 displacing 4.0 litres and developing maximum output of 309 kW/420 hp at 8,300 rpm, maximum torque 400 Newton-metres/ 295 lb-ft at 3,900 rpm, maximum engine speed 8,400 rpm, optimum torque and thrust throughout the entire speed range.
- Individual throttle butterflies, double-VANOS variable camshaft control, Brake Energy Regeneration, engine 15 kg/33 lb lighter than the six-cylinder on the former model.
- Acceleration from 0–100 km/h in 4.8 seconds, top speed limited electronically to 250 km/h (155 mph), average fuel consumption in the EU test cycle 12.4 litres/100 kilometres equal to 22.8 mpg imp.
- Manual six-speed gearbox with integrated, temperature-related oil cooling, double-plate clutch optimised for mass inertia.
- MDrive setting and retrieving the driver's specific configuration of the engine control map, suspension and DSC management, as well as the Servotronic control map as an additional option.
- Brand-new chassis featuring specific, weight-optimised components and axle kinematics typical of BMW M for a highly dynamic driving experience, forged aluminium track control arms, compound high-performance brakes, optional Electronic Damper Control (EDC) with three freely selectable control maps.
- First production car in its segment with a carbon-fibre roof, carbon-fibre reducing the weight of the car and enhancing its agility by lowering the car's centre of gravity, carbon-fibre roof as a clear, highly visual sign of exclusivity and motorsport.

- Lightweight components developed specifically for the new BMW M3: bumper supports front and rear, lightweight through-loading between the luggage compartment and rear seat area.
- Authentic BMW M design highlighting the athletic look and stance of the car, aluminium engine compartment lid with its striking powerdome as a clear sign of supreme power and performance, characteristic front end with extra-large air intakes, powerfully flared wheel arches.
- Intake “gills” in the front side panels, M-specific side sills highlighting the car’s rear-wheel drive, discreet spoiler look reducing lift forces on the rear axle, roof in visible carbon-fibre, dual tailpipes typical of BMW M.
- High-quality, lavishly appointed interior offering a wide range of options for customisation, innovative colour and materials concept, four seats, BMW individual High-End audio system tailored to the car as an option, model-specific paint and equipment variants underlining the exclusivity of the new BMW M3.

## 2. Passion for Supreme Performance. The new BMW M3. (Short Version)



The concept looks back at a long tradition, the result is unique every time: For more than two decades, the BMW M3 has ranked alone as the epitome of ultimate dynamism derived directly from motorsport, a car offering powerful and superior aesthetics, as well as a truly incomparable driving experience. And now the new version of this high-performance sports car is ready to go – perfectly prepared to find the ideal line not only on the race track.

Like its predecessors, the fourth-generation BMW M3 sets new standards in technology and driving dynamics. And at the same time, like all high-performance models from BMW M GmbH, the new BMW M3 offers all the qualities required for everyday driving enjoyment of the highest calibre.

The new BMW M3 is based on the BMW 3 Series Coupé, but is nevertheless quite unique in its looks and technical features. The engine, for example, is an exclusive development precisely for this model, with the chassis, suspension and body all based consistently on the requirements of motorsport.

So leaving aside just a few components, the new BMW M3 is a brand-new car from the ground up. The aesthetic design of the body again typical of BMW M and the drivetrain technology conceived from the start for supreme performance – clear proof of the competence of the car development engineers at BMW M GmbH with their close ties to motorsport – spell out supremacy of the highest standard. In a nutshell, therefore, the new BMW M3 is a car built to be a winner, a car always able to prove its superiority also in everyday traffic.

### **Making its debut in the BMW M3: eight-cylinder power unit with 420 hp.**

The truly impressive “heart” of the new BMW M3 is the car’s brand-new eight-cylinder power unit in V-arrangement combining outstanding power and performance with unique dynamism. Displacing 3,999 cc, the new V8 develops maximum output of 309 kW/420 hp. Maximum torque, in turn, is 400 Newton-metres or 295 lb-ft at an engine speed of 3,900 rpm. And perhaps an even more impressive fact is that some 85 per cent of this maximum torque is available consistently throughout the enormous speed range of 6,500 rpm.

The new BMW M3 accelerates from 0–100 km/h in 4.8 seconds and has a top speed limited electronically of 250 km/h or 155 mph.

The eight-cylinder power unit owes its perhaps most striking feature to the high-speed engine concept again typical of BMW M: Maximum engine speed of 8,400 rpm gives the engine supreme thrust and torque at all times. This power is transmitted to the rear wheels via a six-speed manual gearbox in conjunction with brand-new final drive featuring BMW's Variable M Limited-Slip Differential.

Over and above the engine's specific output of 105 hp per litre, average fuel consumption in the EU test cycle of just 12.4 litres/100 kilometres (equal to 22.8 mpg imp) bears clear testimony to the supreme engineering that has gone into this equally supreme car.

**Know-how carried over from Formula 1 in production, construction, and the choice of materials.**

The engine block of the new eight-cylinder comes from BMW's light-alloy foundry in Landshut north of Munich, which also builds the engine blocks for the Grand Prix cars raced by the BMW Sauber F1 Team. The crankcase is made of a special aluminium-silicon alloy. It is both compact and extremely strong and torsionally resistant in its bedplate design.

Despite the two extra cylinders, the entire power unit is approximately 15 kg or 33 lb lighter than the six-cylinder engine featured on the former model.

The V8 power unit of the new BMW M3 is equipped with variable double-VANOS camshaft control, a unique technology reducing losses in the charge cycle and thus improving power and torque in the process. Responding extremely quickly to the driver's commands, double-VANOS improves the spontaneity of the engine at all times, thus also helping to reduce fuel consumption and exhaust emissions.

The engineers at BMW M have developed a low-pressure version of double-VANOS specifically for the new eight-cylinder, operating at the regular operating pressure of the engine's oil circuit.

A further feature of the new power unit is the use of eight individual throttle butterflies giving the engine a particularly smooth and sensitive response throughout the entire speed range and enabling the driver to call up the superior power of the engine directly and smoothly at all times. A volume flow-controlled pendulum-slide vane pump supplies the eight-cylinder with lubricating oil, the amount of oil delivered to the engine always being geared precisely to what the engine needs at the given point in time.

Wet sump lubrication optimised for driving dynamics, finally, ensures an adequate supply of oil to the power unit even in extreme braking manoeuvres and under high centrifugal forces in a fast bend.

### **New engine management and Brake Energy Regeneration.**

Yet another new development is the electronic management of the V8 power unit integrating the clutch, gearbox, steering and brake functions tailored specifically to the requirements of a BMW M Car. And then, as a further highlight of engine management, ion flow technology serves to detect any tendency of the engine to knock as well as misfiring and mis-combustion.

Intelligent energy management featuring Brake Energy Regeneration enhances the efficiency of the power unit to an even higher standard: This new system generates electricity for the car's on-board network only in overrun and while applying the brakes, with the alternator generally being disconnected as long as the engine is in traction, "pulling" the car.

Apart from particularly efficient generation of electric power, this process also helps to provide extra drive power when accelerating.

### **Lightweight suspension for optimum use of the engine's supreme power.**

While the chassis and suspension of the new BMW M3 is based in its fundamental configuration on the suspension already featured in the BMW 3 Series Coupé, nearly all components are brand-new and unique. The objective in developing and introducing these new components was not only to significantly increase drive forces, but also to save weight to the greatest possible extent. Precisely this is why nearly all components on the double-arm spring strut front axle are made of aluminium.

The five-arm rear axle also built in lightweight technology is likewise brand-new with the exception of just one track control arm – ensuring a reduction in weight, as a result, of approximately 2.5 kilos.

The engineers and suspension specialists at BMW M GmbH have even succeeded in saving weight on the high-performance brake system with its compound discs. And last but certainly not least in this context, the new final drive on the BMW M3 features BMW M's Variable M Limited-Slip Differential generating locking forces of up to 100 per cent whenever required to provide optimum traction even in the most challenging situations.

The lightweight suspension is supplemented by Servotronic steering with steering assistance geared to the speed of the car, a high-performance brake system with vented discs all round, and electronically masterminded Dynamic Stability Control (DSC). As an option, finally, the new BMW M3 is also available with Electronic Damper Control (EDC).

### **MDrive button for the driver's personal style of motoring.**

With the newly developed suspension of the BMW M3 offering the ambitious driver excellent qualities right from the start, the sports-minded driver is able to customise the car specifically to his very own style of driving with the help of electronic suspension control. Hence, he – or she – is able to configure numerous dynamic driving parameters in the new BMW M3 to his personal preferences.

Available as an option, MDrive allows the driver to choose his pre-selected configuration simply by pressing a button. One example is the option to completely deactivate Dynamic Stability Control, another is to pre-select the level of Servotronic steering assistance via the iDrive control concept. This gives the driver the choice of two control maps varying power assistance of the steering according to the speed of the car in either the Normal or Sports mode.

Adjusting damper forces in order to optimise the car's driving dynamics also in bends, when applying the brakes and accelerating, Electronic Damper Control comes with a choice of three programs selectable at the touch of a button. Three control maps are also available for engine management, influencing not only the position of the throttle butterflies in the intake manifold, but also other parameters crucial to the response of the engine.

The result of the thorough work done by BMW M's chassis and suspension specialists in terms of both electronics and mechanical systems comes out clearly not least on the stopwatch: The new BMW M3 is significantly faster on a race track such as the **Nordschleife** – the Northern Circuit – of Nürburgring, which sets the benchmark for all cars from BMW M GmbH, than the former model.

### **Specific design highlights accentuating the car's unique technology.**

Following the proven tradition of BMW M GmbH, the Company's engineers and other specialists have developed the new BMW M3 as a fundamentally unique vehicle. And just how consistent they have been in taking this approach is borne out clearly from the start by the body of the car: Proceeding from the dimensions and basic design of the BMW 3 Series Coupé, nearly all body elements have been newly developed and designed from the ground up.

So apart from the actual structure of the car, only the doors, the luggage compartment lid, the windows, as well as the front and rear lights have been carried over from the BMW 3 Series Coupé, while all other components were specifically designed from the start for the BMW M3.

As a result, the exterior of the new BMW M3 clearly shows its unique power and superiority right from the start through its very aesthetic and appealing look. In the process the designers have developed virtually all components and features according to the principle that “form follows function”, opting for components which not only emphasise the supreme sportiness of the car, but also fulfil a definite technical purpose.

Typical examples in this context are the lightweight long-fibre thermoplastic carriers beneath the bumpers front and rear. Developed specifically for the new BMW M3, these components fulfil all crash safety requirements and enable the bumpers to retain their usual shape without any dents after a minor accident. A further advantage, quite obviously, is the reduction of weight by approximately 6 kg or 12 lb.

The front end of the car is another example of the function-oriented design and distinction of the BMW M3: While the bi-xenon dual headlights with their characteristic corona rings as a daytime light function are the same as the light units on the BMW 3 Series Coupé, the air intake scoops are significantly larger, providing a greater supply of intake and cooling air to the eight-cylinder power unit. And the engine compartment lid with its striking powerdome extending over the V8 power unit, together with its two additional air intakes, is also a specific feature typical of BMW M.

Further highlights exclusive to the new BMW M3 are the powerfully flared wheel arches, the narrow air slits in the front side panels, the side-sills highlighting the car's rear-wheel drive concept, and the rear panel with its aerodynamically highly efficient diffuser. And last but again not least, both the exterior mirrors and the 18-inch light-alloy rims come in typical BMW M design.

**Exclusive in this segment: roof in visible carbon-fibre look.**

Hardly any other component on the body of the new BMW M3 expresses the car's cutting-edge technology as clearly – and, above all, as visibly – as the roof made of carbon-fibre-reinforced plastic (CFRP). As visible proof of this new technology, the roof stands out intentionally through the fibre structure of this Formula 1 material, only a layer of clear paint covering this high-tech surface.



