The new BMW M6.
Contents.

1. World Debut of the new BMW M6. (Short Version)

Launching the new M6, BMW M GmbH is proudly presenting the most dynamic and sporting rendition of the 6 Series Luxury Coupé. This makes BMW's large Coupé in the guise of the M6 one of the most beautiful cars in the world – and at the same time the most sophisticated and powerful 6 Series there has ever been: five litres engine capacity, 10 cylinders,
507 bhp (373 kW), 520 Newton-metres (383 lb-ft) maximum torque, and engine speed beyond the 8,000 rpm limit.

Together with the outstanding, uncompromising suspension designed and built exclusively for sporting performance, this supreme power unit gives the BMW M6 all the qualities of a thoroughbred supersports. But unlike its competitors usually offering only two seats, the BMW M6 comes with all the space and comfort of a typical 2+2-seater, plus the luxurious features of a typical luxury performance BMW.

The success principle: True power in a discreet package.
The BMW M6 shares its supreme power unit with the BMW M5. Ever since being introduced in the M5, this engine has been acknowledged as the absolute benchmark, just as the M5 is the very epitome of the Sports Saloon.

Now, introducing even more superior performance data, the BMW M6 sets a new standard in the segment of high-performance 2+2-seater luxury sports cars. Creating this unique model, the engineers at BMW M GmbH have
focused not only on the sheer power of the engine, but also on the weight of the body and, as a result, the mass to be accelerated as quickly as possible on the road. Reducing weight to a sensible minimum, the M6 comes with all the driving dynamics required for the race track, while in terms of motoring comfort and equipment it is simply ideal for all roads the world over. Not least, the body design of the BMW M6 modified only discreetly versus the elegant look of the BMW Coupé comes with all the understatement so characteristic of all M Models as their elementary feature.

Interacting with the seven-speed SMG transmission, the magnificent chassis and suspension, the elegant body in innovative lightweight technology, as well as the wide range of luxury equipment, the ten-cylinder high-speed engine gives the customer a brand-new dimension in motoring performance. It is indeed difficult to find any genuine competitors to the M6, since all other more or less comparable cars are either all-out supersports or sports saloons

far inferior in terms of agility. So given the car's innovative drive concept, a power-to-weight ratio even better than on the M5, as well as unique handling – and all this with all the everyday driving qualities of a large coupé – the engineers at BMW M GmbH rightly claim that the new BMW M6 truly comes in a class of its own.

V10 power unit running at racing speeds.
Sharing BMW's V10 power unit, the M5 and M6 come with one of the rare high-speed engines in regular saloon and coupé production. Within the entire BMW family, the V10 is indeed the most demanding engine in technical terms and, without doubt, the top performer in every respect.

Power and performance, however, are not everything. Rather, what really counts is a car's acceleration and driving dynamics on the road. And this depends, first, on the weight of a car and, second, on the thrust and power which actually goes to the drive wheels – which, in turn, is a result of engine torque and the overall transmission ratio. BMW's high-speed engine concept allows an optimum gearbox and final drive transmission ratio in all cases, thus guaranteeing impressive thrust and momentum on the road at all times.

The perfect choice: High-revving concept.
A compact, high-revving normal-aspiration engine is the best of all strategies in generating maximum engine output: Revving up to speed of 8,250 rpm, the V10 reaches a speed range reserved until recently to purebred racing cars alone. As a result, the engine easily outperforms the magical limit of 100 bhp per litre, again achieving specific output of a standard otherwise only found in motorsport.

The two five-cylinder banks in the V10 are arranged at an angle of 90° in order to optimise the standard of vibration control and motoring comfort offered by full mass compensation on the crankdrive. Taking the substantial forces of the combustion process, high engine speeds and vibrations into account,
the crankcase comes in bedplate design. The extremely stiff crankshaft, in turn, runs in six bearings.

Variable dual-VANOS camshaft control ensures an optimum cylinder charge cycle in the interest of extremely fast valve timing. On the road this means even more performance, an improved torque curve, optimum responsive-

ness,
lower fuel consumption, and emissions reduced to a minimum. Again reflecting the typical features of motorsport, each cylinder comes with its own throttle butterfly masterminded fully electronically for each row of cylinders.

Twin-chamber exhaust system made of stainless steel.
Made of stainless steel without any connecting seams, the exhaust system comes in twin-chamber configuration all the way to the silencers, before exhaust emissions leave the car through the four tailpipes so characteristic of every BMW M Car. It almost goes without saying that exhaust emissions meet the European EU4 and, respectively, the US LEV2 standards, the M6 standing out from the M5 also through its even more powerful and sporting sound.

This outstanding performance and emission management is ensured and masterminded by the central engine management unit featuring the most powerful processors currently to be found in any car anywhere, since the demands made of the management system are obviously particularly stringent due to the very high engine speed and the sum total of all control and management functions.

A particular highlight of the engine control unit is ionic current technology serving to detect any tendency of the engine to knock, misfire and suffer mis-combustion. This intelligent control unit is able to sense any tendency to knock via the spark plug in each cylinder, checking the correct ignition setting and recognising any tendency to misfire and thus allowing the engine to run
as closely as possible to its theoretical limits, developing optimum power and performance in the process. The spark plug serves both as an actuator for the ignition and as a sensor observing the combustion process.

Seven-speed SMG transmission conveying M Power to the road.
To develop all its qualities and assets, a high-speed power unit must be combined with the right transmission. This is the only way, given the right transmission ratios, for the drivetrain to develop all the power and torque provided by the engine in giving the car optimum thrust and forward motion.

BMW’s seven-speed SMG transmission is precisely the right manual gearbox for conveying the power of the V10 via the drivetrain to the rear wheels. This gearbox from BMW M is indeed the world’s only sequential transmission with seven gears and Drivelogic. With qualities even greater than on a six-speed SMG gearbox, this transmission allows manual selection of gears with extremely short gearshift times as well as comfortable cruising qualities thanks to the automatic gear selection function. And at the same time the additional gear keeps the increments between engine speed and torque

even smaller, ensuring an absolutely smooth process of one gear “flowing” into the other.

The driver shifts gears in the SMG transmission either from the selector lever or via paddles in the steering wheel. Compared with conventional SMG transmission, the new generation of SMG technology performs the entire gearshift process 20 per cent faster, gears merging directly into one another.

As a result, any interruption of the flow of power inevitable when shifting gears now becomes hardly perceptible, the BMW M6 accelerating virtually without the slightest jolt or interruption from a standstill all the way to top speed.

Drivelogic: The driver determines how SMG shifts gears.
Featuring its special Drivelogic function, SMG on the BMW M6 offers the driver a total of 11 gearshift options allowing him to individually adjust the gearshift characteristics of the SMG transmission to his personal style of motoring.

Six of these driving programs come in the sequential manual function (S-mode), ranging from smooth but dynamic all the way to supersports. Driving in the S-mode, the driver shifts all gears manually. But thanks to the launch control function SMG Drivelogic shifts gears automatically shortly before the engine reaches its maximum speed, ensuring an optimum gearshift process with optimum spin control all the way to the top speed of the
BMW M6.

In the automatic shift mode (Drive = D-mode), the transmission shifts the seven gears automatically as a function of the driving program currently in use, the driving situation, road speed, and the position of the gas pedal.

SMG for even greater safety and motoring comfort.
Seven-speed SMG supports the driver not only in achieving and enjoying the highest standard of performance comparable to genuine motorsport. Rather,
it also comes with many safety features opening up the clutch within fractions of a second in a critical situation – for example when shifting down on a slippery surface – in order to keep the car stable and free of excessive engine forces acting on the drive wheels. A further special function is hill detection adjusting the gearshift points on uphill and downhill gradients. Driving uphill, this avoids the common phenomenon of the gears constantly shifting up and down (“pendulum gearshift”), driving downhill the hill detection mode holds lower gears in mesh longer than usual in order to capitalise on the engine’s braking effect.

Last but not least, SMG also enhances the particular sound effect of the V10 power unit: To quote a specialist commenting on this special sound, that

“brief, roaring rumble” is simply fantastic when the electronic control unit responsible for the engine briefly gives intermediate gas in the process of shifting down.

Maximum driving pleasure.
Interaction of the V10 power unit and seven-speed SMG gives the driver of the BMW M6 Coupé driving pleasure of the highest calibre: Acceleration from
0–100 km/h comes in 4.6 seconds and the M6 reaches 200 km/h or 124 mph in just about 14 seconds. Then, at a speed of 250 km/h or 155 mph, the electronic speed governor ends the car's irresistible surge of power, while the speedometer gives you an idea where the engine would take you without
such electronic speed control: the speedometer goes all the way to 330 km/h or 205 mph.

Lapping the Northern Circuit of Nürburgring in 8 minutes.
The world-famous *Nordschleife*, the Northern Circuit of the legendary Nürburgring Race Track, is the perfect benchmark for measuring driving dynamics. For it is here, on the world's most demanding race track, that the exceptional stand out from the mediocre in terms of supreme driving dynamics. Nowhere else is the interaction of all a car's components as clear as here, when driving to the absolute limit. Lapping the Northern Circuit in around 8 minutes, the BMW M6 easily matches the most thoroughbred sports cars, clearly beating the competition.

M Suspension: The icing on the cake of the BMW 6 Series.
Lap times of this kind clearly bear testimony to the M6' driving qualities. Which is actually no surprise, considering that the chassis and suspension already outstanding on the BMW 6 Series as such, as well as the modern assistance systems, have been specially adapted on the M6 for truly unparalleled M Performance. Compared with the M5, in turn, the wheelbase is shorter and the car comes with a lower centre of gravity for extra agility on the road. In terms of both chassis equipment and set-up, the M6 is therefore a unique car in every respect.

Variable M Differential Lock.
The variable, speed-sensing M Differential Lock gives the M6 superior driving stability and optimum traction particularly when accelerating out of a bend. Even in very demanding driving situations, the differential offers crucial advantages in terms of traction, for example with the drive wheels running on very different surfaces with a wide range of different frictional coefficients.
A further advantage is the locking action immediately built up when

necessary to compensate any difference in speed between the drive wheels, thus ensuring smooth and powerful drive forces at all times.

DSC with two dynamic driving programs available on demand.
The BMW M6 boasts a brand-new generation of DSC Dynamic Stability Control. With the first stage of DSC being conceived for maximum driving safety, the M Dynamic mode, as on the M5, is tailored to the sporting driver. And pressing a button on the selector lever cover, the driver is able to switch off DSC whenever he wishes.

EDC: From firm and taut all the way to comfortable and extra-smooth.
EDC Electronic Damper Control on the BMW M6 offers the driver the choice of three programs available on demand: Comfort, Normal, and Sports, with the car's chassis and suspension ranging from sporting and firm all the way to – relatively – smooth and comfortable. The driver operates EDC via the MDrive button on the steering wheel or the push button next to the SMG selector lever.

Power button activating special engine characteristics on demand.
In many situations the driver does not need all the power and agility of the BMW M6 – for example in city traffic. So when the driver starts the engine, the BMW M6 automatically sets off in its comfort-oriented P400 performance program with 400 bhp engine output. But then all the driver has to do is press the power button on the selector lever cover in order to use all the muscle
and dynamic performance of the supreme ten-cylinder. This also changes the response of the engine, making it even more direct and responsive, both the P400 program and the even more dynamic P500 sports program giving free rein to the driver's wish for uncompromising motorsport performance.

High-performance brakes like in motorsport.
Reflecting its truly outstanding power and performance, the BMW M6 naturally features extra-large high-performance brakes complete with cross-drilled extra-low-weight compound brake discs. The double-piston swing callipers made of aluminium, in turn, optimised for both weight and stiffness, ensure stopping distances shorter than ever before: Applying the brakes from
a speed of 100 km/h, the driver of the BMW M6 comes to a standstill after just 36 metres and takes less than 140 metres to reach a stop from a speed of 200 km/h (124 mph).

High-performance athlete in a beautiful body.

With the BMW 6 Series already acknowledged as a strikingly beautiful car, the M6 enhances this impression to an even higher standard, special design features making this unique Coupé look even more powerful and dynamic, while remaining discreet and unpretentious all the same.

The most eye-catching feature is the truly impressive front air dam. And like all design features on a BMW M Car, this particular element focuses once again primarily on its specific function: The V10 power unit requires roughly twice as much cooling air as the V8 in the BMW 645Ci. Large secondary intake openings to the left and right of the front air dam thus give the engine of the M6 even more air to breathe and cool the brakes at the same time. Through their design alone, finally, these air openings accentuate the sporting character of the car.

Lightweight engineering and beautiful design in perfect harmony.
Beneath the doors the side-sills powerfully contoured for aerodynamic reasons again emphasise the dynamic impression of this sports coupé. At the same time the side-sills stretch the car for an even sleeker look, making the BMW M6 even lower and more dynamic in its appearance. The 19-inch forged aluminium wheels developed especially for the M6, together with their five filigree double spokes, are extremely light and provide a very good view of the large brake discs. Compared with comparable wheels, the weight saving is 1.8 kilos per wheel.

The M model logo in the ornamental slats at the side tells the connoisseur right away that this car is one of the outstanding athletes within the BMW M Family. And like on all M Models, the exterior mirrors come in their very own, sporting look.

The rear air dam with its characteristic diffuser opening again serves first and foremost to provide an aerodynamic function. But at the same time it adds an even more sporting look to the car, the particular design of the diffuser improving the flow of air along the underfloor and reducing lift forces. The four tailpipes on the twin-chamber exhaust system bordering the diffuser
opening in pairs on either side are one of the signs of distinction so typical of a BMW M Car.

First-ever carbon roof in series production.
The first car to feature a roof made of carbon was the BMW M3 CSL. Now, following that special model built in small, strictly limited series, BMW M GmbH is introducing a carbon roof on the M6 Coupé, thus raising this concept of intelligent lightweight technology to a new dimension in series production.

Offering the same stability and crash safety as a steel roof, this carbon-fibre material derived from motorsport is significantly lighter than aluminium, let alone steel. The result is a significant reduction in weight and mass lowering the car's centre of gravity and requiring less forces for acceleration or coming to a stop.

Inside, the M6 stands out from the “basic” model also through its even more sophisticated Merino leather upholstery with a choice of three different colours or – at extra cost – with full leather upholstery leaving absolutely nothing to be desired.

A sports car for everyday motoring.
Despite its simply shuttering performance, the BMW M6 does not make any compromises in terms of adequate roominess as well as active and passive safety of the highest standard. Even the level of motoring comfort is virtually the same as in the “regular” model. And when it comes to both fuel economy and environmental compatibility, the M6 again lives up the exemplary standard of all BMWs.

2. The new V10 Power Unit in the BMW M6: A Masterpiece in Engine Construction.

The ten-cylinder power unit featured in the BMW M6 may rightly be regarded as the most fascinating engine you can imagine in a production car. Launched just half a year ago in the BMW M5, this unique power unit has been
thrilling customers and car journalists all over the world ever since, offering a seemingly never-ending surge of power and performance. Indeed, many people see this engine as the “civilian derivative” of the BMW WilliamsF1 racing unit.

The V10 is reminiscent of BMW’s Formula1 racing engine also in terms of its sound: A bit deeper and more muscular than even the engine in the M5, the V10 featured in the BMW M6 clearly “shouts out” its dedication to motorsport.

Inspired by the Formula1 power unit.
The V10 featured in the BMW M6 shares both the number of cylinders as well as its high-speed concept with BMW’s Formula1 power unit. This alone guarantees enormous thrust and muscle from high engine speeds, a feature characteristic of all high-performance normal-aspiration power units developed and built by BMW M GmbH.

Reflecting this exclusive standard, this top-of-the-range engine is equally impressive in all its specifications: ten cylinders, five litres capacity, 507 PS (373 kW) maximum output, 520 Newton-metres (383 lb-ft) maximum torque, engine speeds up to 8,250 rpm – a power pack in its purest form.

But at the same time this engine is far more than the sum total of outstanding performance data: Barely touching the gas pedal, you will immediately appreciate this high-speed normal-aspiration engine as a typical sports power unit. And at the same time it is absolutely perfect in everyday traffic: Sometimes a luxurious coupé, sometimes a thoroughbred sports car. So the M6 offers you the best of both worlds, setting the benchmark in both categories.

Brand-new and offering the best of the best.

The V10 power unit created by the engineers at BMW M GmbH for the M5 and M6 is brand-new from the ground up. In the process of developing this engine, they were inspired, first, by the BMW WilliamsF1 power unit, one of the most powerful engines in the highest category of motorsport. And at the

same time, as their second consideration, they focused on M-specific features in standard production such as double-VANOS, individual throttle butterflies, top-performance engine electronics, and oil supply with centrifugal force control.

In principle there are three options to achieve optimum power and performance in engine construction: To make the engine larger, obtaining higher torque in the process, to boost engine output by means of a turbocharger or compressor, or to increase engine speed by means of the high-speed engine philosophy.

Power is more than just a number.
This means that on the road, power and performance is more than just an impressive bhp rating. Rather, what really counts is a car's behaviour when accelerating and, accordingly, its driving dynamics. And this depends on the thrust and muscle actually generated by the drivetrain as well as the weight of the car. The thrust going to the drive wheels, in turn, is a result of engine torque and the overall transmission ratio. The high-speed engine concept, therefore, allows exactly the right transmission and final drive ratios, guaranteeing impressive performance also in everyday motoring.

Given these basic laws of physics, we find huge differences between various engines, even when on paper they have the same output. A large-volume engine, for example, has the disadvantage of both extra weight and larger dimensions leading to higher fuel consumption. A turbocharged engine likewise consumes more fuel and lacks spontaneity, that is the instantaneous response of the engine to the driver's wishes.

The high-revving concept – the perfect answer.
This leaves the third option: the compact, fast-revving normal-aspiration power unit. And indeed, for traditional reasons alone the engineers at BMW M acknowledge this concept as the ideal solution increasing engine output and performance by an appropriate increase in engine speed. The fact remains, however, that the high-speed engine concept is far more demanding in technological terms, making it a greater challenge requiring more sophisticated solutions. Reaching engine speeds of 8,250 rpm, the V10 enters a speed range until recently reserved to thoroughbred racing cars alone.

Formula 1 technology for the road.
Featuring qualities of this kind, the new V10 raises the limits to technology in series engine production to a higher standard never seen before. A comparison clearly shows what this means in terms the loads and forces acting on the various materials: At a speed of 8,000 rpm, each of the 10 pistons covers a distance of some 20 metres a second. And revving at 18,000 rpm in the BMW WilliamsF1, piston travel is even 25 metres per second. But while durability is merely a relative factor in motorsport, a BMW M engine must last the same long life as the car itself – in all kinds of weather, under all traffic conditions, and with that typical M style of motoring.

507 bhp for a new world of driving dynamics.
The fast-revving ten-cylinder develops maximum output of 507 bhp (373 kW) at 7,750 rpm. But compared with its output and performance it remains a lightweight athlete weighing just 240 kg or 529 lb. When it comes to output per litre, on the other hand, this engine is definitely a “heavy” player, the ten-cylinder easily outperforming the magical limit of 100 bhp per litre, with specific output comparable to that of a racing machine.

Only engine speed can really bring out power and torque.
Maximum torque of 520 Newton-metres or 383 lb-ft comes at 6,100 rpm. But the ten-cylinder develops 450 Newton-metres or 332 lb-ft from just 3,500 rpm, with 80 per cent of the engine’s maximum torque being offered consistently throughout a wide range of 5,500 rpm.

This alone places the BMW M6 with its high-speed engine far above the competition, with virtually all other models focusing on torque alone provided by larger engine capacity and/or turbocharging. A further drawback with other models is that they require a significantly reinforced and, as a result, very heavy drivetrain to convey their extremely high torque, thus suffering from
extra weight and mass which consistently has to be accelerated and slowed down. By contrast, BMW’s compact V10 with its high-speed concept benefits from a far lighter drivetrain with a much faster gearshift.

A good example is that of a cyclist riding up a hill: Shifting back a gear, the cyclist will have to turn the pedals faster, but is able in return to take virtually every gradient. Should he remain in the same gear or even shift up, on the other hand, he has to put more strength into the pedals or, quite simply, get off his bicycle. So assuming two cyclists absolutely equal in their strength

and stamina, the winner will always be the cyclist able to turn the pedals more quickly.

Ten cylinders – the sports concept.
Ten cylinders are the optimum concept for a high-performance sports engine: An engine of this kind has exactly the right dimensions, the right number
of components and filling capacities. And displacing 500 cubic centimetres, each cylinder is of exactly the right size, as defined by the really demanding engine specialist.

Compact construction for extra strength and enhanced comfort.
As one of the world's leading engine manufacturers, BMW has become famous above all for its in-line power units. Now, focusing on the ten-cylinder, the engineers at BMW M GmbH have placed two rows of five cylinders next to each other at a V angle of 90° and with displacement between the two cylinder banks of 17 millimetres or 0.67″, thus forming a very compact and dynamic configuration. The 90° angle was chosen for its vibration-and comfort-oriented mass balance, perfectly solving the conflict of interests between maximum smoothness free of vibrations and a high level of component strength.

The cylinder crankcase is cast in a low-pressure die-casting process using an over-eutectic aluminium-silicon alloy, in this case with a share of silicon of
at least 17 per cent. The cylinder liners are formed by exposing the hard silicon crystals, with the iron-coated pistons running directly in the uncoated bore. Cylinder stroke measures 75.2 millimetres or 2.96″, cylinder bore is 92.0 millimetres or 3.62″, adding up to an overall capacity of 4,999 cc.
Like the engine blocks for Formula1, the M engine blocks are incidentally cast at BMW's light-alloy foundry in Landshut just north of Munich.