Apart from this exclusive look, the CFP roof – again applying the principle of form follows function – also offers a significant technical benefit, being a lot lighter than a steel roof. This not only reduces the overall weight of the car, but also saves weight where it really counts, on the highest point of the body, thus significantly lowering the car's centre of gravity and optimising driving behaviour particularly in fast bends.

The dynamic body design of the new BMW M3 is also expressed by special colours and highlights in the car's paintwork: In addition to four standard colours, four new M metallic paintwork colours exclusive to the new BMW M3 are available to the connoisseur, highlighting the contours and proportions of the car's body and offering a particularly unique look in the process.

### **Exclusivity and dynamics also within the interior.**

Through its particular look and design, the body of the new BMW M3 impressively symbolises the outstanding performance and sporting qualities of the car. The interior supplements this particular flair, seeking to offer the driver the ultimate experience at the wheel and giving all the car's occupants a perfect ambience tailored to their wishes and requirements.

Many of the interior design features thus stand out from the interior of the "regular" BMW 3 Series Coupé, with these distinctions being presented clearly from the start by the door cutout strips proudly bearing the M logo. The front seats, in turn, are optimised through their side support for a sporting style of motoring, while supreme craftsmanship and a perfect finish all round again serve to enhance the car's sporting design.

The dual round instruments typical of BMW – the speedometer and fuel gauge as well as the rev counter and oil temperature gauge – are all finished in specific BMW M design. The numbers on the instruments thus stand out in white from the black background, the needles in the traditional red of BMW M GmbH are particularly clear and easy to read.

Yet a further feature typical of a BMW M Car is the variable warning field in the rev counter informing the driver while the engine is warming up of the speed at which he can run the engine as a function of the current oil temperature: The borderline between the yellow pre-warning area and the red warning zone moves up consistently as a function of engine oil pressure, finally reaching its highest point at 8,400 rpm.

### **Control Display serving as the information centre.**

Available as an option, the Control Display comes right in the middle of the dashboard within perfect sight for both the driver and front passenger. The colour display presents information relevant to the driver as well as the current function of the car's communication, navigation, entertainment and air conditioning systems clearly and visibly whenever required.

The driver masterminds the system by way of iDrive, with the Control Display also serving to present a clear, easy-to-read map when using the optional navigation system.

The middle section on the instrument panel also housing the controls for the audio system and air conditioning extends down between the front seats within the newly designed centre console oriented in its entire geometry discreetly towards the driver. The upper side of the console is finished in black leather on all interior and equipment variants, with the side facing towards the driver comprising three important function switches (Power, DSC off, and, as an option, EDC) for activating or deactivating the car's electronic driving programs.

The iDrive control system with its Controller positioned right in the middle of the centre console comprises the additional MDrive menu level, the optional MDrive button serving to activate the set-up of the car entered by the driver in advance being positioned together with the remote control buttons for the audio system and mobile telephone on the spokes of the M leather steering wheel.

### **High-quality leather and BMW Individual High-End audio system.**

The four seats of the new BMW M3 offer both the driver and passengers superior comfort on long distances and excellent side support in fast and dynamic bends.

The rear seat bench made up of two individual seats comes complete with lightweight through-loading developed especially for the BMW M3 and available as an option with a removable ski-bag. Using long-fibre-reinforced plastic on the through-loading, the car's designers and engineers are able to offer the same function as usual with a weight-saving of approximately 7 kilos or just over 15 lb.

With its capacity of 430 litres or 15.05 cubic feet, the luggage compartment offers all the space required for convenient long-distance travel in an outstanding high-performance coupé.

The “basic” upholstery on the seats is a combination of cloth and leather, while the discerning customer also has the choice of all-leather upholstery in four different colours. An extended option is to choose leather upholstery also on the lower section of the instrument panel, the cover on the glove compartment, and the side panels on the centre console. Four exclusive trim strips extending across the entire dashboard from one side to the other beneath the Control Display and instrument cluster offer further options in customising the new BMW M3.

The new BMW M3 comes as standard with a high-quality audio system, and various navigation systems, the mobile BMW Online internet portal, the BMW Assist telematics service, as well as BMW TeleServices for wireless communication of service data to the driver’s BMW Service Partner are all available as options.

As yet a further option the new BMW M3 may also be fitted with the BMW Individual High-End audio system specially developed by BMW M GmbH and offering the occupants a truly outstanding experience in sound tailored specifically to the acoustics of the car.

**BMW M3 all the way – a high-performance sports car perfect for everyday use.**

From the 309 kW/420 hp eight-cylinder power unit all the way to the unique BMW Individual High-End audio system, all components of the new BMW M3 are conceived, designed and built for supreme performance. And at the same time they are simply ideal for providing sheer driving pleasure at all times and under all conditions, with the driver and passengers of the BMW M3 being able to enjoy the qualities of the car both on the race track and in everyday motoring.

Accordingly, the new BMW M3 is the perfect car for the all-round enthusiast wishing to express and live out his or her passion for performance not only in exceptional situations. Within the model portfolio of BMW M GmbH, therefore, the new BMW M3 is a particularly authentic expression of the unique philosophy which underlies the letter M.

The BMW M3 clearly comes in the tradition of BMW’s highly successful motorsport models, but is equally suited for the challenges of everyday driving. With its unpretentious, but nevertheless powerful and aesthetic looks, this is a genuine sports car dedicated to supreme performance without unduly flaunting its potential. So in summary, the new BMW M3 is the ideal interpretation of a high-performance sports car also suited in full for everyday use. A car with only one objective wherever you go: to offer you the ultimate driving experience.



### 3. Concept: Technology from Motorsport, Aesthetic Beauty for Everyday Motoring.

- **Sporting success as the underlying feature of all models from BMW M GmbH.**
- **Know-how from Formula 1 applied consistently in the V8 power unit of the new BMW M3.**
- **Superior understatement as an expression of true concept harmony.**

The new BMW M3 is the latest product to be introduced by BMW M GmbH, an exclusive specialist carmaker which has been hitting the headlines worldwide for 35 years through its fascinating cars on the race track. And this heritage based on motorsport naturally goes directly into each and every model built for the road. Supreme driving dynamics and performance, therefore, are the result of comprehensive know-how permanently enhanced in sporting competition and substantiated time and again by success on the race track.

The concept of developing high-performance cars with racing-based dynamics for uncompromising driving pleasure of the highest technical standard in everyday motoring comes to bear particularly in the BMW M3. Impressive wins on the race track characterise the history of this sports car based on the BMW 3 Series, just like consistently increasing sales figures.

The first generation of the BMW M3 launched in 1986 created a brand-new car segment never seen before. And while in the meantime this segment has become even more popular, with a number of competitors seeking to gain a foothold in this part of the market, the BMW M3 now entering its fourth generation remains a unique model of success thanks to the sum total of its many features and fortes.

#### **Newly developed eight-cylinder power unit with DNA carried over from Formula 1.**

The appeal and thrill emanated by BMW M Cars hail to a large extent from the unique character and performance of the respective power units. And the secret of BMW M Power now already a legend for a long time is BMW M's high-revving natural-aspiration engine technology: High engine speeds combined with appropriate gear ratios ensure maximum thrust and power, thrilling torque and a wonderful engine sound.

The origin of this drive concept is Formula 1: Right from the start, even the very first four-cylinder power unit featured in the first BMW M3 shared the same engine block as the power unit which enabled Brazilian racing driver Nelson Piquet to clinch the Formula 1 World Championship in his BMW Brabham. And the straight-six power unit featured in the second (starting in 1992) and third (as of 2000) model generation of the BMW M3, initially displacing 3.0, subsequently 3.2 litres, revved much faster than comparable engines in the segment, giving the BMW M3 incomparable power and performance characteristics. Indeed, at the engine's maximum speed of 8,000 rpm, the pistons moved almost as fast as in a Formula 1 power unit at the time.

Considering all of these qualities, it is no surprise that the eight-cylinder power unit of the new BMW M3 has a close relation proved and tested to the extreme: the V8 Formula 1 power unit raced by the BMW Sauber F1 Team.

The brand-new engine featured in the new BMW M3 replaces its straight-six predecessor lauded several times as the "Engine of the Year". And the specifications of this new high-performance engine are truly amazing in every respect – 309 kW/420 hp, maximum torque 400 Newton-metres/295 lb-ft, maximum engine speed 8,400 rpm – clear proof that BMW M has found an outstanding and fascinating successor to the former winning engine.

### **Production of components with know-how carried over from Grand Prix racing.**

This competence goes into many areas and activities of series production. On account of the specific demands made of the BMW M model series, the Company's engineers and other specialists have created numerous innovations in technology paving the way also for other cars within the BMW range. Indeed, the creativity of the engineers at BMW M GmbH is a clear synonym of the innovative power demonstrated by the BMW brand as a whole.

In their work the specialists at BMW M GmbH are able to use all the freedom they enjoy as a quick and highly responsive development team. Accordingly, BMW's light-alloy foundry in Landshut makes not only the engine blocks for the BMW Sauber F1 Team's Grand Prix racing cars, but also the block for the eight-cylinder featured in the new BMW M3.

### **Serving as the benchmark: the Nordschleife of Nürburgring.**

It almost goes without saying that the new BMW M3 proudly takes up a heritage which accounts, inter alia, for the outstanding success of the BMW M1 back in 1978, the Formula 1 World Championship won by BMW Brabham in 1983, the driver's titles in the World Touring Car Championship (1987, 2005, 2006), in the German Touring Car Championship DTM (1987 and 1989), and for outright victory in the 24 Hours of Le Mans (1995). For it was precisely in those years that the BMW M3, winning numerous national and international titles, became the most successful touring car the world has ever seen. The last winner in the guise of the former model was the BMW M3 GTR winning the 24 Hours of Nürburgring twice in a row (2004 and 2005).

Nürburgring and, in particular, the Nordschleife or Northern Circuit more than 20 kilometres in length, also plays a decisive role for the development specialists at BMW M GmbH over and above the Company's racing activities. Because it is a fundamental rule of BMW M GmbH and the responsible development engineers to test all new developments on this ultra-demanding race track in the German Eifel Mountains acknowledged by virtually all professional drivers the world over as the most challenging and difficult race track in the world. Supported by BMW M GmbH's Test Centre at Nürburgring evaluating the data obtained from A–Z, the development engineers of BMW M GmbH have already covered more than one million test kilometres on this extremely demanding circuit.

Being tested at Nürburgring, BMW M Cars are required to complete a particularly gruelling test regime, having to prove their racing qualities virtually all the time. On the **Nordschleife** they receive the fine-tuning and set-up of their chassis and drivetrain, that is the "soul", as it were, so typical of a BMW M Car. The suspension, springs, steering, brakes and electronic driving dynamic systems are all geared to the special character of a BMW M Car in every respect, since this is the only way to give the cars – and, of course, the driver – the agility you wish to enjoy in motorsport.

The **Nordschleife** of Nürburgring has thus become the benchmark for genuine progress in technology. And the obvious commitment fulfilled by the engineers at BMW M GmbH is that the new BMW M3 must significantly outperform the already very fast lap time of its immediate predecessor.

### **High-performance athletes in a supreme, aesthetic look.**

Technical perfection and a beautiful, aesthetic look full of character are linked inseparably in the eyes of the development engineers at BMW M GmbH. So working hand in hand, the engineers and designers focus on solutions combining form and function to provide a complete work of art. The understatement so typical of BMW M is thus created by the concept harmony of the car fulfilling the greatest and most exacting demands. Precisely for this reason all aerodynamic components are specially designed not only for their function, but also for a highly attractive, aesthetic look.

Like its predecessors, the new BMW M3 intentionally does not stand out through any kind of opulent spoilers. Indeed, the only reminiscence to the race track is the small spoiler lip on the luggage compartment cover referred to by the specialist as the "Gurney flap" serving to enhance the extremely effective aerodynamics of this high-performance sports coupé ensured by the well-conceived design of the car's body and the underfloor perfected to the last detail.