Bedplate construction like in motorsport.
High engine speeds, high combustion pressure and temperatures subject the crankcase to extremely tough and demanding conditions. The engineers at BMW Motorsport have therefore made the crankcase very compact and unusually stiff in a so-called bedplate structure, a technology carried over from motorsport. The BMW ten-cylinder is indeed the first production V engine to feature such a bedplate construction.

The aluminium bedplate with grey-cast-iron inlays guarantees very precise crankshaft bearing – in particular, it keeps main bearing tolerance within close limits throughout the entire range of operating temperature. The grey-

cast-iron inlays reduce thermal expansion of the aluminium housing and feature
special openings to provide a positive connection with the surrounding aluminium frame. At the same time this construction serves to fulfil the acoustic requirements made of the engine.

Specially designed for a high level of stiffness and finely balanced for optimum precision, the crankshaft made of forged, high-strength steel runs in six bearings and weighs just 21.8 kg or 48.1lb. Designed for minimum mass inertia, the crankshaft offers a very high standard of torsional stiffness. In each case two connecting rods interact with one of the five crank journals displaced from one another at an angle of 72°. The small distance between cylinders of just 98 millimetres or 3.86˝ and the short crankshaft made possible as a result interact with one another for a very high level of flexural and torsional stiffness on very low weight.

Lightweight engineering watching out for every gram.
The weight-optimised box-type pistons are cast out of a high temperature-resistant aluminium alloy and are iron-coated on the surface, weighing just 481.7 grams including their piston pins and rings. Compression height is 27.4 millimetres or 1.08˝, with a compression ratio of 12.0:1. The pistons are cooled by oil spray nozzles connected to the main oil duct. The trapezoidal connecting rods, in turn, measuring 140.7 millimetres or 5.54˝ in length, are weight-optimised, manufactured in cracked technology, and come in high-strength steel. This effectively reduces oscillating masses within the engine, each of the connecting rods forged from 70MnVS4 weighing just 623 grams including the bearing shell.

The single-piece aluminium cylinder heads on the V10 power unit are also cast by BMW at the light-alloy foundry in Landshut. As an important contribution to the appropriate temperature of the catalyst with the catalytic converter warming up quickly, the cylinder heads come with integrated air ducts for secondary air injection. A further feature is the typical configuration with four valves per cylinder characteristic of a BMW power unit, the valves themselves being operated by ball-shaped cup tappets with hydraulic valve play compensation. Tappet diameter is just 28 millimetres or 1.10˝, tappet weight 31 grams. The intake valves, in turn, measure 35 millimetres or 1.38˝ in diameter, the outlet valves 30.5 millimetres or 1.20˝.

Special innovations reducing the cost of maintenance.
The intake valves are made exclusively for the V10. Measuring only 5.0 millimetres or 0.20˝ in diameter, they come with particularly thin shafts hardly impairing flow conditions in the intake duct. Valve clearance is automatically maintained at exactly the right point by hydraulic valve play compensation elements, helping to reduce the cost of ownership.

More power from the engine means a greater need for efficient cooling, particularly near the combustion chambers. With its crossflow cooling concept, the V10 power unit significantly reduces pressure losses in the

cooling system compared with a conventional cooling configuration, guaranteeing a consistent distribution of temperatures in the cylinder head and reducing temperature peaks at all critical points.

Each cylinder is cooled consistently by an optimum amount of coolant flowing smoothly around the cylinders. To achieve this effect, the coolant flows from the crankcase via the outlet side of the engine through the cylinder head and over the collector rail on the intake side all the way to the thermostat and, respectively, the radiator itself.

High-pressure double-VANOS for an optimum cylinder charge.
Variable double-VANOS camshaft management ensures an optimum charge cycle within the ten-cylinder. This, in turn, helps to keep valve timing extremely short and fast – which in practice means more power, an even better torque curve, optimum responsiveness, greater fuel economy, and cleaner emissions.

Running at low loads and engine speeds, the engine therefore operates with a greater valve overlap and, as a result, a higher level of internal exhaust gas recirculation. This, in turn, reduces charge cycle losses and improves
fuel economy accordingly. As a function of the gas pedal position and engine speed – the parameters crucial to the power and performance required of the engine – valve increments are adjusted infinitely and by way of map control.
To ensure such efficient management, the sprocket connected with the crankshaft by a single chain is linked to the camshaft by a two-stage helical gearing. With the adjustment piston being moved along its axis, the helical gear pattern turns the camshaft relative to the sprocket, allowing variation of the intake camshaft angle by up to 66° and the outlet camshaft angle by up to 37°.

M double-VANOS requires a high level of oil pressure in order to adjust the camshaft at maximum speed and with maximum precision. Accordingly, engine oil is compressed to an operating pressure of 80 bar by a radial piston pump fitted in the crankcase. This map-controlled high-pressure adjustment guarantees short adjustment times and provides the optimum spread angle synchronised to ignition timing and the amount of fuel injected as a function of engine load and speed at all operating points.

Reliable oil supply even in extremely fast bends.

The oil required for lubrication is delivered to the engine by a total of four oil pumps. The reasons for such an unusually elaborate and sophisticated oil supply system are the high standard of dynamic performance and the extreme acceleration of the BMW M6. In bends, for example, BMW's large Coupé is easily able to achieve lateral acceleration of well over 1g. The centrifugal forces

generated in such a process press the engine oil into the outer row of cylinders to such an extent that the oil is no longer able to flow back in the usual process from the cylinder head, possibly leading to a lack of oil in the sump. And should the worst really come to the worst, the oil pump might then draw in air instead of oil.

To definitely rule out such an eventuality, the engine comes with lateral force-controlled oil supply where, starting at lateral acceleration of approximately
0.6 g, one of two electrically driven duocentric pumps draws oil out of the outer cylinder head in a bend and conveys it to the main oil sump. A lateral acceleration sensor serves as the actuator for initiating pump action, the oil pump itself is a volume-flow controlled pendulum slide cell pump delivering exactly the amount of engine oil actually required by the engine. This is made possible by the inner rotor of the pump adjustable in its eccentricity versus
the pump housing as a function of current oil pressure in the main oil duct.

A lubrication film which does not break when applying the brakes.
When applying the brakes to the extreme, the BMW M6 builds up negative acceleration up to a staggering 1.3 g. Under such extreme conditions, it is quite possible that the flow of oil back to the oil sump serving as an intermediate storage reservoir will no longer be sufficient, especially as the oil sump for reasons of space is fitted beneath the front axle subframe. So if the worst came to the worst, lubrication might be entirely interrupted.
To reliably prevent this eventuality, the engine of the BMW M6 comes with a so-called “quasi-dry sump system” incorporating two oil reservoirs: one in front of the front axle subframe, another behind the subframe.

A reflow pump integrated in the compressed oil pump housing draws oil out of the small oil sump at the front and pumps it into the large oil sump at the back. Both the reflow openings and the compressed oil pump extraction point are precisely matched to the car’s acceleration and driving forces.

Ten individual throttle butterflies controlled electronically.
Again reflecting the supreme standard of motorsport, each of the ten cylinders comes with its own throttle butterfly, each row of cylinders being controlled by a separate adjuster. While this system is extremely demanding and sophisticated in mechanical terms, there is no better way to achieve supreme engine response within split-seconds. And to give the engine a

particularly sensitive response at low engine speeds while building up power just as fast wherever necessary for dynamic performance of the highest standard,
the throttle butterflies are masterminded electronically by two contact-free Hall potentiometers scanning and evaluating the position of the gas pedal 200 times a second.

Responding precisely to any change in running conditions, engine management sets the position of the ten individual throttle butterflies via the two adjusters. Naturally, it goes without saying that all this takes place within fractions of a second, only 120 milliseconds being required to open the throttle butterflies in full – roughly the time a routined driver takes to press down the gas pedal.

The benefit for the driver is supreme engine response with the car “taking off” without the slightest delay and the driver being able to sensitively dose the engine power required. At the same time electronic operation of the throttle butterflies makes the transition from overrun to part load and vice versa absolutely smooth and harmonious.

The V10 draws in the air it needs through ten flow-optimised intake funnels extending into two air collectors. The funnels and collectors are all made of a light composite material containing 30 per cent glass fibre.

Twin-chamber stainless-steel exhaust system.
As important as the intake side may be for giving the power unit of the M6 maximum output and performance, the exhaust system may not be neglected in any respect. So here again, only the best meets the demanding standards of the engineers and other specialists at BMW M.

The two five-in-one stainless-steel manifolds have been optimised in elaborate computer processes to provide exactly the same operating length.
To ensure exactly the right tube diameter, in turn, the stainless-steel pipes produced as one unit without a seam in between are formed from inside in an
internal high-pressure moulding process and under a production pressure of up to 800 bar. And last but not least, the exhaust manifolds come with walls measuring only about 0.8 millimetres in thickness – again a clear sign of the utmost care and diligence the engineers at BMW M have given to each and every detail of this masterpiece in engine construction.

A high-performance sports engine clean and compatible with the environment.
The exhaust system is designed consistently for minimum counterpressure, the dynamic gas flow is optimised for perfect power and torque. The exhaust system extends back to the silencers in two chambers, leading into the

four striking tailpipes so typical of a BMW M Car. And contrary to the M5, the sound of the exhaust on the M6 is even more muscular and aggressive.

As is to be expected of a BMW M Car, two trimetal-coated catalysts on each exhaust pipe clean emissions from the ten-cylinder in line with the demanding European EU4 and, respectively, the equally stringent US LEV2 standards. Two catalysts are fitted in the underfloor, one catalyst each in the exhaust pipe close to the engine. In conjunction with the thin-walled exhaust gas manifolds, these catalysts reach their optimum operating temperature as quickly as possible, a significant requirement particularly when starting the engine cold.

Particular fortes of the system are its low pressure loss and high level of mechanical stiffness.

Engine control unit unique the world over.
The MS S65 engine management unit is crucial to the outstanding performance and emission management of the V10. It ensures optimum coordination of all engine functions, on the one hand, and the car's control units, on the other, interacting particularly well with the SMG transmission.

This engine management system is quite unique in production engine technology worldwide: Incorporating more than 1,000 components, it has by far the highest level of package density. And both the hardware and software, as well as the specific functions of the system, have all been developed
by BMW M.

High engine speed demands extreme performance.
Given the high speed of the engine and the large number of management and control functions, the demands made of the engine management system
are very significant indeed. To meet these demands, the MS S65 control unit comes with no less than three 32-bit processors able to handle more than 200 million operations per second. Working with absolute precision, they determine the optimum ignition timing from more than 50 incoming signals individually for each cylinder and operating cycle, at the same time calculating the ideal cylinder charge, injection volume and injection point. And the system also determines and sets the optimum camshaft spread, just as it adjusts the individual throttle butterflies.

Pressing the Power button, the driver is able activate a high-performance program calling up all of the engine's power and performance. This program

uses a more progressive map control line relating gas pedal to the opening of the throttle butterflies and modifying the dynamic engine management functions for even greater responsiveness.

The more comfort-oriented of the two programs is called up automatically as soon as the engine is started, with the driver having the option to configure
the program switch-over function as a feature of the car's MDrive control. MDrive incidentally offers yet a further sports program for particularly dynamic motoring.

Engine management with a wide range of additional functions.
Electronic throttle butterfly control is based on a system of all-round output and torque management: The potentiometer on the gas pedal measures the driver's demand for power and performance, translating this signal into the torque and output required at any given point in time. The output and torque manager then adjusts this power request by taking ancillaries and additional equipment such as the a/c compressor or alternator into account. Functions such as idle speed control, exhaust gas management and knock control are also coordinated and compared with the maximum and minimum forces required for DSC Dynamic Stability Control as well as EDFM Engine Drag Force Management. The desired power and torque calculated in this way is then set within the engine, focusing in the process on the current ignition angle. And last but not least, engine management performs a wide range of additional on-board diagnostic functions with diagnostic routines for the workshop, additional operating functions, as well as the efficient management of peripheral units.

A new highlight in engine management: ionic current technology.
Ionic current technology serving to detect any risk of the engine knocking as well as misfiring and mis-combustion is a new highlight featured by the engine control unit. "Knocking" is unwanted self-ignition of fuel in the cylinders. Engines without knock control have a somewhat lower compression ratio and a somewhat later ignition point, to make sure that none of the cylinders ever reaches or let alone exceeds the knock limit. However, this "safety" distance from the knocking limit means a trade-off in terms of fuel economy, engine output, and torque.

Active knock control, by contrast, allows the engine to run at its optimum ignition point, knock management protecting the engine from damage at all points where knocking is monitored and limited. The result, obviously, is maximum efficiency on the road.

With conventional technology knock control receives its knock signal from various body sound sensors fitted on the outside of the cylinders. On a BMW M Car there is one sensor for each set of two cylinders. But as sophisticated and progressive this technology may otherwise be, even this is not sufficient on a multi-cylinder, high-speed engine such as the new V10, and is therefore

not able to reliably detect the risk of the engine knocking. And since at the same time a relatively high standard of monitoring accuracy is essential in the light of high engine speeds in order to guarantee appropriate combustion quality in the cylinders and, accordingly, a long service life of all components and appropriate emission control, the new technology now introduced is
ionic current management.

Spark plugs with additional control functions.
Using this technology, the engine is able, via the spark plug in each cylinder, not only to sense and control the risk of knocking, but also to monitor the ignition process and recognise any tendency of the engine to misfire. In other words, the spark plug serves both as a sensor observing the combustion
process and as an actuator for the ignition. And precisely this marks the big difference versus a conventional knocking and ignition sensor fitted outside of the combustion chamber. Ionic current measurement, by contrast, is conducted directly within the combustion chamber, the spark plug itself serving as the sensor.

Measurements right in the middle of the combustion process.
The temperatures generated in the combustion chambers of an internal combustion engine may well be up to 2,500 °C or 4,500 °F. As a result of these high temperatures and chemical reactions during the combustion process, the gasoline/air mixture in the combustion chambers is partially ionised. Particularly along the flame front, the gas becomes electrically conductive once ions are formed by the fission and accumulation of electrons (ionisation). By means of the spark plug electrode electrically insulated from the cylinder head and connected to a control unit – the ionic current satellite – affiliated in turn to the engine management unit, the system is able to measure the ionic current flowing between the electrodes, with the spark plug
electrode itself being kept under direct voltage. The level of such ionic current flow depends on the degree of gas ionisation between the electrodes.

Ionic current measurement thus provides information on the combustion process directly where it counts, that is in the combustion chamber itself. The ionic current satellite receives signals from the five spark plugs in each row of cylinders, amplifies these signals and conveys the data to the engine

management unit. The control unit then analyses the data received and, where necessary, intervenes on specific cylinders, adjusting the ignition timing ideally to the combustion process by way of knock control.

This dual function of the spark plugs serving, first, as the spark-generating unit and, second, as a sensor, helps additionally to facilitate diagnostic procedures in maintenance and service.

3. The Seven-Speed SMG Gearbox: Shifting Gears like in Formula 1.

To provide perfect results, the high-speed engine concept must be combined with an appropriate transmission. This is the only way to convert the power coming from the engine into optimum momentum on the road by means of the right – short – overall transmission ratio.

BMW's Sequential M Gearbox (SMG) with seven speeds is exactly the right manual gearbox for ideally conveying the power of the V10 to the wheels via the car's drivetrain. BMW M is the first manufacturer to offer such a sequential gearbox with seven gears and Drivelogic providing both a manual gearshift with extremely fast shift times as well as an automatic transmission function for cruising comfortably in style.

In technical terms, the gearbox is conceived for torque of up to 550 Newton-meters (405 lb-ft) and engine speeds of up to 8,500 rpm. In other words, it offers adequate reserves for consistent reliability throughout the car's complete running life, with additional back-up being provided by a separate oil cooler for the high-performance transmission.

Even smaller gear increments than with BMW's six-speed gearbox.
Seven gears keep the gaps between engine speeds and torque levels when shifting gears even smaller than with a six-speed gearbox. And since the power actually conveyed to the wheels depends on high engine speeds, such smaller increments are the best guarantee for truly dynamic acceleration.

SMG transmission for the pure joy of shifting gears.
The seven-speed SMG transmission naturally offers all the benefits of the sequential gearbox concept: The driver is able to shift gears either via the selector lever in the centre console or from paddles on the steering wheel, without having to press a clutch pedal. Instead, he can even keep his foot on the accelerator while shifting gears. And unlike automatic transmission,
the Sequential SMG Gearbox does not need a torque converter taking up energy and reducing the car's performance.

The SMG transmission shifts all gears electrohydraulically with all control units operating by wire, that is without any mechanical connections. Both the SMG hydraulic unit and the gearshift actuators are integrated in the transmission housing. Whenever the driver wishes to shift gears, the control unit activates the appropriate solenoid valves within thousandths of a second,

setting the hydraulic system as required. Now the hydraulic fluid under a high level of system pressure of up to 90 bar is able to flow into the clutch master cylinder within fractions of a second, opening the clutch in the process. This, in turn, serves to activate four hydraulic cylinders in the gearshift actuator controlled by solenoid valves in the hydraulic unit. The four hydraulic cylinders then serve ultimately to shift the gears by way of four separate gearshift rods. And when shifting down, the engine automatically gives gas in between gears.

New SMG 20 per cent faster than before.
The third generation of SMG transmission now featured in the BMW M6 speeds up the gearshift process by no less than 20 per cent. Gears are shifted in a “flowing” process much faster than even an experienced driver would be able to achieve, with the interruption of power when shifting gears becoming hardly perceptible. The BMW M6 therefore accelerates from standstill to
top speed in a virtually ongoing surge of power and torque, as if there were no interruption whatsoever. Clearly, this means much greater pleasure of shifting gears for the driver, SMG offering an almost incomparable Formula1 experience.

A further advantage of the SMG gearshift is the increase in traffic safety: With gears shifting at the same persistent speed and in the same precise, absolutely reproducible process, the driver no longer has to concentrate on the gearshift as such. The result is an even more precise, safer and relaxed style of motoring.

Drivelogic: The driver chooses his particular SMG gearshift.
The Drivelogic function gives the driver a total of 11 gearshift options individually adjusting the SMG gearshift to the driver’s particular style of motoring. The first and most significant distinction between these driving programs is the pre-determined gearshift speed: The higher the program, the engine speed and load, the quicker the gearshift. Six of these 11 gearshift options come with the sequential manual gearshift function (S-mode) ranging from smooth and dynamic all the way to high-performance. And in the S-mode the driver always shifts gears by hand.

Launch control: Accelerating to top speed with full power all the way.
The launch control function in the S-mode supplements the purist and sporting M6 driving program, enabling the less experienced driver to accelerate

perfectly from a standstill, using all of the car's power and acceleration in the process. In this case you switch off DSC in advance.

Launch control serves to relieve the driver of the usual chore of shifting gears himself. So with the car at a standstill, all the driver has to do is push forward the selector lever and keep it there. Now, pressing the gas pedal, he automatically sets the engine to its optimum start-off speed. Then letting go of the selector lever, the driver enables his M6 to accelerate with ideal wheel spin management, provided he keeps his foot fully on the gas pedal. There is subsequently no need to shift gears all the way to the car's top speed, SMG with Drivelogic shifting gears automatically in each case shortly before maximum engine speed and thus moving up smoothly from first to seventh gear.

As in the S and D modes, a display in the cockpit activated during launch control informs the driver of the gear currently in mesh.

Automatic transmission straight from the race track.
Five of the 11 Drivelogic programs are available in the so-called automated D-mode in which the transmission shifts the 7 gears automatically. This it does as a function of the driving program currently in use, the respective situation on the road, the speed of the car, and the position of the gas pedal. Driving program D1, for example, sets off in second gear and ensures particularly sensitive operation of the clutch for smooth motoring and acceleration on, say, snowbound roads or quite generally in winter. The driver is able to influence this automatic gearshift by slowly taking back the gas pedal to shift up in the D-mode, too. Conversely, he is able to shift back quickly by pressing
the gas pedal all the way down. Both in the S- and D-mode, the transmission automatically shifts back to first gear as soon as the car comes to a
standstill. Then, to set off again, all the driver has to do is press the gas pedal.

Special functions for extra safety and comfort.
The seven-speed SMG transmission in the BMW M6 supports the driver not only in terms of optimum motorsport performance, but also by way of many safety features. In a critical situation, for example when shifting back on a slippery road, SMG opens up the clutch within fractions of a second to prevent high engine forces being transmitted to the drive wheels and causing the car to suddenly swerve.

An intelligent transmission on gradients.

Hill Detection modifies the gearshift points on uphill and downhill gradients: Driving uphill, this avoids a constant shift of gears up and down, driving downhill the function keeps lower gears in mesh for a longer period in order to capitalise on the engine's braking effect. And in the D-mode the Hill Detection function sets the gear chosen to the actual gradient encountered at any given point in time.

These functions are only possible thanks to the close link between the SMG control unit and the engine management system communicating directly with one another. This communication is provided by a high-performance CAN data bus connecting the MS S65 engine control unit with the SMG control unit networked to 12 redundant SMG sensors. The SMG control unit therefore receives all relevant data from the MS S65 “brain” on the current position of the gas pedal, wheel and engine speed, temperatures, the
steering angle, and Key Memory settings. And last but not least, SMG and DSC also communicate directly with one another.

4. The Chassis and Suspension of the BMW M6: Agile, Fast, Safe.

The chassis and suspension of the BMW M6 is based on the all-aluminium chassis of the BMW 6 Series suitably modified in its kinematics to the increase in engine power. Naturally, the very stiff bodyshell as well as the large number of aluminium components provide the ideal foundation for sheer driving pleasure at its best. Added to this there is the perfect balance of weight spread out on the front and rear axles and, of course, rear-wheel drive typical
of BMW and keeping the steering free of drive forces.