Exclusive materials such as carbon fibre-reinforced plastic on the roof of the new M3 contribute to the unique character of a BMW M Car. The carbon roof finished in its typical "visual" look and covered only by clear paint sets an optical highlight, with the focus nevertheless on its functional benefits. This remarkably light material thus makes a significant contribution in optimising the overall weight of the car and at the same time lowering the centre of gravity. Hence, weight saved in the roof area has a particularly positive effect on the supreme agility of the new BMW M3.

### **Power and character: a combination typical of a BMW M Car.**

The new BMW M3 is the ideal car for the genuine enthusiast wishing to experience the supreme potential of the ultimate driving machine not only in exceptional situations, but rather day-by-day. For this supreme two-door sports coupé offers motorsport performance combined with unrestricted everyday driving qualities. The unpretentious, aesthetic design of the body, the huge thrust and power of the new eight-cylinder power unit starting at low engine speeds, and superior suspension technology also offering adequate comfort all come together in the new BMW M3 to offer a particularly attractive rendition of understatement.

At the same time the new BMW M3 comes with an incomparable standard of all-round supremacy enabling the driver to enjoy a unique motoring experience without the slightest stress and hassle. The driving pleasure he or she will enjoy in the process also results from the car's enormous power reserves available directly and spontaneously at all times.

This superior power and thrust starting quite literally from the ground up and the unique free-revving performance of the engine form an ideal combination with the features of the chassis, Electronic Damper Control (EDC) available as an option automatically adjusting to new requirements also in the Comfort mode, with damper forces instantaneously being set to the requirements of the fast driver under dynamic driving conditions.

Benefiting from this superior drivetrain and suspension technology, the new BMW M3 is comparable to an experienced performance athlete setting out in relaxed style but then, when the big moment comes, showing all his muscle and performance in a most convincing manner.

Given its dynamic driving potential, the new BMW M3 competes with the most exclusive thoroughbred sports cars in the market. So obviously, the expectations of the true enthusiast in the performance the BMW M3 has to offer are very great indeed – and the new BMW M3 meets this challenge in full not only on the race track, but also in everyday traffic, offering a truly unparalleled driving experience.

Unlike most other cars in this performance class, however, the new BMW M3 shows and offers all its abilities in genuine style, combining these qualities with all the additional strengths and features required in everyday traffic and with four comfortable seats, a generous luggage compartment, absolute reliability in every respect, and, last but certainly not least, aesthetic design full of class and style.

All this makes the new BMW M3 the ideal means of transport for the dedicated motorist wishing to combine passion for performance with unrestricted everyday qualities. And the way this combination becomes reality time and again is precisely what makes a BMW M Car so thrilling and convincing, now more than ever before in the guise of the new BMW M3.





## 4. Power Unit: The Thrill of a V8 – Muscle Machine with an Ideal Body.

- **Debut: eight-cylinder power unit displacing 3,999 cc and developing 309 kW/420 hp.**
- **Brake Energy Regeneration: more power on less fuel.**
- **High-tech carried over from motorsport: high-speed engine concept, double-VANOS, individual throttle butterflies, wet sump lubrication optimised for dynamic motoring, ion flow technology.**

An exceptional engine for an exceptional sports car: The V8 power unit featured in the new BMW M3 raises the standard of driving pleasure offered by this high-performance two-door from BMW M GmbH to an unprecedented dimension, thus providing a thrilling and convincing answer to the question frequently asked by genuine aficionados of genuine sports cars whether further improvement of this unique car was still possible at all.

For after 15 years and two complete model generations, the epoch-making six-cylinder lauded several times over as the “Engine of the Year” and developing maximum output in its final version of 252 kW/343 hp has found its successor.

The eight-cylinder power unit in the new BMW M3 offers more cylinders, greater engine size, more power, and higher engine speeds – which, in practice, means ever greater thrill of motoring right from the start. Indeed, the combination of this power unit and the unique concept of the new BMW M3 is truly fascinating in every respect.

The specifications of the new high-performance engine alone clearly confirm the enormous progress this changeover to a new engine has to offer: Engine capacity is 3,999 cc, maximum output 309 kW/420 hp at 8,300 rpm. Maximum torque of 400 Newton-metres/295 lb-ft is just as impressive as the top engine speed of 8,400 rpm.

Benefiting from this kind of power, the new BMW M3 literally rockets to the forefront right from the start, accelerating to 100 km/h in just 4.8 seconds and continuing to push ahead with all its power until the electronic control unit limits the top speed of this two-door sports car to 250 km/h or 155 mph.

Apart from this supreme performance and specific output of 105 hp per litre, average fuel consumption of just 12.4 litres/100 km in the EU test cycle (equal to 22.8 mpg imp) bears clear testimony to the engineering skill of the power unit specialists at BMW M GmbH.

### **Ideal dimensions for optimum performance.**

Displacing 500 cc per cylinder, the new V8 power unit from the start comes with ideal engine dimensions just right for supremacy in technology, on road and track. And while a similarly powerful six-cylinder would simply not have had these ideal dimensions just right on a sports engine, the new V8 offers the very best in both theoretical and practical terms through its dimensions, filling capacities, the number of components and the weight of the engine.

At the same time the new eight-cylinder naturally comes with the specific features of BMW M such as double-VANOS, individual throttle butterflies and high-performance engine electronics. The number of cylinders, the M high-speed engine concept, and the low weight of the engine also prove quite clearly that the engineers at BMW M GmbH were inspired from the start by the eight-cylinder powering the BMW Sauber Formula 1.

Indeed, the new engine has many features in common with the latest power unit by BMW Sauber in Formula 1, sharing a number of principles in technology, production methods and materials all carried over from Formula 1 to the new BMW M3.

One important difference, however, will always remain: The BMW M3 is not pushed to the limit only occasionally on a racing weekend. Instead, its high-performance engine runs smoothly and reliably every day, on all roads and in all kinds of weather – and this it does for years of consistent motoring.

### **High-speed engine concept for unparalleled thrust.**

In its specific output, the new V8 significantly exceeds the mark of 100 hp per litre acknowledged as the decisive benchmark for particularly sporting and dynamic performance. But even so, power is not everything, since the experience of genuine driving dynamics depends to a large extent on the car's acceleration which, in turn, is largely influenced by the weight of the car and the thrust of the engine.

The thrust and power going to the drive wheels, in turn, is a function of engine torque and the overall transmission ratio. And it is precisely here that the M high-speed engine concept allows optimum gear and final drive ratios setting the basis in practice for truly amazing power and performance on the road.

Using these qualities, the engine development specialists at BMW M ensure that the spontaneity offered by the engine with its immediate response to the driver's commands fulfils all the demands made of a genuine M Car. So in its power potential, the way it offers superior torque and performance, in its dimensions and weight, the new V8 is most definitely a typical BMW M engine.

Focusing on the new BMW M3, the engineers at BMW M have raised the high-speed engine principle to a new dimension. Maximum engine speed is 8,400 rpm, maximum torque – the second factor crucial to the car's thrust and performance – is 400 Newton-metres or 295 lb-ft at 3,900 rpm.

A further significant point is that some 85 per cent of this maximum torque is available consistently throughout a huge speed range of 6,500 rpm, with no less than 340 Newton-metres or 251 lb-ft cutting in at just 2,000 rpm.

This clearly comes to bear in the performance and character of the new BMW M3 offering not only extremely dynamic driving characteristics but also all the fortes required for fast cruising on winding country roads or in city traffic.

#### **High performance, low weight.**

Weighing just 202 kilos or 445 lb, the new V8 is a genuine lightweight. In fact, it is approximately 15 kilos or 33 lb lighter than the six-cylinder in the former model, meaning that the lightweight technologies used on the engine easily set off the weight of the two extra cylinders. And a further point is that, through its design principle alone, the high-speed engine concept keeps the drivetrain light and allows very short gear ratios.

The fact nevertheless remains that increasing engine speeds bring the limits of extreme physics closer and closer: At an engine speed of 8,300 rpm – the speed at which the engine develops its maximum output of 309 kW/420 hp – each of the eight pistons covers a distance of no less than 20 metres or 66 feet, obviously with enormous loads acting on the materials and components. So for this reason alone, the engineers creating the new eight-cylinder attached maximum value to minimum moving masses right from the start.

#### **Engine block straight from BMW's Formula 1 foundry.**

The engine block of the new eight-cylinder comes from BMW's light-alloy foundry in Landshut north of Munich, which also builds the engine blocks for the BMW Sauber Formula 1 racing cars.

The new V8 is made up of two rows of four cylinders in a V-angle of 90° and with the two rows offset from one another by 17 millimetres or 0.67" to make the engine very compact. Piston stroke is 75.2 millimetres or 2.96" and bore is 92 millimetres or 3.62", adding up to a total capacity of 3,999 cc.

The crankcase is made of a special aluminium-silicon alloy, the cylinder liners being formed by exposing the hard silicon crystals, instead of using conventional liner sleeves. The iron-coated pistons therefore run directly in these uncoated, honed bores.

With high engine speeds and combustion pressure obviously causing tremendous loads on the crankcase, the entire crankcase unit is a particularly compact and torsionally stiff bedplate structure also in the interest of very precise crankshaft bearing. The relatively short, forged crankshaft, in turn, is likewise very stiff in terms of both flexural and torsional forces, but still weighs only about 20 kg or 44 lb.

Compared with conventional systems, the crossflow cooling concept featured on the new V8 significantly reduces pressure losses in the cooling system, spreading out temperatures smoothly within the cylinder head and thus reducing peak temperatures at all critical points. To ensure an optimum flow of coolant around each cylinder, the cooling liquid comes into the crankcase from the exhaust side, flowing crosswise through the cylinder head and above the collector rail on the intake side back to the thermostat and, respectively, the radiator.

### **Valve management by double-VANOS operating at engine oil pressure.**

Keeping valve timing extremely quick and short, variable double-VANOS camshaft adjustment optimises the response of the engine, reducing charge cycle losses and thus improving engine power, torque, fuel economy and emission management all at the same time.

Low-pressure M double-VANOS developed especially for the new eight-cylinder just requires normal engine oil pressure to keep valve timing extremely short and fast. The electronic engine "brain", in turn, sets the optimum spread angle to precisely the right ignition timing and injection volume as a function of load and engine speed.

### **Reliable oil supply even under extremely dynamic driving conditions.**

Being a very dynamic car capable of high speeds in virtually every situation, the BMW M3 requires a sophisticated, high-tech system to supply lubricant to the power unit. Accordingly, the engine lubrication system is able to operate without problems under straight-ahead and lateral acceleration of up to 1.4 times the normal g-forces of the earth, a volume flow-controlled pendulum-slide vane pump delivering lubricant reliably to the eight-cylinder at all times – that is precisely the amount the engine requires.

Wet sump lubrication optimised for a supreme level of driving dynamics ensures reliable lubrication even when applying the brakes under extreme conditions. The oil supply system features two oil sumps – a small one upfront of the front axle carrier and a large oil sump behind the axle. A separate reflow pump extracts oil from the front oil sump and pumps it to the rear.

**Eight single throttle butterflies masterminded electronically.**

Separate butterflies for each cylinder are the perfect solution not only in motorsport to ensure an immediate engine response at all times. So this is precisely why the new power unit of the BMW M3 features eight individual throttle butterflies, one for each cylinder.

Two actuators each control four throttle butterflies on each row of cylinders in a fully-electronic and ultra-fast process. This ensures sensitive response of the engine throughout the entire speed range and an immediate reaction of the car in response to the gas pedal, even when the driver requires maximum power.