The M6 retains the basic geometry of the 6 Series suspension: Track measures 1,567 millimetres or 61.7″ at the front and 1,584 millimetres or 62.4″ at the rear, wheelbase is 2,781 millimetres or 109.5″. Featuring an increase in negative camber, wheel guidance and control meets the even greater demands made in this case in terms of driving dynamics and high loads.

Axle load distribution in perfect harmony is again typical of BMW, with 54 per cent of the car's weight on the front, 46 per cent on the rear axle. Added to this there is the unladen weight of only 1,710 kilos or 3,771 lb, combining ideal dimensions and ideal weight in a particularly dynamic blend. So with the BMW 6 Series already offering the perfect rendition of agility and dynamic performance, the BMW M6 enhances this driving pleasure to a significantly higher standard you initially would not even regard as possible.

Intelligent lightweight technology: Less mass – but extra strength and stiffness.
With the exception of components such as the tiebars, wheel mounts or bearing journals subject to high loads, the two-arm spring strut front axle is made completely of aluminium. The U-shaped front axle subframe takes up the steering mechanism, anti-roll bar, track control arms and pushrods. A multi-dimensional aluminium frame gives the front axle subframe maximum crosswise strength and stability, offering the advantage of particularly precise response to the steering.

The aluminium frame comes complete with two NACA intakes of the same type as used in motorsport or aviation. These openings allow cooling air to

flow through the front section to the transmission and other components without impairing the aerodynamic and streamlining qualities of the underfloor.

Servotronic with two control maps.
In developing the BMW M6 High-Performance Coupé, the engineers at BMW M GmbH have given particular attention to the steering system crucial to agile and safe motoring. Via special control maps, Servotronic steering management controls the degree of power assistance as a function of road and engine speed. This solves the basic conflict of interest between high power assistance for comfortable parking and low assistance in the interest of superior driving dynamics at high speeds, reducing the risk of the driver tearing too hard at the steering in a sudden manoeuvre.

Two different Servotronic control lines corresponding to the EDC mode currently in use allow two different configurations, one focusing on motorsport, the other on motoring comfort. In the former case with the sports-oriented control line, the steering is very direct giving the driver precise feedback under high lateral acceleration. This is important because of the extremely high speeds the M6 is able to reach in a bend. The comfort setting, in turn, places the emphasis on motoring comfort appreciated above all on long distances.
A common feature shared by both map control lines is that they maintain the basic characteristics and feeling of the steering.

Rear axle perfectly set-up in intelligent lightweight technology.
Made almost completely of aluminium, the Integral IV rear axle in the BMW 6 Series – a configuration absolutely outstanding in terms of both directional stability and comfort – has been adapted to the car's far higher level of performance through special elastokinematics as well as reinforced arms, guide bars and joints. The former rubber-dampened wheel guidance joints, for example, are replaced by rigid, solid joints offering a far higher standard of stability in the interest of even more precise wheel guidance. This also reduces temperatures in the final drive by up to 15 °C versus a conventional configuration, dramatically cutting back the thermal load acting on the axle components.

The final drive is connected to the SMG transmission by a two-piece propeller shaft featuring a Hardy disc at the front, a synchronising joint at the rear,
and a central bearing. The output drive shafts are made as torsionally stiff hollow pipes in the interest of minimum weight.

M Differential Lock for more driving pleasure and extra safety.

Like the BMW M3 and M5, the two other models in the BMW M Family, the M6 comes with its final drive comprising a variable, speed-sensing M Differential Lock. This gives the Coupé superior driving stability and optimum traction particularly when accelerating out of a bend.

A differential lock serves to build up locking action whenever required, for example if one of the two drive wheels threatens to spin. Such a differential lock is appreciated particularly by the sports-minded driver since it further enhances the advantages of rear-wheel drive on roads with an average or above-average frictional coefficient, where the driver prefers a sporting, dynamic style of motoring.

Superior traction in winter.
On a “normal” torque-sensing differential lock the overall drive power transmitted to the wheels depends on the momentum and forces conveyed by the wheel running on the more slippery side with a lower frictional coefficient. Wherever this frictional coefficient is particularly low, for example on snow, gravel or ice, the traction benefits offered by a conventional lock concept are limited by the restricted support forces. BMW’s Variable M Differential Lock, on the other hand, offers a decisive advantage in terms of traction even in very demanding situations, for example with the wheels running on totally different surfaces with a very significant difference in their frictional coefficient.
In combination with the carefully set-up DSC system and the well-balanced axle load distribution, this gives the M6 very good driving characteristics also in winter.

A further advantage of the Variable M Differential Lock lies in the fact that the system immediately builds up increasing locking action with an increasing difference in the speed of rotation on the two drive wheels. As a result, the wheel under less load – for example the inner wheel in a bend on a fast serpentine road – can no longer cause the drive forces conveyed to the wheels to “collapse”. Instead, the wheels consistently retain their drive forces and traction on the road.

Up to 100 per cent locking action.
BMW’s Variable M Differential Lock incorporates a shear pump spontaneously building up pressure as soon as the drive wheels start to run at a different speed. This pressure is transmitted via a piston to a multiple-plate clutch conveying drive forces to the wheel with better grip as a function of the difference in speed. In an extreme case all the drive power coming from the engine may be transmitted to the wheel with a better frictional coefficient.

As soon as the difference in speed between the two wheels starts to decrease, pump pressure is reduced accordingly and locking action is cut back. This self-adjusting pump system is maintenance-free and is filled with highly viscous silicon oil.

Benefitting from this advanced technology, the driver of the BMW M6 is able to set off much better and more smoothly on surfaces varying significantly in their frictional coefficient, since the wheels have far better traction.
The Variable M Differential Lock also improves the car's handling and driving stability in the interest of extra safety and driving pleasure.

M Generation DSC for extra safety.
The supreme driving dynamics and safety offered by the car's chassis and suspension may be optimised to an even higher standard in specific situations by a control system intervening in the suspension. BMW integrates these control systems within the overall concept of DSC Dynamic Stability Control specially configured for the BMW M6.

The task of these systems is to permanently monitor driving conditions and to intervene in the interest of extra stability wherever required. So it is fair to say that DSC is a special safety function taking the car and the driver to the very limits of physics.

Wherever necessary, DSC intervenes as required in engine management, reducing drive forces and/or activating the brakes on each wheel.
The result is a higher standard of driving safety, for example on slippery roads, in abrupt manoeuvres, or with the car starting to lose stability in a bend.

The special M Generation of DSC developed for the BMW M5 and M6 enables the driver to pre-select the dynamic driving programs in the MDrive mode, then calling up the program required via the MDrive button in the steering wheel. While the first stage of DSC in this case is basically the same as in the BMW 6 Series, the M Dynamic Mode is intended particularly for the very dynamic, sports-oriented driver.

M Dynamic Mode – an outstanding achievement in driving dynamics.
The M Dynamic Mode (MDM) sets a new standard in driving dynamics, offering the sports-minded and ambitious driver a revolutionary improvement in dynamic performance: This special sub-function of DSC reserved to BMW M Cars enables the driver to capitalise on the car's longitudinal and lateral acceleration by pressing the MDrive button in the steering wheel.

The driver using this option is quite literally limited only by the extreme laws of physics. DSC intervenes only when the car is driven to the absolute ex-

treme, thus allowing the driver to countersteer moderately while power-sliding through a bend at a controllable angle. Clearly, this means that the M Dynamic Mode should be used only on a race track closed to public traffic.

A warning sign in the instrument panel informs the driver that the M Dynmaic function is active. And there is also a warning signal informing the driver as soon as he deactivates the DSC function altogether.

Power button for extra output and performance on demand.
In many situations the driver does not need all the power and agility of his M6, for example in city traffic. Precisely this is why the more comfort-oriented
P400 power program is automatically activated when starting the engine, limiting engine output at that point to 400 bhp. Then all the driver has to do is press the MDrive button in the steering wheel or the Power button in the selector lever cover in order to call up all the power and performance of the ten-cylinder with its maximum output of 507 bhp. This modifies the kinematic response to the gas pedal, giving the car more sports-oriented performance for sporting and dynamic qualities in the P500 program and the full power and performance required for motorsport in the P500 sports program.

EDC: From firm and dynamic all the way to comfortable and smooth.
Adjusting EDC Electronic Damper Control, the driver is able to set the characteristics of the chassis and suspension as required from firm and sporting all the way to comfortable and smooth. This he does by the three Comfort, Normal and Sports programs selected via the MDrive button in the steering wheel or the push button next to the SMG shift lever. For all practical purposes, therefore, the driver is able to convert his BMW M6 at the touch
of a button into a thoroughbred driving machine, a sports car for everyday use, and a luxury coupe for grand touring in grand style.

EDC Electronic Damper Control ensures ongoing, infinite control of electronic damper forces over a very wide range of different settings. In the Normal program damper forces are automatically adjusted as required to specific driving conditions, the system providing an optimum combination of motoring comfort and driving safety.

The driver then has the option to pre-select the Comfort or Sports programs, varying damper characteristics accordingly. In the Sports mode the chassis and suspension respond to bumps on the road and uneven surfaces by building up higher damper forces to reduce body motion and give the M6 a much firmer grip on the road. In the Comfort mode, by contrast, EDC reduces damper forces in the interest of a higher level of motoring comfort. In

bends, when applying the brakes and when accelerating, higher damper forces enhance driving safety in all modes, improving body sway and dive behaviour of the M6 accordingly. A further benefit is the consistent maintenance of good vibration characteristics regardless of the load the car is carrying throughout
its complete lifecycle.

High-performance brakes like in motorsport.
Reflecting its outstanding performance, the BMW M6 comes with extra-large high-performance brakes featuring weight-optimised compound brake discs carried over directly from motorsport. Optimum arrangement and configuration of the holes drilled into the brake discs ensure excellent stopping power both in the dry and under wet conditions.

Brake disc dimensions are 374 x 36 millimetres (14.72 x 1.42˝) at the front and 370 x 24 millimetres (14.57 x 0.94˝) at the rear. Made of aluminium, the double-piston swing callipers optimised for low weight and enhanced stiffness significantly reduce unsprung masses and contribute accordingly to the car's supreme agility, safety and comfort on the road. As a result, the BMW M6 offers stopping distances otherwise seen only in motorsport, coming to a halt from 100 km/h within just 36 metres or 118 ft, and from 200 km/h within less than 140 metres (459 ft).

Diagnostic system measuring brake pad wear.
Determining brake pad wear at specific measuring points, a sensor transmits the data monitored to the DSC control unit. Then, as a function of the driver's style of motoring, the system determines the current state of the brake pads and forecasts the remaining mileage until the brake pads have to be replaced. This information is used for Condition Based Service in order to determine meaningful and appropriate service dates.

The wheels – simply outstanding in their looks and technical features.
The wheels on the BMW M6 are extra-large from the start due to the large brake discs. In terms of their looks, in turn, the19-inch forged aluminium wheels developed exclusively for the BMW M6 give the car even greater presence and appeal on the road. With their five contoured double-spokes, these wheels not only look delicate, but are 1.8 kilos lighter than conventional cast aluminium wheels.

Like the wheels, the car's tyres do not come off the rack, but were rather developed exclusively for BMW M in an elaborate series of tests: The front tyres measure 255/40 ZR 19, the rear tyres are 285/35 ZR 19. In their rubber compound and dimensions, the tyres are designed to precisely convey high lateral and longitudinal forces with a relatively high standard of roll
comfort on both dry and wet surfaces. They also offer appropriate feedback

to the driver, allowing him to push the car to its physical limits whenever he wishes, without sacrificing safety in the process.

Tyre repair system taking the place of a spare wheel.
The tyre repair system comes complete with BMW's Tyre Defect Indicator as well as the second-generation MMS M Mobility System. Providing both a visual and acoustic signal, the Tyre Defect Indicator warns the driver of a sudden or gradual drop in pressure in one of the tyres.

Featuring appropriate hump geometry, the rims prevent even an empty tyre with zero pressure from "jumping off" the wheel, thus allowing the driver to safely stop the car in the event of a puncture. The MMS M Mobility System then serves to seal holes in the tyre of up to 6 millimetres, allowing the driver to proceed safely to the next workshop.

This means that in practice the driver is able to repair virtually all punctures without having to change the wheel right away, so that the BMW M6 does not require a spare or emergency wheel. The result is a decrease in weight of more than 20 kilos compared with a full-size spare wheel, obviously helping to improve the car's power-to-weight ratio and driving dynamics.

5. Body, Design, Equipment: Light and Safe, Sporting and Luxurious.

The body of the BMW 6 Series offers all the qualities and features required for the BMW M6: The body dimensions are perfectly suited for accommodating the ten-cylinder and all its ancillaries, without requiring any major modifications. Likewise, the innovative body structure with its efficient combination of steel, aluminium and plastics offers everything required to match the enhanced power and performance of the BMW M6. So that in a nutshell, the term “intelligent lightweight construction” is most appropriate in this context.

Lean and clean: Optimum blend of materials.
“Intelligent lightweight construction” means using the right material at the right place. On both the BMW 6 Series as such and in the M6 in particular, the weight-reduced front section of the car cuts back overall weight by approximately 45 kg or 99 lb versus a conventional steel structure at the front. The spring supports resting in the front axle and dampers are likewise made of a pressure-cast aluminium alloy, just as the doors and front lid are made of aluminium. The front side panels, in turn, are thermoplastic, the rear lid is made of an SMC sheet moulding compound. And last but not least, tailored rolled blanks also help to save weight by gearing the metal plates and panels used precisely to specific requirements at each point.

Despite the very good starting point already provided by the “basic” 6 Series, the objective in developing the M6 was to shed all further weight not absolutely essential in the interest of supreme agility and handling. But this was not to detract from the car’s comfort, roominess, and everyday motoring qualities.

Losing weight gram-by-gram for supreme agility.
Following this philosophy, the engineers at BMW M were indeed able to reduce the weight of the M6 by a few more kilos, the improvement of axle load distribution and the car’s centre of gravity achieved in this way significantly enhancing the agility of the M6 on the road, dry weight now being limited to a mere 1,710 kilos or 3,771 lb. But when it comes to active and passive safety, the M6 naturally retains all the qualities of the “basic” 6 Series without any restrictions.

Roof made of carbon, the No 1 material in Formula1.
The engineers at BMW M have saved more than 4.5 kilos on the M6 by giving this new Sports Coupé the same kind of roof as on BMW's already legendary M3 CSL, a purist driving machine successfully setting standards above all
in lightweight technology: Like the M3 CSL, the M6 comes with a roof made of carbon, a high-tech material carried over from Formula1. Carbon-fibre-reinforced plastic (CFP), to use the full term, has a density of approximately 1.5 kg per cubic decimetre, as opposed to 2.7 kilos per cubic decimetre in the case of aluminium.

Again by comparison, conventional steel is four times heavier than carbon, weighing approximately 7.8 kilos per cubic decimetre. A further important point that every kilo saved especially on the roof has a very positive effect on the car's driving dynamics: With the weight of the roof being reduced by 50 per cent versus a conventional steel structure right at the "top" where it really counts, the car's centre of gravity is lowered accordingly. The benefit for the customer is higher speed in bends and further reduction of body dive and sway.

Innovative production technologies also in series production.
To provide a particularly attractive eye-catcher demonstrating the close connection between BMW's large coupe and motorsport, the use of carbon on the roof of the M6 is clearly visible from outside. A further advantage provided by the carbon roof is the option to use a particularly light and thin rear window. And unlike the "regular" 6 Series, the roof as a whole is not welded, but rather bonded, on to the body of the car, while still retaining full body stiffness and safety, with the same noise and temperature management as on the 6 Series as such.

BMW incidentally builds the carbon roof in-house, lightweight construction experts at the Landshut Plant making the roof out of several layers of this precious material initially pre-formed in dry state, then soaked in resin in a resin transfer moulding (RTM) process, and finally treated with a layer of clear topcoat. Contrary to theM3 CSL built only in very small numbers, the CFP roof on the BMW M6 marks the first use of this technology in series production.

Less weight at the ends for enhanced agility and handling.

The bumper supports front and rear are also made of CFP in a unique process developed by BMW and applied at the Landshut Plant. In this process unparalleled the world over, strips of CFP are woven layer-by-layer around
a core, cast into resin and hardened before the core material is subsequently removed. This provides an extremely light but highly stable hollow-profile

support which, in its function and effect, is quite comparable to a conventional support made of steel or aluminium. The weight saving of 20 per cent at the front and 40 per cent at the rear where such a reduction in weight really counts significantly enhances the car's agility and handling, providing higher speeds above all in bends.

Kilos per horsepower – the formula for the performance athlete.
All the efforts made to save weight are ultimately confirmed by a good power-to-weight ratio stating what mass (weight) the engine is ultimately required
to accelerate. While the mass of a car can be matched in terms of longitudinal dynamics (acceleration and deceleration) by adding extra power and using even more efficient brakes, a reduction of the car's overall mass improves both longitudinal and lateral acceleration at the same time. In practical terms, therefore, a lighter car is faster in a straight line, achieves higher speeds in bends, and requires shorter stopping distances. Hence, the power-to-
weight ratio of a car says much more about its driving dynamics than just the power or torque rating as such in bhp or Newton-metres.

The BMW M5 Sports Saloon boasts a power-to-weight ratio of 3.5 kg:bhp, making it the benchmark in its class. Now, benefitting from its design and consistent lightweight technology, the M6 Coupé is another 45 kilos or 99 lb lighter than the M5. Featuring the same engine, therefore, BMW's Sports Coupé comes with a sensational power-to-weight ratio of only 3.3 kg:bhp. This makes the BMW M6 one of the absolute leaders in the high-performance sports car market.

Efficient cooling – a particular challenge.
The supply and extraction of cooling air is a particular challenge in motoring, above all with a car of this calibre. Precisely this is why the BMW M6 comes with an all-new cooling and air supply package featuring a high-performance fan, engine radiator, a/c capacitor, power steering fluid cooler and engine oil cooler all positioned directly behind the car's front air dam. For reasons of the car's package, in turn, the engine oil cooler is fitted at an angle in front of the radiator and the radiator itself is split up into two sections.

The large air openings in the front air dam for cooling and intake air are particular eye-catchers. The side openings to the left and right of the

large central air scoop, in turn, ensure efficient intake of secondary air flowing to the engine of the BMW M6.

The exterior – proud understatement all the way.

The BMW 6 Series also sets the standard in the segment of luxury coupes, its successful synthesis of high-performance ethnology and elegant, powerful looks thrilling customers the world over.

Given qualities of this kind, it was obvious from the start that the technical modifications and improvements introduced on the M6 were not to significantly change the looks of the car. The designers and development specialists at BMW M therefore faced the task to give the M6 a truly unique look, while
at the same time retaining the beautiful appearance of the BMW 6 Series. Precisely this is why the changes in design are relatively discreet but nevertheless consistent, clearly underlining the self-confident character of the car: Wherever the BMW M6 makes its appearance, it represents the status
of a very dynamic and powerful-high-performance coupé without bragging or flaunting its muscle. In other words, this is the perfect rendition of performance, design and driving pleasure so typical of BMW's M Philosophy.

Muscular, dynamic, elegant.
Extending down close to the road, the front air dam is powerful in its design and comes with large air intakes feeding air to the high-speed engine. Flaps on the front air dam serve to reduce lift forces on the front axle, the minimisation of lift forces thus guaranteeing superior driving stability also at high speeds.

Powerful proportions also from the side.
Very low and muscular in their appearance, the side-sills are more aggressively contoured than on the "basic" 6 Series. Through their interplay of light and shade, they accentuate the length of the car and generate a very dynamic impression.

Again, this modification serves both optical and, in particular, technical purposes: The side-sills optimise the flow of air along the underfloor and improve the car's aerodynamic qualities. The underfloor itself, finally, has also been optimised for perfect aerodynamics through the addition of appropriate panels.

Like every M Car, the BMW M6 comes with exclusive wheels: In this case these are19-inch forged aluminium wheels with five almost delicate double-spokes providing a clear view of the brake discs and swing callipers on the brakes.

Ensuring an extremely sporting touch, this design gives the silhouette of the BMW M6 a very light and nimble appearance. And the word “light” is indeed appropriate, with the wheels weighing 1.8 kg or 4.0 lb less than comparable, light-alloy wheels. Tyre dimensions, finally, are 255/40 ZR 19 at the front and 285/35 ZR 19 at the rear.

Superior aerodynamics to the last detail.
The BMW M logo in the ornamental slats at the side with the integrated direction indicator clearly bears testimony to the car's sophisticated origin. And the M6 also differs from the "standard" 6 Series through its exterior mirrors accentuating the sporting looks of the car through their striking design and interaction of light. Here again, the rule applied is that form follows function, the design of the exterior mirrors developed in the wind tunnel serving to reduce lift forces on the front axle.

The rear diffuser on the rear air dam as well as flaps to the left and right of the diffuser accentuate the particularly powerful and dynamic look of the car. The rear light units in the bumper are slightly higher up than in the regular model, the numberplate is integrated in the rear air dam. The most significant eye-catcher at the rear, however, is of course the four round tailpipes so typical of all BMW M Models.

The rear diffuser fulfils a fundamental function in the guidance of air along the underfloor: Improving flow conditions in conjunction with the spoiler discreetly integrated in the luggage compartment lid and the smooth underfloor, the diffuser helps to give the car a very good drag coefficient with a further reduction of lift forces. And at the same time the diffuser improves the extraction of cooling air from the final drive.

Battery in the luggage compartment.
Housed in the luggage compartment, the AGM battery helps to give the M6 its good front-to-rear weight balance. The special advantages of this kind of battery lie in its charging behaviour, with a charge cycle three times higher than with a conventional battery in the interest of a longer service life.