**Flow-optimised air intake.**

To ensure spontaneous, dynamic performance of the engine, the throttle butterflies in the intake manifolds are positioned very close to the intake valves. The entire intake air flow within the eight-cylinder power unit no longer requires the conventional sensors incorporated in a hot film air mass flow meter, with engine load being determined instead by the electronic engine control unit – a significant advantage, since such conventional sensors are relatively complex and involve disadvantages in the geometric configuration of the air flow.

To determine load conditions in the engine, the control unit calculates the current load by taking the positions of the throttle butterfly and idle speed adjuster, the position of double-VANOS valve control, engine speed, air temperature and air pressure as the essential parameters. This gives the engineers new options and freedom in designing and optimising the engine air intake, and a further advantage is that this modern control concept offers maximum reliability at all times.

The charge effect generated in the oscillating tube is enhanced by the length and diameter of the intake funnels, the funnels themselves and the air collector being made of a light composite material with a 30 per cent share of glass fibre in order to reduce weight to a minimum.

### **Innovative exhaust system.**

Through its design and configuration, the exhaust system on the new V8 power unit optimises the charge cycle in the interest of maximum power and torque. Here again, the entire exhaust system is also designed and built for minimum weight, using the latest lightweight technology.

The exhaust pipes are made in an inner high-pressure moulding process, with the contours required on the stainless-steel pipes being shaped from inside under pressure of up to 800 bar. This method serves to provide pipes with extremely thin walls measuring only 0.65–1.0 millimetres in thickness, minimising flow resistance and weight, and optimising the response of the catalytic converters.

The exhaust gas is cleaned efficiently by four catalytic converters, ensuring that the engine fulfils the European EU4 standard as well as the US LEV 2 classification.

Noise emissions are also reduced to a sensible level, particularly the single-piece rear-end muffler with its very large volume of 35 litres serving to reduce the noise level, over and above the two intermediate silencers.

It almost goes without saying, however, that the new V8 power unit featured in the BMW M3 retains its exceptional sound and character, the eight-cylinder naturally offering a throaty sound typical of BMW M and reminiscent of motorsport.

### **Offering an even higher standard of performance: the engine control unit.**

The electronic control unit masterminding all functions of the V8 in the new BMW M3 is also a new development achieving an even higher standard than before. Taking more than 50 incoming signals, for example, the engine control unit determines the optimum ignition timing, the ideal cylinder charge, precisely the right injection volume and the accurate injection timing individually for each cylinder. At the same time, that is in a synchronised process, it calculates and sets the optimum camshaft spread and sets the eight individual throttle butterflies to precisely the right position. And as a further important factor, the control unit also supports the M-specific functions of the clutch, transmission, steering, and brakes.

Last but not least, the electronic engine “brain” performs a wide range of on-board diagnostic functions with various diagnostic routines for the workshop as well as further functions and all-round management of various peripheral units and components.

**An absolute highlight in engine management: ion flow technology.**

A particularly highlight in engine management is ion flow technology serving to detect engine knocking as well as misfiring and miscombustion.

Contrary to conventional procedures, this precise detection function is exercised exactly on the spot, that is in the combustion chamber.

This is done by sensing any possible knocking effect via the spark plug in each cylinder, with appropriate control of ignition timing.

The combustion process is also controlled at the same time, with the system detecting any misfiring or miscombustion. The spark plug therefore serves as an actuator for the ignition and as a sensor observing the combustion process.

The engine's electronic control unit then distinguishes between miscombustion and misfiring in a double function facilitating the diagnostic routine in engine maintenance and service.

**Brake Energy Regeneration for enhanced efficiency and driving dynamics.**

To enhance the efficiency of the entire drivetrain to an even higher standard, Brake Energy Regeneration, a new, intelligent energy management concept, concentrates the generation of electrical energy for the car's on-board network exclusively on periods when the car is in overrun or when the driver is applying the brakes. This serves to charge the car's battery without resorting to engine power and, accordingly, to the energy contained in the fuel consumed.

Generally, therefore, the alternator is disconnected and not in use while the engine is pulling the car in the traction mode.

Apart from particularly efficient generation of electrical energy, this also helps to improve the car's acceleration and power and ensures an even higher standard of driving dynamics.

With the number of charge cycles increasing on account of this intelligent management of the power generation process, Brake Energy Regeneration is combined with modern AGM Absorbent Glass Mat batteries able to handle far greater loads and tougher conditions than a conventional lead-acid battery. The particular advantage of an AGM battery is that it retains the acid required in microglass fibre mats between the individual layers of lead, thus ensuring long-term storage of energy even when charged and discharged frequently in the course of the battery's life.

## 5. Chassis and Suspension: Turning Superior Performance into Supreme Dynamics.



- **Front and rear axles reinforced but nevertheless lighter than before.**
- **Newly developed Variable M Differential for optimum traction.**
- **Electronic dynamic driving systems with optional customisation to the driver's requirements.**

Spreading out steering and drive forces on the front and rear axle, the new BMW M3 offers ideal conditions for supreme dynamic performance, very good directional stability and safe handling.

Indeed, the “regular” BMW 3 Series Coupé serving as the basis for the new BMW M3 provides the ideal configuration for a particularly agile high-performance sports car right from the start through its rear-wheel-drive concept. The fact remains, however, that the significant increase in engine power to 309 kW/420 hp on the new BMW M3 presented the chassis and development specialists with a number of new challenges. Once again, therefore, the task was to live up in full to the supreme standards of BMW M GmbH, with the chassis and suspension offering an ever greater dynamic potential than the engine.

Like their colleagues developing the power unit, the chassis and suspension specialists at BMW M GmbH therefore used their many years of experience in the construction of high-performance cars for this purpose, giving the new BMW M3 a chassis and suspension brand-new in nearly every respect and naturally taking the particular requirements of this high-performance model into account.

The objective in the development process was not only to match the qualities of the chassis and suspension to the outstanding power and performance of the eight-cylinder power unit, but also to save weight wherever possible. Precisely this is why nearly all components on the double-joint front axle are made of aluminium – among them the even stiffer spring struts, the pivot bearings, the central subframe and an additional thrust panel beneath the engine serving to maximise the lateral stiffness of the entire front section. And the anti-roll bar constructed as a hollow tube likewise serves to optimise both the appropriate function and the weight of the suspension.



With the exception of one single track control unit, the components on the five-arm rear axle of the BMW M3 also built in lightweight technology are likewise brand-new from the ground up. The anti-roll bar at the rear, in turn, is also a hollow tube for reasons of optimum function and minimum weight. Together with the axle control arms in forged aluminium and the aluminium dampers, these technologies and light materials serve to reduce weight by approximately 2.5 kg versus the former suspension.

Enhanced directional stability on the rear axle – using, inter alia, two additional longitudinal arms – and appropriate axle kinematics ensure a high standard of driving dynamics suitably matched to the power of the engine. Indeed, the very dynamic performance of the new BMW M3 was even taken into consideration in the design and construction of the cover on the final drive, which comes complete with cooling fins in order to optimise the dissipation of heat.

### **Variable M Differential Lock for enhanced traction and driving dynamics.**

The new final drive on the BMW M3 features a Variable M Differential Lock ensuring a perfect response to any difference in speed between the right- and left-hand rear wheel and providing up to 100 per cent locking action in a fully variable process. Whenever necessary, therefore, the Variable M Differential Lock feeds more engine power to the wheel with better grip, thus ensuring optimum traction on all surfaces.

These benefits come to bear particularly on a fast mountain pass, where with a conventional system the inner wheel in a bend may easily start to spin due to the reduction of load forces. Accordingly, a conventional differential lock taking only torque into account might reduce drive forces more than required in an attempt to prevent the inner wheel from spinning.

By contrast, the Variable M Differential Lock, with its ability to detect the speed of rotation, controls locking action appropriately and individually as required under all conditions. Indeed, this solution provides ideal support, enhancing the positive qualities of rear-wheel drive to a new, unprecedented standard.

The new BMW M3 benefits from the Variable M Differential Lock also in its driving qualities in winter. With a conventional differential lock, the total amount of drive forces the wheels are able to convey to the road depends on the force conveyed by the individual wheel with the lowest frictional coefficient – which often means a significant limitation of traction on snow, gravel or ice. The speed-sensing Variable M Differential Lock, on the other hand, gives the car a decisive advantage in terms of traction even under very different frictional conditions, even ensuring in an extreme case that all the drive power is conveyed to the wheel with better traction and grip.

### **The compound brake system: light, powerful, reliable.**

The new BMW M3 features an appropriately large and powerful brake system with compound brake discs. The inner-vented, cross-drilled grey cast iron discs measuring 360 mm (14.2") in diameter at the front and 350 mm (13.8") in diameter at the rear are connected by cast-in stainless-steel pins to the aluminium disc carrier in floating arrangement. With this configuration significantly reducing the thermal loads acting on the brake discs, the service life and, in particular, performance of the discs is increased accordingly. A further advantage is that the configuration of this high-performance brake system allows a further reduction of weight.

The vacuum required for the brake power servo is generated by an electrically driven pump, an ongoing wear indicator enabling the driver to permanently monitor the condition of the brake linings, with a display in the cockpit informing the driver of their remaining service life. Clearly, this not only enhances the standard of driving safety on the road, but also avoids unnecessary service and maintenance.

The new BMW M3 comes as standard on light-alloy wheels in specific M design. The front wheels measure 8.5 x 18 inches and run on 245/40 low-profile tyres, the rear wheels are 9.5 x 18 inches in size and run on 265/40 tyres.

### **Servotronic with two manually preselected control maps.**

Benefiting from rear-wheel drive, the rack-and-pinion steering on the new BMW M3 remains free of drive forces. Steering qualities are enhanced by hydraulic Servotronic power assistance controlling steering forces as a function of road speed. The driver, in turn, is able to vary the degree of power assistance by means of iDrive control, choosing from two different control maps by activating either the Normal or the Sports mode.

The Sports mode retains the very direct feeling of feedback from the road, enabling the driver to steer the car with utmost precision also at high speeds on winding country roads. The Normal mode, in turn, ensures more comfortable steering assistance, enabling the driver to park the car, for example, much more easily and with minimum effort.

### **Latest generation of Dynamic Stability Control.**

It almost goes without saying that the driver of the new BMW M3 benefits from electronic dynamic driving programs whenever encountering the limits to driving physics: Dynamic Stability Control (DSC) permanently monitors driving conditions and, whenever necessary, intervenes individually in the wheel brakes and reduces drive power in order to stabilise the car. Inter alia, this serves to counteract any over- or understeer in bends.

Dynamic Stability Control comprises a number of additional functions such as the anti-lock brake system (ABS), anti-spin control (ASC) preventing the wheels from spinning on surfaces with reduced traction, a Start-Off Assistant preventing the car from rolling back when setting off on an uphill gradient, as well as Cornering Brake Control (CBC) preventing the car from spinning when applying the brakes in a bend.

A further advantage of DSC is that it compensates any fading of the brakes at extremely high temperatures by increasing brake pressure accordingly.

Enhanced to an even higher standard than before, DSC Dynamic Stability Control on the new BMW M3 now also comprises additional functions in the interest of driving safety. Whenever the system recognises that the driver is about to apply the brakes all-out, for example, it builds up pressure in advance in the hydraulic brake system and pre-loads the brake pads, gaining valuable time in the process and significantly shortening stopping distances.

Yet a further function of DSC is regular dry braking in the wet, ensuring that the brakes are applied even under such conditions without the negative effect of a layer of water on the brake discs.

### **Electronic Damper Control recognising the driver's particular style of motoring.**

As an option the dampers on the new BMW M3 may be equipped with EDC Electronic Damper Control adjusting damper forces in an electrohydraulic process and thus not only optimising vertical oscillation of the car under dynamic driving conditions, but also significantly reducing the car's dive and roll behaviour when applying the brakes and when accelerating. Equipped with EDC, therefore, the new BMW M3 is capable of far higher speeds in bends.