The 70-litre (16.3 Imp gal) fuel tank made of a special plastic material is fitted in front of the rear axle, the double- and suction-jet pump controlled on-demand as a function of pressure ensuring a reliable supply of fuel also under powerful longitudinal and lateral acceleration.

Indianapolis Red exclusive to the M6.
The paintwork of every new BMW Model is naturally a great tradition upheld by BMW M GmbH. So now the BMW M6 is coming with the most sporting and dynamic paintwork colour conceivable: Indianapolis Red. Other colours are Sepang Bronze, Interlagos Blue, and Silverstone II M metallic, as well as two further options from the BMW 6 Series colour range. Added to this,

there is also Alpine White non-metallic paintwork. The M6 logo is to be admired on the ornamental slats in the side panels, on the rear lid, and on the illuminated door strips.

Interior: combining the character of a sports car with a touch of noblesse.
The BMW M6 is a thoroughbred sports car. But offering a superior level of equipment, it also comes with the noblesse you would expect of such an exclusive coupé. This ranges from ample space in such a 2+2-seater all the way to active and passive safety features on the high level of the BMW 6 Series.

A total of six airbags fitted as standard, highly efficient belt systems, BMW's intelligent Advanced Safety Electronics (ASE) as well as an automatic or manual emergency call function via BMW Assist are all available just in case.

In all, this system offers the occupants of the BMW M6 truly outstanding safety in a collision. And the new model does not even make any compromises when it comes to luggage capacity, with its luggage compartment offering a volume of 450 litres.

Dynamic Harmony combined with a touch of sportiness.
The philosophy of BMW M within the interior is that of "Dynamic Harmony". "Dynamism" applies to the tension and motion of individual surfaces and lines. "Harmony" stands for the way in which the surfaces and lines enhance and relate to each other. In the M6 this Dynamic Harmony is further enriched by a touch of the sportiness appreciated so much by BMW aficionados the world over. In particular, this sporting look is based on the careful choice of exclusive materials and their dynamic design.

The BMW M6 comes as standard with an extended range of leather in exclusive Merino quality available in Black, Silverstone, and Sepang. This leather upholstery comprises the seats, the centre console and handbrake lever handle as well as the door panels, armrests and door handles. At the rear the side panels are additionally finished in leather.

As an option the M6 is available with an even wider range of full Merino leather upholstery in no less than five colours (Indianapolis Red and Portland Natural Brown over and above the colours already mentioned). Particular highlights in this case are full leather upholstery on the dashboard in soft nappa (also on
the door and rear side panels) as well as the roofliner in Alcantara Anthracite.

Within the range of trim strips and panels, the connoisseur has the choice of optional Pianopaint Black as well as Madeira and Carrara wood trim.

Driver-oriented cockpit.
Again reflecting the typical style and character of BMW, the cockpit is clearly oriented to the driver: All functions important to the driver are positioned ergonomically on or around the steering wheel. Nearly all functions relevant also to the front passenger, in turn, are concentrated around the centre console.

The centre console also houses the Controller within a special binnacle designed specifically for the M6, serving to activate and mastermind nearly all comfort functions via the Control Display. This special Controller differs in both its looks and surface touch from the Controller in the BMW 6 Series.

Perfect seats for sports motoring.
Both the driver and front passenger enjoy perfect seating conditions in the BMW M6. The body-contoured M sports seats featured as standard ensure optimum body support particularly under dynamic driving conditions, adjusting electrically for length, height, seat bottom and backrest angle. Headrest height and angle, in turn, are adjustable manually.

An electrically operated lumbar support is included in the seats. With its infinitely variable system of air chambers, this support helps the passengers find their perfect seating position in orthopaedic terms, supporting their back muscles and taking the load off their backbone.

A special development for the BMW M6 is adjustable backrest width incorporating pneumatic adjustment features. Another highlight fitted as standard is three-stage seat heating quickly warming up the body surface on both the seat bottom and backrest as well as the side supports.

A fully-fledged 2+2-coupé.
The passengers riding on the rear seats of the M6 also enjoy a first-class experience for a coupé, particularly in comparison with the usual sports car standard. Even adults find sufficient space here for shorter distances. The two deeply contoured leather seats separated in the middle by a seat cushion, together with the contoured backrests, ensure good side support. And thanks to BMW’s convenient Comfort Access, both rear seats can be reached easily and without twisting your body on either side.

Another practical highlight of the M6 is the large luggage compartment offering 450 litres capacity – enough for a complete set of one large,

one medium and one small hard-shell suitcase or a large suitcase and two 46-inch golf bags. The ski-bag in the middle section of the rear seat backrest,

in turn, enables the wintersport enthusiast to take along two pairs of skis or a snowboard. Additional storage compartments in the doors, nets on the seats and further storage options within the M6 ultimately round off this wide range of versatile and highly practical storage amenities.

Cockpit complete with formula flair.
Both the speedometer and rev counter come in chrome surrounds on the dashboard. In their design, the instrument faces in black and with white numbers, together with the needles in traditional BMW M Red, provide a clear sign of distinction. The white Corona lights are switched on permanently.

A unique feature is the engine speed band presented in the rev counter, the yellow pre-warning field and the red warning field limiting the permissible range of engine speed as a function of the current engine oil temperature. The telltales, oil level indicator, mileage counters as well as the SMG display together with the gear and Drivelogic display come between the speedometer and rev counter.

For the first time the engineers at BMW M GmbH have succeeded in ensuring very precise oil level indication by means of a new display instrument
featuring an electronic control unit replacing the conventional oil dipstick. Whenever necessary, the driver is requested by an acoustic and optical signal to fill up engine oil.

Head-Up Display presenting specific M information.
The optional Head-Up Display (HUD) presents important driving information directly in the driver’s line of vision. With its special configuration, HUD allows the driver himself at the touch of a button to choose either the standard display or specific M information.

The M-specific display highlights the dynamic engine speed band, which, with its Shift-Light function, tells the driver when he has reached the optimum point for shifting gears. This function is carried over from Formula1 and is supplemented by a clear indication of the gear currently in mesh as the well as the car’s road speed.

The M leather steering wheel rests pleasantly in the driver’s hands, re-designed and re-located SMG paddles enabling the driver to shift gears

at the touch of a finger. The big advantage is that he constantly keeps the steering wheel in his hands in the interest of traffic safety particularly at high speeds and on winding roads.

MDrive for even greater motoring comfort.
The MDrive function is activated by the MDrive button in the steering wheel. Using this function the driver is able, at the touch of a finger, to turn this relatively comfortable coupé into a thoroughbred sports car and vice versa. All he has to do in this case is call up the dynamic driving settings previously configured in the MDrive menu of the iDrive system. These pre-settings can be stored in the Key Memory for particular convenience.

MDrive allows the user to pre-select or activate the following functions:
– The Power button serving to control engine characteristics – that is engine output and response – in three stages.
– SMG Drivelogic for selecting one of the six sequential or five automatic gearshift programs – here again, the driver benefits from direct activation of the driving/gearshift program required in each case.
– DSC Dynamic Stability Control with its two dynamic driving programs.
– EDC Electronic Damper Control with the programs Comfort, Normal, and Sports.
– And last but not least, the HUD Head-Up Display.

SMG selector lever with illuminated lever position indicator.
The searchlights and position indicator in the selector lever are activated as soon as the driver switches on the ignition. Next to the SMG selector lever there are four push buttons for direct control of the Power, DSC, EDC and Drivelogic dynamic driving functions.

With just a few exceptions, the customer opting for the BMW M6 has the full choice of all equipment and customisation features already available on the BMW 6 Series. In particular, these are BMW's Adaptive Headlights with the headlight beams following the road ahead as if by magic through an automatic control function as well as BMW Cruise Control.

Last but certainly not least, Automatic Air Conditioning with Automatic Air Recirculation adjusting to the desired temperature set by the driver and his passengers and then consistently maintaining this temperature at the desired level sets the standard also in the M6. This system comes complete with various comfort functions such as an integrated solar sensor, an anti-mist sensor, as well as external air supply and air recirculation filters.

6. Production of the BMW M6: High-Tech and Individual Style in One.

The new BMW M6 is built exclusively at BMW's Dingolfing Plant, the largest of the 22 BMW Group production plants worldwide. Here some 22,000 associates build more than 1,000 BMW 5, 6, and 7 Series a day, using the most flexible operating structures and large-scale production technology for the production of highly customised cars tailored individually to each purchaser.

Bodyshop.
The body-in-white of the new BMW M6 is built on the same facilities as the body of the BMW 6 Series Coupé and the BMW 6 Series Convertible, highly flexible robots and intelligent control systems serving to assemble and complete the individual body variants one-by-one in any random order. In the process the BMW M6 benefits from innovative bonding and joining technologies used in regular production of the BMW 6 Series.

Specific components exclusive to the M6 are fitted indirectly in the production process, additional mounting points and bolts, for example, being provided
on the body structure in order to take up the output of the M6's power unit. The roof bracket made of carbon-fibre-reinforced plastic (CFP) is bonded into position manually without extending the production process or the assembly time required. This provides the foundation for the roof made of carbon,
the same material used in Formula 1 and, of course, on the already legendary M3 CSL. Each kilo saved in this way has a positive effect on the car's
driving dynamics and fuel economy, at the same time raising that sheer driving pleasure so typical of BMW to an even higher level.

The body structure with its combination of steel, aluminium, and plastics also makes a significant contribution to the supreme agility offered by the new BMW M6. The low-weight aluminium front section, for example, connected directly to the steel bodyshell of the car, is made of aluminium panels, extrusion pressure profiles, internal high-pressure-moulded tubes, and aluminium castings, together with some 600 rivets and several metres

of protective gas welding seams. The doors and the engine compartment lid are also made of aluminium, the front side panels come in a special thermoplastic material, and the rear lid is made of SMC sheet moulding compound. The result is a car body which, through its ideal distribution and axle loads, enhances the dynamic features of the BMW M6 in every respect.

Paintshop: seducing your senses.

The BMW M6, despite its wide range of different body materials, goes through all the usual processes in applying the paintwork. The first step is to remove grease from the body by pre-treatment in a rotation dip bath, after which the body is cleaned and covered by a layer of zinc phosphate forming the foundation for the paint layers to follow next. Then the phosphated body- shells are covered by a layer of anti-corrosive paint in the cathodic dip bath (CDP) and are dried at 180 °C. The second layer of paint, a filler already matching the subsequent topcoat, is subsequently applied by high-speed rotation sprayers. This forms the foundation for the next layer of water-based paint applied on a special paint line in order to give the car its actual body colour. In this process a highly flexible paint supply system able to work with very small quantities of paint serves to apply the four exclusive M colours
as well as the overall range of approximately 250 individual colours, ensuring excellent quality throughout the entire process. After the body has been
dried in an intermediate dryer at a temperature of 70 °C the clear powder paint applied in conclusion gives the surface a beautiful glossy finish and adds the right kind of protection.