The response and behaviour of all dynamic driving programs is naturally geared to the supreme performance of the new BMW M3, with the various electronically controlled systems intervening appropriately as a function of the car's outstanding dynamic driving characteristics. A further point is that the driver is able to individually configure certain parameters as required, thus matching the reactions of the car to his personal wishes and preferences.

One example is that the driver is able to completely deactivate Dynamic Stability Control by means of a push button in the centre console, a function which enables the particularly ambitious sports driver to enjoy the full dynamic potential of the new BMW M3 under appropriate conditions. When driving this sports car on the race track, the dedicated driver thus has the option to go all the way to the most extreme dynamic limits, enjoying the thrill of an optimum power slide in bends.

The effect of Electronic Damper Control can also be varied according to the driver's individual wishes and preferences, offering the choice of three settings: Normal, Comfort, and Sports again selected simply by pressing a button on the centre console.

Clearly, EDC Electronic Damper Control on the new BMW M3 comes from the start with a particularly sporting and dynamic configuration permanently retained as long as EDC is in the Sports mode. Whenever a particularly dynamic set-up of the dampers is not required, on the other hand, the driver is able to switch to the Normal or Comfort mode.

In this latter case the dampers respond adaptively – and just as quickly and sensitively as usual – to any change in the driver's style of motoring. Then, as soon as higher steering angle speeds indicate that the driver is about to adopt a more dynamic style of motoring, damper forces are increased automatically, EDC switching to a damper control map comparable to the Sports mode regardless of the control map currently activated.

As a result, EDC offers perfect support in switching spontaneously from a more comfort-oriented style of cruising to a sporting and active style of motoring. Indeed, this intelligent management of damper systems ideally reflects the all-round character of the BMW M3 ensuring outstanding sports performance at all times.

Engine management likewise comes with three control maps again retrieved via iDrive. Apart from varying the position of the throttle butterflies in the intake manifold, these control maps also act on other parameters with a significant effect on the response and behaviour of the engine. And last but not least, iDrive also serves to program the Servotronic power assistance with the two Normal and Sports set-ups.

### **MDrive button for the ambitious driver.**

The iDrive control system may be further enhanced on the new BMW M3 by the addition of MDrive as an option. This gives the driver the opportunity to pre-select his personal setting on all dynamic driving systems which may be individually configured, thus choosing the perfect set-up of the car geared precisely to his personal preferences.

This individually defined configuration is saved in the system and may be retrieved immediately whenever required simply by pressing the MDrive button on the multi-function steering wheel, regardless of the system configurations previously selected by way of other function buttons.

This gives the driver of the BMW M3 the wonderful opportunity to enjoy the versatile character of his car in every respect and with all its facets – simply pressing one single button to change over to his personal set-up of the new BMW M3.

## 6. Design: The Expression of Perfect Concept Harmony.



- **Body design expressing a clear pledge to power and performance.**
- **Visible application of the “form follows function” principle.**
- **Driver-oriented cockpit, high-quality materials.**

The dynamic design and look of the new BMW M3 is characterised by the short front overhang, the voluminous wheel arches, a long wheelbase, the passenger cell moved far to the rear, the A-pillars raked to a low angle, the low-slung windows, and the roof line merging harmoniously into the rear end of the car. The entire body has a slight but distinct wedge shape, with perfect proportions of the sporting and sleek silhouette excellently finished to the last detail.

Boasting numerous features specific to BMW M3, the new BMW M3 enhances the powerful look of all the lines already so distinctive on the BMW 3 Series Coupé with its sporting and elegant appearance.

With the exception of the doors, the luggage compartment lid, the windows as well as the front and rear lights, all body elements have been re-designed for the new BMW M3. In this process the modifications seek consistently to accentuate the outstanding driving dynamics of the BMW M3 clearly but unpretentiously.

Given this philosophy, the two-door Coupé simply exudes agility and its dynamic driving potential from every angle. Applying the principle that “form follows function”, the designers at BMW M GmbH have implemented the philosophy in designing the body that a technical solution must always be reflected by authentic sporting design and looks.

### **Front end symbolising the potential of the eight-cylinder power unit.**

The differences between the “regular” BMW 3 Series Coupé and the new BMW M3 come out most clearly at the front end of the car: Three large air scoops below the radiator grille bear clear testimony to the greater demand for intake and cooling air of the eight-cylinder power unit.

Clearly, these air intakes are arranged and laid out exactly in accordance with the requirements of the engine and its ancillary units, extra-large openings serving to supply the normal-aspiration power unit with an ample flow of air. Precisely this is why the new BMW M3, like BMW M Cars in general, does not feature the foglamps fitted on the “basic” model. Large, vertical bars define the position and contours of the air intakes and enhance the characteristic design language of the car.

Made of aluminium, the engine compartment lid is dominated by a large centre “bulge”, the so-called “powerdome”. Together with the recesses next to this central section, the powerdome again bears clear testimony to the high potential of the eight-cylinder power unit within the engine bay. In its contours, the powerdome, together with the intake air scoops, takes up the arrow shape of the engine compartment lid and thus accentuates the lines of the car literally urging forward in a dynamic process.

Together with the double kidney grille again so typical of BMW, the low headlight units featuring bi-xenon dual headlights as standard round off the highly dynamic look of the BMW M3. The headlight units are cut off visually at the top to create the impression of a concentrated look extending out in front of the car. The corona rings integrated in the headlight units, in turn, may be used as daytime driving lights, giving the front end of the car its unmistakable character typical of the BMW brand also in the dark.

### **Silhouette with distinctive light and shade effects.**

The powerfully modelled front wheel arches on the new BMW M3 symbolise both supreme agility and driving stability all in one. Together with 18-inch light-alloy wheels in double-spoke design again typical of a BMW M Car, the large and muscular wheel arches highlight the particularly wide track of the car. And looking through the spokes, the connoisseur will immediately recognise the compound high-performance brakes developed exclusively for BMW M Cars.

The two front side panels are interrupted by another sign of distinction so typical of a BMW M Car referred to by the designers as the car’s “gills”. The carefully chiselled contours of these air intakes and side panels give the car an even more dynamic look from the side further enhanced by the lines extending along the body.

The chrome bracket separating the two sections and bearing both the stretched-out direction indicator as well as the logo of the BMW M3 again enhances the three-dimensional structure of this unique element.

Developed exclusively for the new BMW M3, the exterior mirrors also have an important aerodynamic function. These mirrors are characterised by the black-coloured double bar holding the mirrors in position and reminiscent in its design of the wings of an aircraft.

With their horizontal light edge and their specific shape tapering out to the end, the exterior mirrors not only emphasise the sporting character and look of the car, but also, through their shape and design optimised in the wind tunnel, help to further reduce the drag coefficient.

### **Clearly confirming the qualities of rear-wheel drive.**

The specific lines of the car with two areas merging into one another and forming the distinctively flared side-sills create a very dynamic flow of light along the side, giving the car an even lighter and more sporting look by making the side panel look lower. The side-sills, in turn, in their design, correspond with the shape and configuration of the powerfully contoured body line.

The so-called character line above the rear wheel arch forms an arch of tension both to the outside and up to the top. In addition, the light-and-shade contrast builds up additional excitement and generates a further sign of power on the rear side panel and the wheel.

Both of these affects guide the eye of the beholder to the rear axle, emphasising the significance of rear-wheel drive in contributing to the outstanding performance of the new BMW M3. And last but not least, the character and sill line form an ellipse moving to the front, again emphasising the forward-pushing power of the car.

### **Rear-end design adding a further touch of power.**

On account of its very special proportions, the new BMW M3 also offers a particularly superior and muscular look from the rear. The design of the car at the rear takes up the design message and language already presented at the front, the side line dropping down gently towards the rear end and the wheel arches extending into a chiselled, almost “hollow” segment highlighting the rear-wheel-drive concept.

The entire rear end of the car looks low and wide, visualising the superior dynamics and powerful stance of the new BMW M3 on its wheels. And last but not least, this superior effect is further enhanced and supported by the high-tech rear light clusters complete with LED light rods.

A discreet spoiler lip on the lid of the luggage compartment serves to optimise the car's streamlining, further reducing lift forces on the rear axle without in any way interrupting the discreet look of the rear end.

The contours of the split diffuser beneath the bumper with its chiselled bars once again take up the special shape and design of the air intake scoops at the front. The air guide duct and the dual tailpipes positioned far towards the centre axis of the car serve to visually contract the rear end in the lower middle segment, building up captivating optical tension versus the horizontal lines of the rear bumper. And as yet another feature typical of a BMW M Car, the four tailpipes are circular and cut off straight at the end.



### **Roof made of carbon-fibre-reinforced plastic.**

In creating the new BMW M3, the designers of the car focused from the start on the purist principle of “form follows function” particularly in the case of the roof – perhaps more so than with any other component.

Made of carbon-fibre-reinforced plastic (CFP), the roof serves to reduce the overall weight of the car by approximately 5 kilos, at the same time, through its visible material structure, underlining the high-tech claim of the entire car as a whole.

Using this special material originally used in aerospace and now to be seen in many high-tech sports ranging from Formula 1 all the way to the America's Cup, the designers and engineers responsible for the new BMW M3 have succeeded in further lowering the car's centre of gravity. Indeed, this reduction of weight is at a particularly important point – at the highest point on the body – and therefore has a particularly positive effect on the car's driving dynamics.

The CFP roof is intentionally only covered by clear paint, keeping the structure of the carbon-fibre tissue clear and visible. A further point is that the darker look of the roof seen from the side makes the roof pillars look lower, thus optically reducing the height of the car.

The production method developed specifically for the CFP roof is currently used exclusively by specialists at the BMW Plant in Landshut north of Munich. Originally, this cutting-edge technology was conceived for the production of cars sold only in limited numbers or special editions. Now, thanks to the unique know-how of the production engineers at BMW Plant Landshut, there are new options in the use of CFP, allowing the use of this material on the roof of the new BMW M3 in far larger numbers.

### **Exclusive body colours highlighting the car's dynamic design.**

The new BMW M3 is available with a choice of four model-specific M metallic paintwork colours strongly accentuating the contours and proportions of the body in a particularly powerful look. With its light shimmer, for example, Melbourne Red combines supreme brilliance and particular depth of colour. Jerez Black, on the other hand, featuring blue pearl pigments, also offers highly interesting surface effects. And the more powerful Interlagos Blue, including red colour pigments, provides a highly attractive interchanging effect into the colour violet.

A colour already well known from the BMW M5 and BMW M6 is Silverstone, a light silver with a slight touch of blue. The new BMW M3 is also available in Alpine White and Black, two colours carried over from the BMW 3 Series Coupé, as well as the two metallic colours Sparkling Graphite and Space Grey. So depending on the customer's choice, these body colours highlight either the technical and sporting character or the more supreme and elegant appearance of the car.

### **Dynamic design also within the interior.**

The athletic lines of the exterior naturally continue within the interior, powerful contours and flowing lines accentuating the concave and convex surfaces surrounding the four seats. The horizontal lines dominating the instrument panel and the harmonious surfaces on the side panels give the interior a particularly dynamic touch.

The interior of the new BMW M3 stands out clearly on a number of essential points from the "underlying" BMW 3 Series Coupé: Right from the start, when getting into the car, the door cutout strips with the M logo highlight the unique and independent character of the new BMW M3. Then there are the dual circular dials typical of BMW – the speedometer and tank gauge as well as the rev counter and all temperature gauges – finished in specific M style, and visualising the dynamic potential of the eight-cylinder power unit. The numbers on the dials stand out in clear white from the black background, the needles in the traditional red of BMW M GmbH are particularly clear and easy to follow.

The cockpit control area is between the front seats within a newly designed centre console which, in its entire geometry, sweeps discreetly around the driver and extends all the way to the rear seats. In all versions of the new BMW M3 the console is finished in black leather, continuing the instrument surrounds and operating area in the right colour and in a harmonious, smooth design.

### **Colour scheme supporting the driver orientation so typical of BMW M.**

Apart from the clear design and optimum ergonomic arrangement of all controls and instruments, the choice of colours inside the new BMW M3 is ideally suited to help the driver concentrate on the traffic around him and the driving experience. Regardless of the interior colour the customer happens to choose, the footwells and parcel shelf as well as the upper section of the instrument panel come in dark anthracite. As an additional feature, the dark roof lining and the dark covers on the A-pillars also accentuate the driver orientation so typical of a BMW M Car.

The dark colour scheme around the windscreen also helps the driver concentrate in full on traffic conditions, while the colours surrounding the front and rear passengers likewise enhance the experience of driving a genuine, thoroughbred sports car.

**High-quality touch rounding off the experience on board.**

An exclusive feeling of top quality adds the final touch of perfection to the sporting ambience inside the car. And indeed, the designers have given great attention to the use of high-quality materials and a perfect finish in true craftsmanship.

A double-stitch seam highlighting the demanding standard of production separates the upper section of the door and side panels when featuring optional leather upholstery from the other parts of the interior finished in the regular interior colour. Controls and instruments the driver and perhaps also the front passenger will touch particularly often, such as the switches and buttons for the air conditioning or the door openers, are highlighted in a particularly sophisticated and classy metal finish.

Within the interior of the new BMW M3 the designers have likewise given their utmost attention to a beautiful surface touch so essential to the sensual perception of a car. So through the materials chosen, they round off the premium experience on board the new BMW M3 characterised by outstanding quality in both design and finish.

## 7. Body, Safety, Model Features: Uncompromising Driving Pleasure of the Highest Standard.



- **Top performance also in occupant protection.**
- **Seat upholstery made of leather all round, interior lights package and genuine wood trim.**
- **BMW Individual High-End Audio System for a perfect experience in sound.**

Featuring its high-performance eight-cylinder power unit, fading-free compound brakes, and modern dynamic driving systems, the new BMW M3 offers a truly exceptional standard of driving dynamics as well as supreme reserves in active safety.

The fascinating agility guaranteed by this two-door sports car ensures not only particularly dynamic, but also absolutely superior handling in every situation. Hence, the driver of the new BMW M3 is able to keep his car safely under control at all times even when venturing into new dimensions of driving dynamics – clear proof, again, of the mature overall concept of this high-performance driving machine.

Bi-xenon dual headlights ensure safe motoring in the dark, while the special corona rings around the headlights provide an ideal daytime light function: As soon as the driver activates the daytime driving lights, two light rings come on in the two headlight units, the inner ring being illuminated from within, the outer ring incorporating light rods to provide a particular touch.

This light effect creates that striking look so typical of a BMW and makes the car not only easily recognisable, but also quite unique as a genuine representative of the BMW brand.

As an option, the new BMW M3 is available with Adaptive Headlights, the headlights swivelling to the side as a function of steering wheel lock, the yaw rate and the speed of the car.

The big advantage of Adaptive Headlights is precise illumination of the road ahead in bends and on winding roads, significantly increasing the standard of safety when driving in the dark.

Two-stage adaptive brake lights – referred to as BMW Brake Force Display Lights – add a further improvement in driving safety helping to prevent accidents from the rear: Whenever the driver presses down the brake pedal particularly hard the brake lights come on over a larger area, giving motorists following from behind a clear signal and telling them to brake harder, too.

**Torsionally-stiff body as the foundation for superior occupant safety.**

The torsionally-stiff body structure as well as retention and belt systems activated electronically according to individual requirements ensure a high standard of passive safety and all-round occupant protection within the new BMW M3. The use of high-strength steel on the extra-large load-bearing structures, together with exactly defined crumple zones, guarantees appropriate absorption and diversion of impact forces in the event of a collision. The space available for deformation is thus used in full in order to avoid any damage to the passenger cell and keep the effects on the body of the car to a minimum even in a severe collision.

In a head-on collision deformation zones right at the front of the car keep the impact energy safely away from the bulkhead area and, accordingly, from the footwells. The specially designed floorpan, in turn, passes on the forces in a side-on collision to the opposite side of the car in a controlled process. The overall combination of the doors, reinforced B-pillars, the seat structure and the instrument panel between the A-pillars, finally, ensures maximum stability of the car's side structure.

Carrier profiles extending along the car from front to rear, various reinforcements and the solid construction of the luggage compartment floor, rear panel and side walls offer ample protection from the consequences of a rear-end collision. Stable pillars and crossbars, finally, keep the passenger cell intact and properly in form even in a rollover.

A further objective pursued from the start by the safety engineers at BMW M GmbH was to keep the need for repair after a minor collision to an absolute minimum. Precisely this is why the front side panels of the new BMW made of a special synthetic material are largely resistant to minor damage, the panels returning to their original shape after slight deformation. Collisions at very low speeds, for example when manoeuvring in a car park, therefore hardly leave any lasting traces.

### **Central electronic controls masterminding the car's restraint systems.**

The electronic restraint and safety systems in the new BMW M3 are matched perfectly to the ultra-strong structure of the body. No less than six airbags as well as belt latch tensioners and belt force limiters on all four seats are activated by the central electronic safety unit as a function of the type and severity of a collision.

Sensors right in the middle of the car, in the B-pillars and in the doors interact with the electronic safety unit to determine which safety feature offers optimum occupant protection in each case, with only those restraint and safety systems being activated that are really required.

The driver and front passenger are adequately protected by frontal airbags as well as hip thorax airbags housed in the seat backrests. These four airbags are activated in two stages, depending on the severity of a collision.

Through its size alone, the curtain head airbag protects the occupants both front and rear, the risk of leg injury in a head-on collision being reduced on the driver's side by predetermined deformation of the footrest.

Immediately after a collision the electronic safety system will again activate important functions, for example to warn drivers following from behind and facilitate rescue operations. The hazard warning flashers and interior lights, for example, are automatically activated, the central locking is opened, the alternator is switched off and the safety battery terminal released in order to avoid a possible short circuit.

In this case the hazard warning flashers and interior lights, as well as the emergency telephone function, are supplied with power by a separate connection to the on-board network. And last but not least, the fuel pump is deactivated in order to prevent uncontrolled spillage of fuel.

With its robust body and wide range of active and passive safety elements, the new BMW M3 has all the features it needs to fulfil the strictest safety standards and crash test requirements imposed by law the world over.

### **Sporting and stylish: high-quality materials and exclusive colour combinations within the interior.**

The new BMW M3 is available in three exclusive interior variants: The sporting, "basic" version is the Speed combination of cloth and leather. Newly developed, fully tanned Novillo leather is available as an option, exuding a particularly elegant and sporting touch with its smooth, velvety surface. Apart from classic Black, Novillo leather is available also in Palladium Silver, Bamboo Beige and Fox Red.

As a further, enhanced option, the interior may be finished in Novillo leather also around the bottom of the instrument panel, on the glove compartment cover, and on the side panels of the centre console.

Four exclusive trim versions with trim strips covering the entire width of the dashboard beneath the instrument cluster offer further opportunities to customise the new BMW M3.

The “basic” trim finish is in Titanium Shadow, with Alu Shadow and special leather with a carbon structure grain as well as fine-grain high-quality wood and plane wood dyed in Anthracite coming as options. Each of these trim variants gives the interior of the new BMW M3 its own very special look ranging from cool and technical all the way to sporting and elegant.

### **Highly effective air conditioning for a pleasant climate on board.**

Featuring an elaborate, high-tech venting, heating and air conditioning system, the new BMW M3 offers its occupants a high standard of touring comfort regardless of the outside temperature. The flow of air goes either directly or indirectly to the occupants from several air supply sources, guaranteeing highly effective and at the same time draught-free circulation of fresh air. A further feature is separate control of the air temperature on the driver's and front passenger's side.

Both the driver and front passenger are able to control the air conditioning, communication, navigation and entertainment functions by way of the iDrive management system complete with the Controller on the centre console.

The Control Display fitted precisely in the middle at eye level shows the status of the function currently in use, as well as further options in the respective menu or the graphic map of the optional navigation system.

### **Telematics services for all-round convenience.**

The Control Display also presents the information provided to the driver and his passengers by means of the BMW Online and BMW Assist mobile internet portal. Featuring an emergency call function, BMW Breakdown Assistance, the BMW Info information system, V-Info plus traffic information, and the mobility-based BMW Enquiry Service, BMW Assist offers a unique range of functions and benefits. A particularly practical advantage when travelling is the provision of information on hotels, restaurants or the cinema listings at the driver's destination.

One of the automated telematics services offered by BMW Assist is the emergency call function: As soon as an airbag is activated, this very helpful function immediately establishes a link to the Service Centre, a short message sent through the navigation system informing the Centre of the car's current location in order to organise rescue and assistance services without the slightest delay.

The V-Info plus traffic information system makes an important contribution to pleasant motoring free of stress and traffic congestion. It enables the driver to regularly retrieve the latest traffic information processed without delay by the navigation system in the new BMW M3 and used for calculating the best route.

Yet a further option is to prepare a forthcoming appointment for service and maintenance through BMW TeleServices, an innovative system for wireless transmission of service data to the driver's BMW Service Partner.

### **Cockpit with M leather steering wheel and driver footrest.**

The M leather steering wheel featured as standard is the perfect interface between the driver and his car. With its rim resting firmly in the driver's hands, particularly thanks to the thumb contours, the driver always remains fully in control, the steering wheel offering a perfect grip for precise steering movements.

The remote control buttons for the audio system and mobile telephone, and, as an option, for the MDrive function activating the car's set-up saved by the driver in advance are all positioned on the steering wheel spokes. And a further button may be freely programmed by the driver through iDrive for any particular function of his personal preference.

The newly designed and contoured front seats ensure optimum side support particularly with a sporting and dynamic style of motoring. The high standard of craftsmanship and seat finish, in turn, enhances the sporting design of the seats to an even higher level. An integrated footrest next to the clutch pedal gives the driver a firm support, while the side panels made of brushed stainless steel as well as the anti-slip cover in the middle highlight the sporting touch and function of the seats.

### **Interior lights package for a particularly exclusive atmosphere.**

Within the interior of the new BMW M3, light plays a particularly important role in creating an exclusive atmosphere. Indirect illumination comes from the start as a standard feature, while the optionally available Lights Package intensifies the experience of supreme illumination in a particularly emotional manner:



The Lights Package is made up of a trim bar extending along the door linings and the side panels at the rear in a gentle, sweeping motion throughout the entire length of the interior. This trim bar incorporates small spotlights emitting gentle light beams to the lower part of the interior to provide a particularly discreet and attractive lighting effect.

### **Two full-size seats at the rear.**

The new BMW M3 is laid out as a four-seater. Benefiting from seats in perfect ergonomics, all the car's occupants enjoy superior motoring comfort also on long distances and excellent side support in fast bends.

As an option both the driver's and front passenger's seat are available with backrest width adjustment in conjunction with an adjustable lumbar support. The centre console extending all the way to the rear, in turn, splits up the rear seat bench into two full-sized and highly comfortable seats also at the back, the low seat bottoms giving the rear passengers generous headroom at all times.

The rear seat bench comes complete with lightweight through-loading available as an option with an – also retrofittable – ski-bag. Made of a special synthetic material reinforced by long fibres, the through-loading developed for the new BMW M3 is approximately 7 kilos lighter than a standard through-loading system.

Offering no less than 430 litres or 15.05 cubic feet luggage capacity, the luggage compartment clearly proves that the new BMW M3 is also perfect for long-distance motoring. As an option the luggage compartment comes with a special Storage Package comprising features such as a bags holder and a baggage net. A 12-volt socket, in turn, enables the driver and his passengers to connect external electrical appliances such as a cooling box.

### **Nothing but the best: the BMW Individual High-End Audio System.**

The new BMW M3 comes as standard with a high-quality audio system. As an option, there is also the BMW Individual High-End Audio System developed by BMW M GmbH specifically and exclusively for this very special car. In this case no less than 16 high-output loudspeakers complete with Neodym magnetic drive and extremely stiff Hexacone diaphragms, a digital 9-channel amplifier with maximum output of 825 watt, and ultra-precise frequency bars guarantee unparalleled quality of sound.

A feature quite unique in the world of motoring is Dirac Live technology for signal processing. Dirac Live corrects the loudspeakers' impulse response and ensures linear, time-phased playback within the interior of the car.

The ultra-precise impulse in audio reproduction generated in this way gives not only the driver, but rather all occupants in the new BMW M3 an unusually versatile, dynamic and lively experience of sound. An optimum listening experience under all driving conditions is ensured furthermore by speed-related volume control and speed-related equalising.

The driver or front passenger are able to control the BMW Individual High-End Audio System by means of the iDrive Controller, with the further option to mastermind all basic functions and settings via the audio controls on the centre console, as with all the car's entertainment systems.



## 8. Production: Exclusive Quality Built in Flexible Production Friendly to the Environment.

- **Integration in one-line production at BMW Plant Regensburg.**
- **Powder clear paint: even greater brilliance, less chemicals.**
- **CFP roof: exclusive production at BMW Plant Landshut.**

The BMW Group's premium products are the result of a highly efficient production system based on mature and sophisticated job processes, ultra-modern technology, and the skills of highly trained employees.

The new BMW M3 is built for the world market at BMW Plant Regensburg, where the production of this new high-performance sports car once again underlines the great flexibility of BMW's production processes: Although each individual BMW M3 is tailored to the customer's personal wishes and requirements, and the carbon-fibre-reinforced plastic roof uses a high-tech material never seen before in large-scale production, the complete process of building the car is fully integrated into the course of production at BMW Plant Regensburg. The new BMW M3 is therefore built in a so-called single-line system together with other models such as the BMW 3 Series Saloon, Coupé and Convertible, as well as the BMW 1 Series.

### **High standard of flexibility and full integration into BMW's worldwide production network.**

Such combined production on one single line offers significant benefits, enabling the Plant to respond quickly to fluctuations in the market by adjusting its production figures. This, in turn, requires highly efficient production planning based on the consistent use of information technology.

A further important feature is that as many job and operation packages as possible are standardised, carefully planned logistics ensuring an optimised flow of the individual job processes. In the case of the new BMW M3, this means a significant increase in just-in-time and just-in-sequence operations versus the former model.

Yet a further point is that Plant Regensburg maintains numerous interfaces to the BMW Group's worldwide production network, receiving components such as the side panels of the new BMW M3 made of a special synthetic material from Plant Landshut, which also builds the roof in carbon-fibre. At Plant Landshut lightweight production experts build the roof out of several layers of this valuable high-tech material first pre-moulded in a dry process and then treated with resin in the RTM (resin transfer moulding) process, and subsequently finished in a special coat of clear paint.

BMW already produced a carbon-fibre roof in the past in a limited edition for the BMW M3 CSL. The next step was the production of a carbon-fibre roof for the BMW M6 in larger numbers, before moving on to the new BMW M3, with a further increase in production capacities to a volume quite unique with this kind of technology the world over.

### **Engine production using know-how from Formula 1.**

The crankcase for the 309 kW/420 hp V8 power unit of the new BMW M3 is also built in Landshut. The light-alloy foundry at BMW Plant Landshut is indeed a further example of the highly specialised and exceptionally efficient production processes within the BMW Group, also producing highly complex components for the BMW Sauber F1 Team's Formula 1 power units.

The V8 power unit of the new BMW M3 is assembled at BMW's Engine Plant in Munich, where approximately 400 individual parts and components are put together on the special engine line to form this high-performance engine.

On account of the enormous loads experienced within this high-speed power unit, the demands made of surface quality and production tolerances are very great indeed. Some components, for example, are finished to an accuracy of up to  $\frac{1}{1000}$ <sup>th</sup> of a millimetre, just  $\frac{1}{50}$ <sup>th</sup> the thickness of a human air.

### **New assembly line for all V-engines.**

The V8 power unit is assembled on a new assembly line at BMW Plant Munich in a highly flexible two-shift process. The decision to use a new assembly line is the answer by BMW's planning specialists to the ever-increasing need for greater flexibility, with the new system allowing a fast response in optimising operations to an increasing standard.

Precisely this is why all BMW V-engines will be assembled on this line on the medium term, meaning not just the new V8 power unit for the BMW M3, but also the V10 for the BMW M5 and the BMW M6, the V8 diesel and the eight- and twelve-cylinder gasoline engines for the BMW 5 and 7 Series.

Given the wide range of different engines and components, BMW's associates in production must show maximum flexibility as well as profound product knowledge and skills. Hence, all associates working on the new assembly line are experienced specialists trained in BMW engine production. Ergonomic workbays, rotating and swivelling production facilities and handling units for heavy loads help them in their work, since superior product quality calls not only for qualified workers, but also for optimum working conditions.

One example is the use of electronically controlled power screwdrivers on all critical bolted connections, with application parameters being matched individually to each engine and recorded in an appropriate database to guarantee consistent bolt application and tightening qualities even after years of ongoing work.

Profound know-how is also essential on the two-piece crankcase with its specific sealing technology, a sealing compound being injected into a groove extending round the entire sealing surface. Then, as soon as the compound comes out at the other end, it is hardened by ultra-violet light, while the compound remaining within the groove hardens in the course of the assembly process.

Both the coolant and oil cavities are subsequently checked by quality control for any leaks, with each engine finally being tested at its regular operating temperature on the test bed.

#### **Data transfer for consistent assurance of quality.**

The engines are fitted on special holders or, respectively on driverless system carriers incorporating a data control unit with the most important production data. During the assembly process the data carrier records important, quality-relevant data such as tightening torques and saves that information in a database.

The data carriers also serve to activate the appropriate program on the automotive belt-tightening units for each type of engine. The exchange of data at the assembly stations with integrated tools, in turn, ensures that the production associates use the right tools and apply the right tightening torque.

Monitors are also used at workbays involving particularly complex operations, showing the associate which of the colour-coded crankshaft bearing shells is to be placed in position at what point and at what time. Key components such as the cylinder heads or connecting rods are also coded, allowing them to be traced for reasons of quality assurance from their original delivery to the Plant via the Machining Shop all the way to Final Assembly.

#### **Skilled craftsmanship remains essential.**

Despite all this technical assistance, experience, care and craftsmanship on the part of the associate are absolutely essential particularly in pre-assembly of the valve drive and crankdrive systems. Similarly, setting the kinematics on the variable VANOS camshaft spread unit and synchronising the eight individual throttle butterflies calls for a high standard of finesse.

Precisely this is why BMW now focuses even more than before on the competence and skill of each associate in engine production. Quite simply because the human being is more flexible than any machine.

Intelligent interaction of efficient automation and the competence of skilled associates is likewise the key to supreme quality in production in body assembly at BMW Plant Regensburg. This is where the BMW M3 for the first time takes on its particular shape and contours, with up to 700 panels and metal parts being put together to form individual modules and assemblies in a process requiring 5,500 welding spots.

The next step is to assemble the floorpan, side frame, doors, engine compartment lid, side panels and the rear lid to form the complete body of the car. The carbon-fibre roof, on the other hand, is not fitted until after the paint application process, since the roof of the new BMW M3 comes in a visible carbon-fibre look and is covered merely by a coat of clear paint.

More than 95 per cent of all operations and processes in body assembly are automated, highly specialised associates programming, supervising and maintaining the technical facilities. Together with the Paintshop, the Body Assembly Shop has the highest degree of automation throughout the entire Plant.

The Paintshop is also one of the most modern facilities of its kind the world over, with car bodies going through a multi-stage paint application process on the fully automatic paintwork line at BMW Plant Regensburg.

The first step is to clean the body, after which it is dipped into a cathodic bath, with the first layer of paint being applied on the electrostatically charged body. Following the sealing process and application of the filler, the third layer of paint applied on the body is the topcoat with the colour desired by the customer.

The final layer is the powder clear paint serving to protect the surface of the car, giving the colour genuine "depth" and adding particular brilliance.

Introducing powder paint, BMW has made a significant breakthrough in promoting this particularly clean and environmentally-friendly technology neither requiring solvents nor producing any effluent.

### **Plastic side panels also painted “online”.**

The front side panels on the BMW M3 are made of an innovative high-tech thermoplastic material. And BMW's engineers have succeeded in enhancing this material to such a high standard that it can be painted “online”, going through the entire paint application process together with the body of the car, despite the high temperatures required in treating the surfaces.

Clearly, the big advantage is that this avoids the need for a separate assembly process.

The thermoplastic side panels reduce the overall weight of the car by 3 kilos, again contributing to the ideal axle load distribution of the new BMW M3, a further improvement of fuel economy, and an even higher standard of agility on the road.

### **Assembly: following the customer's requests.**

The last process in building a new BMW M3 is the assembly phase made up of some 100 individual steps. Depending on the car, several thousand modules, in some cases pre-assembled, are fitted into the vehicle in this process.

Integration of the body and the drivetrain – a process referred to as the “wedding” – is fully automatic. Most of the other operations, on the other hand, require highly qualified, individualised manual work. So to offer the associates in production optimum working conditions, ergonomics on the assembly lines at BMW Plant Regensburg have been further optimised, conveyer lines moving along with the assembly process and adjustable for both height and angle enabling the associates to perform most operations in a pleasant upright posture.

### **Available at the customer's request: when is the new car to be built?**

For more than five years, the BMW Group has been successfully applying the Customer-Oriented Sales and Production Process enabling the customer to modify the specifications of his car up to just six days prior to the start of assembly, without any effect on the date of production and delivery. This kind of flexibility is absolutely unique in the world of motoring.

### **Production at BMW Plant Regensburg: efficiency and specialisation.**

BMW Plant Regensburg has been building cars for more than 20 years. At the beginning there was just one assembly hall, while today the production plant is one of the most modern and, in particular, most flexible car production plants in the world. More than 10,000 associates, among them some 300 apprentices, are employed in the Press Shop, Bodyshop, Paintshop, Assembly, and Logistics.

Apart from the BMW M3, BMW Plant Regensburg also builds BMW 3 Series Saloons, Coupés, and Convertibles, as well as the BMW 1 Series.

A further special activity is the production and equipment of special BMW 3 Series for the police, fire brigade and emergency doctors.

In all, Plant Regensburg built some 300,000 cars in 2005.

The production of particularly exclusive and sporting cars also has a long tradition at BMW Plant Regensburg: As early as in 1994, a team of specialists in the Regensburg Bodyshop built racing car bodies, integrating the roll cage, quick-action car jacks, weight boxes and instrument panels into BMW motorsport cars.

Yet a further activity in the 1990s was to build super touring cars for European motorsport, and to prepare car bodies for series-based Group N racing.

In the year 2000 Plant Regensburg developed and built a BMW Z3 Coupé especially for the 24 Hours of Nürburgring, and on the basis of the predecessor to the new BMW M3 the specialists in Regensburg also built the BMW M3 GTR racing car for the American Le Mans Series (AMLS).

Today, in addition to series production, the specialists in Regensburg build racing bodyshells based on the BMW 3 Series for the WTTC World Touring Car Championship.



## Specifications. BMW M3.

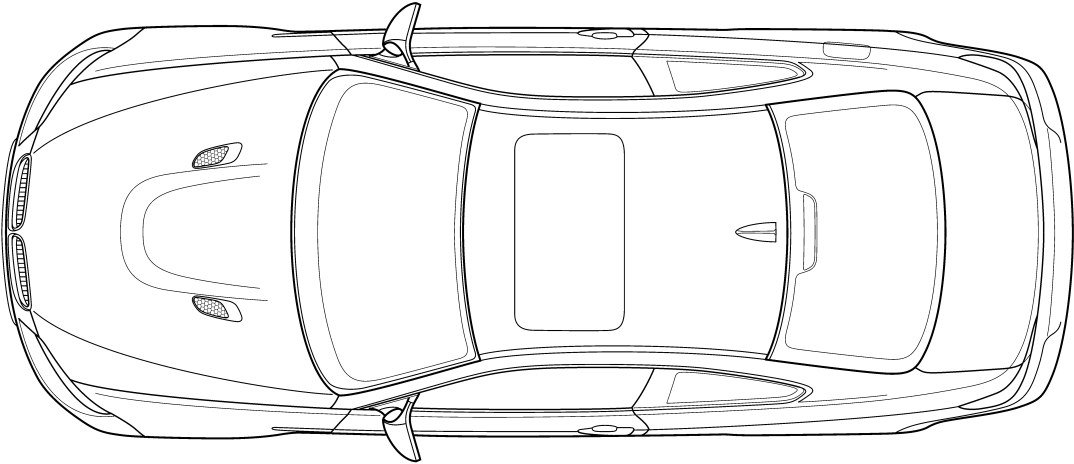
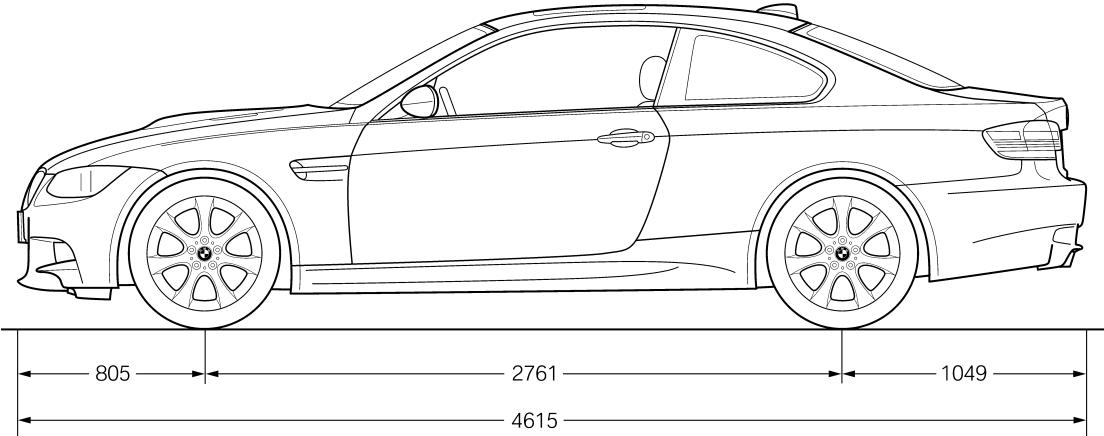
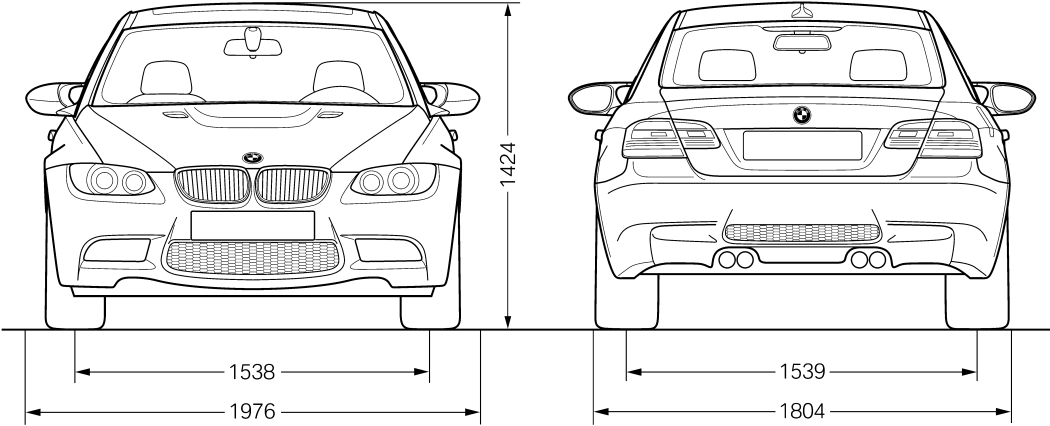
<b>Body</b>		<b>M3 Coupé</b>
No of doors/seats		2/4
Length/width/height (unladen)	mm	4,615/1,804/1,418
Wheelbase	mm	2,761
Track, front/rear	mm	1,538/1,539
Turning circle	m	11.7
Fuel tank	approx ltr	63
Cooling system incl heater	ltr	11.4
Engine oil	ltr	8.8
Transmission fluid	ltr	2.1
Final drive fluid	ltr	1.2
Weight, unladen, to EU <sup>1</sup>	kg	1,655
Max load to DIN	kg	500
Max permissible weight to DIN	kg	2,080
Max axle load, front/rear	kg	1,020/1,120
Max trailer load <sup>2</sup>		–
braked (12%/unbraked)	kg	–
Max roofload/trailer download	kg	75/–
Luggage compartment to DIN	ltr	430
Air drag	Cd x A	0.684
<b>Engine</b>		
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	8,300
Max torque	Nm/lb-ft	400/295
at	rpm	3,900
<b>Electrical System</b>		
Battery/installation	Ah/–	70/luggage compartment
Alternator	A/W	180/2,520
<b>Chassis and Suspension</b>		
Suspension, front	Aluminium two-joint spring strut axle with tiebar; small, positive compensation of transverse forces; reduction of brake 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 in compound technology
Brakes, rear	Single-piston swing-calliper compound disc brakes	
Diameter	mm	350 x 24, vented and cross-drilled in compound technology
Driving stability systems	ABS, ASC, CBC, DSC; variable M differential lock	
Steering	Rack-and-pinion steering with hydraulic assistance and Servotronic	
Steering ratio, overall	: 1	12.5
Type of transmission	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 ratio	: 1	3.846
Tyres, front/rear	245/40 ZR18 / 265/40 ZR18	
Rims, front/rear	8.5J x 18 EH2+ IS 29 aluminium, forged/9.5J x 18 EH2+ IS 23 aluminium, forged	
<b>Performance</b>		
Power-to-weight ratio to DIN	kg/kW	5.1
Output per litre	kW/hp	77.3/105.1
Acceleration 0–100 km/h	sec	4.8
standing-start km	sec	23.3
In 4 <sup>th</sup> gear 80–120 km/h	sec	4.9
Top speed	km/h	250 <sup>3</sup>
<b>Fuel Consumption in EU Cycle</b>		
Urban	ltr/100 km	17.9
Extra-urban	ltr/100 km	9.2
Composite	ltr/100 km	12.4
CO <sub>2</sub>	g/km	295
<b>Miscellaneous</b>		
Emission standard	EU4	

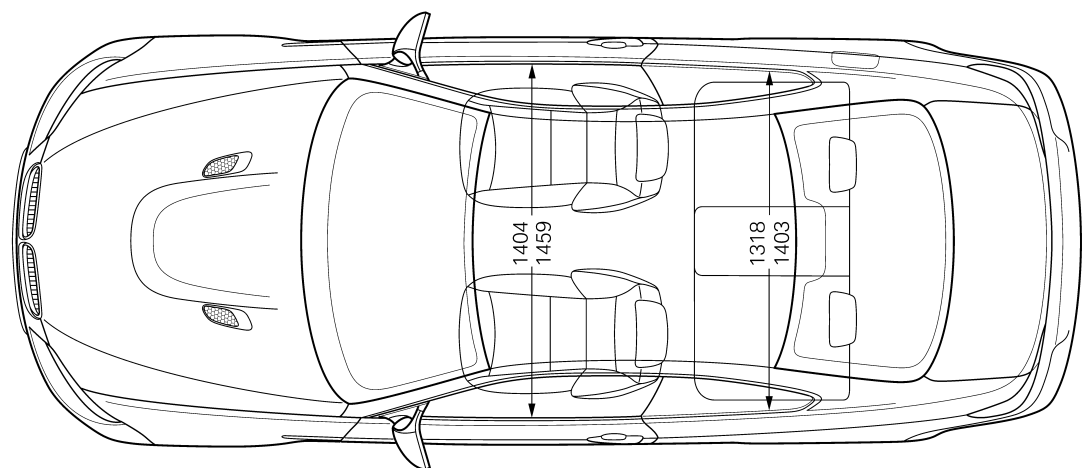
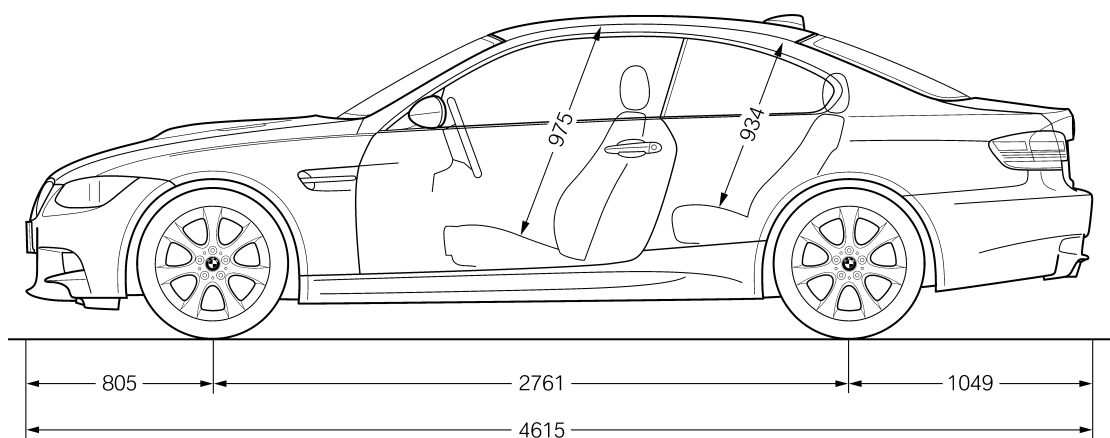
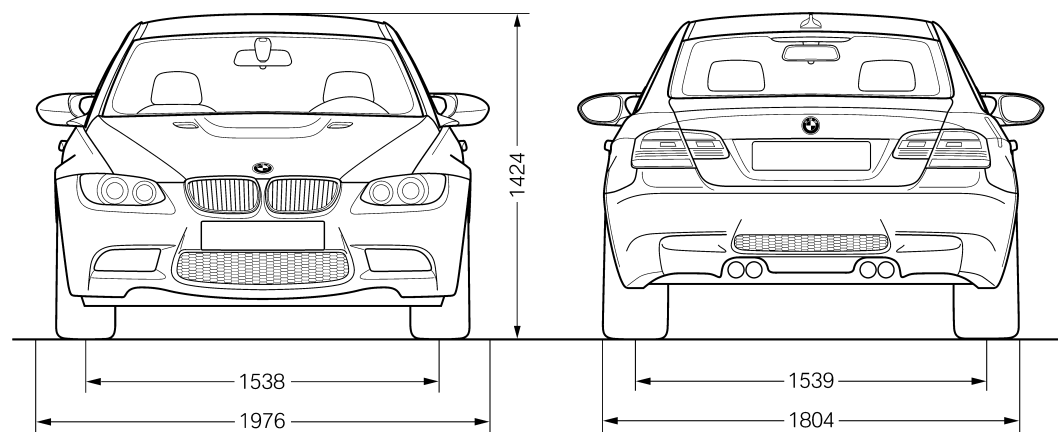
<sup>1</sup>Weight of car in road trim (DIN) plus 75 kg for driver and luggage.

<sup>2</sup>May be increased under certain conditions.

<sup>3</sup>Electronically limited.

# 10. Exterior and Interior Dimensions.





# 11. Output and Torque Diagram.