The Paintshop in Dingolfing uses a number of innovative concepts for the specific combination of materials on the BMW 6 Series. Thanks to flexible production management, for example, the SMC components – such as the rear lid – can be fitted right from the start in the Bodyshop and remain on the car throughout the entire painting process. The thermoplastic side panels, in turn, are the first skin segments of the body which go through the entire process of applying the paint right from the start, thus setting off the varying degree of thermal elongation of plastics and the aluminium front section during the subsequent drying process, since automatic recognition of materials enables the topcoat dryers to adjust their temperature within a few seconds.

An efficient and highly innovative process of colour-matching measures the colours on the body work online, ensuring perfect harmony of colours on both the body and on individual add-on parts such as the bumpers, side-sills or rear-view mirrors.

Assembly: a dream becomes reality.

While job processes in the Pressing Shop, at the Bodyshop, and at the Paintshop are largely automated, the human “touch” still comes first in the Assembly Area. Here, therefore, appropriate qualification and motivation of the associates working on the line provide the foundation for perfect production of customised cars of the highest quality. In their work these associates are supported by the latest technologies and particularly ergonomic

job conditions: Depending on the work to be done, car bodies can be turned and swivelled to the best position for optimum access, and may also be raised and lowered as required. With associates being able to “ride along” on the production line and use hydraulic handling units for effortless transportation of heavy components such as seats, doors, or batteries, working conditions are again facilitated to the greatest possible extent.

Like all other components on the BMW 6 Series, special parts and components exclusive to the M6 – such as the engine, the seats, the steering wheel, and the rear axle – are delivered to the assembly line just in sequence. Only the roof proudly showing that it is made of reinforced carbon-fibre is bonded on to the ready-painted body of the car in a separate process prior to assembly as such. At the same time the BMW M6 comes with an extra-thin rear window helping to reduce weight to a minimum, while not in any way detracting from the car’s body stiffness, its structural safety, or its noise and temperature insulation.

Various function tests and fine-tuning routines are conducted in the last stage of assembly, the finish process, before the car is cleared for delivery to the customer.

Innovative carbon-fibre technology with proven benefits in series production.
BMW builds the carbon-fibre roof of the M6 in-house, using special facilities at the Landshut Plant, where lightweight technology experts make the roof out
of several layers of this expensive material first pre-moulded in a dry state, then moistened with resin in the RTM (resin transfer moulding) process, and finally finished.

BMW already featured a reinforced carbon-fibre roof for the first time in a limited edition on the M3 CSL. Now, introducing the M6, BMW has gone one step further, for the first time integrating CFP technology in the production of a larger number of models.

The front and rear bumpers are also made of CFP for the first time in a special process developed specifically for this purpose at BMW’s Landshut Plant
and remaining unique the world over to this day. In this process the individual segments of CFP are woven layer-by-layer around a core, cast in

resin, and subsequently hardened before the core material is removed. The result is an extremely light, but nevertheless extra-strong hollow profile substrate reducing weight by 20 per cent at the front and 40 per cent at the rear in the interest of significantly enhanced agility and handling.

The Customer-Oriented Sales and Production Process: punctual, quick, dependable.

The BMW Group has set new standards with its Customer-Oriented Sales and Production Process, a unique concept ensuring simple ordering modalities for the customer, a high level of flexibility in making changes up to six days before the start of assembly, precise deadlines maintained in all cases, short delivery periods and much shorter flow times at the Plant. In this case the process is determined not by the vehicle as such planned by BMW in a general production cycle, but rather by the car the customer himself wishes to have and specifies precisely in his order.

Instead of a rigid, pre-determined sequence of production from the Body-shop via the Paintshop to Assembly, the ready-painted body is treated like a component supplied from outside, being kept on hold in buffer areas and delivered to the assembly line just-in-sequence. The customer's order is therefore only allocated specifically to a certain body upon the beginning of assembly.

7. Positioning of the new BMW M6.

The average BMW M6 customer in Europe is male, over 45 years old, married, and lives in a two-person household. He has a high level of education and
has an above-average income in his profession – usually as a self-supporting businessman or a very successful executive. The successful manager who
has already withdrawn from professional life is also a typical purchaser of such a car, as BMW knows from experience.

Normally the owner of a BMW M6 has other cars in his household and uses various vehicles for various purposes. The typical M6 customer is more lifestyle-oriented and extroverted than others, attaching very great significance to the design and performance of his car. But he also drives such an exclusive car to underline his social status.

Emotional factors are more important in choosing a BMW of this calibre than, say, practical, let alone rational, motives. Particularly the passionate aficionado of motoring is thrilled by a car of this kind, enjoying technical features such as SMG transmission, Formula 1 technology and BMW MDrive.

The three biggest markets for the BMW M6 are the USA, Germany and Great Britain.

Particularly in the USA, the potential M6 customer will focus on sheer driving pleasure in typical BMW style as well as the special feeling of driving a truly outstanding European sports car.

The M6 customer in the USA is slightly older on average than the European buyer of an M6, but still much younger than the average BMW purchaser in general. Some purchasers – albeit not many – of the M6 in the USA are indeed women. And here again, customers in this category normally have approximately three cars at home in their garage.

In the USA the BMW M6 also appeals to customers coming from the so-called New Money class. These are people who, having worked hard and successfully for many years, have gained a high level of material prosperity, thus making their “American Dream” come true.

8. Heritage of the BMW M6: Its Predecessors are already Legends: The BMW M635CSi and the BMW M1.

From the start, BMW M has been a synonym of the exclusive high-performance sports car. Now the new BMW M6 is continuing this tradition, setting a new standard in this segment with its combination of sporting qualities and elegant style.

Although the M6 does not really have any direct predecessors, former, similar models in the history of BMW already rank as legends in their own right.
Back in 1978, for example, the BMW M1 – now an expensive collector's item – was the first car to show how technology from motorsport can be conveyed
to the road.

Six years later it was followed by the BMW M635CSi, the first M car based on a BMW production model – and, at the same time, the car acknowledged as the founder of today's M family quickly growing over the years through the introduction of the BMW M5 (also in 1984) and the BMW M3 (1986).

An uncompromising, mid-engined two-seater sports car, the BMW M1 certainly had its DNA in motorsport. Conceived for racing and, indeed, highly successful on the track, the M1 came right at the beginning of a long story of BMW M cars.

The BMW M1 was powered by a 3.5-litre straight-six developing 277 bhp or 204 kW and featuring a four-valve cylinder head taken straight from BMW's wide experience in motorsport. This fascinating car accelerated to 100 km/h in just 5.6 seconds and had a top speed of 262 km/h or 161 mph.

Starting in 1979, the BMW M1 marked the start of the ProCar Series, a special series of races accompanying European Formula 1 events. Since this required homologation of the M1 for motorsport, there was also a road-going version, total production of the M1 amounting to 456 units.

The BMW M635CSi, the most powerful version of the 6 Series at the time built from 1984 – 1989, was not quite as fast, but definitely just as fasci-

nating. So it is no surprise that many dedicated connoisseurs were simply thrilled
by the idea of combining the legendary power unit of the M1 with the body of BMW's luxurious, 2+2-seater coupé.

Offering even more power than before, the engine of the M635CSi developed maximum output of 286 bhp (210 kW) and accelerated the car to 100 km/h
in 6.4 seconds, with top speed of 255 km/h or 158 mph. Fitted with a catalytic converter and with a corresponding reduction in power to
260 bhp/191 kW, this BMW was also sold in the USA as the M6.

Specifications.

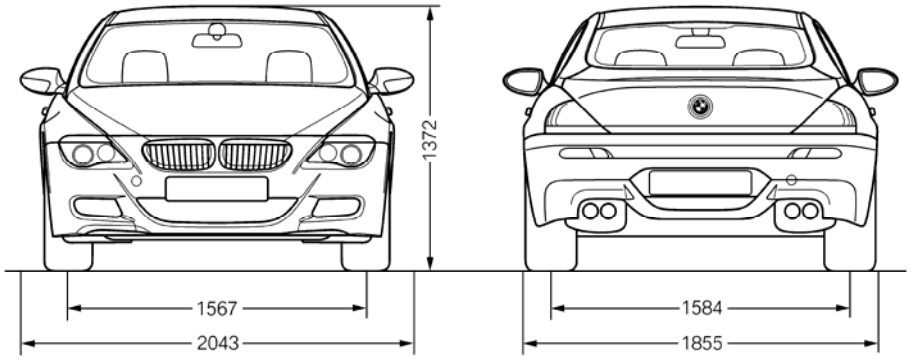
Body			**M6**
No. of doors/seats			2/2 + 2
Length/width/height (unladen)		mm	4,871/1,855/1,377
Wheelbase		mm	2,781
Track, front/rear		mm	1,567/1,584
Turning circle		m	12.5
Fuel tank capacity/range		approx. ltr	70
Cooling system incl. heater		ltr	15.0
Engine oil		ltr	13.0
Transmission fluid		ltr	1.2
Final drive fluid		ltr	2.6
Weight, unladen (EU)[1]		kg	1,710
Max. load (DIN)		kg	415
Max. permissible weight (DIN)		kg	2,200
Max. permissible axle load front/rear		kg	1,090/1,200
Max. trailer load[2]			
braked (12%)/unbraked		kg	–
Max. roof load/trailer nose weight		kg	–
Luggage comp. capacity, VDA		ltr	450
Drag coefficient		c_X x A	0.32 x 2.15
Engine			
Layout/No. of cylinders/valves			V 90/10/4
Engine management			MS S65
Displacement		cc	4,999
Bore/stroke		mm	92.0/75.2
Compression		:1	12.0
Fuel grade[3]		RON	95–98
Max. output		kW/bhp	373/507
At engine speed		rpm	7,750
Max. torque		Nm	520
At engine speed		rpm	6,100
Electronic			
Battery/location		Ah/–	90/Boot
Alternator		A/W	1,70/2,380
Chassis			
Front suspension			Double-joint thrust-rod spring strut axle in aluminium; compensation of transverse forces; anti-dive.
Rear suspension			Integral axle (aluminium), wheel suspension with special effect anti-squat/anti-dive
Brakes, front			Single-piston floating-caliper disc brakes
Diameter		mm	348, vented
Brakes, rear			Single-piston floating-caliper disc brakes
Diameter		mm	345, vented
Driving stability system			ABS, DSC, CBC
Steering			Rack-and-pinion, power-assisted
Overall ratio		:1	12,4
Type of transmission			SMGIII
Transmission ratio	I	3.985	3.985
	II	2.652	2.652
	III	1.806	1.806
	IV	1.392	1.392
	V	1.159	1.159
	VI	1	1
	VII	0.833	0.833
	R	3.985	3.985
Final drive ratio		:1	3.62
Tyres, front			255/40 ZR19
Tyres, rear			285/35 ZR19
Wheels, front			8,5J x 19 EH 2 IS 12 Alu
Wheels, rear			9,5J x 19 EH 2 IS 28 Alu
Performance			
Power to weight ratio (DIN)		kg/kW	4.6
Output per litre		ltr/kW	74.6
Acceleration	0–100 km/h	s	4.6
In 4th/5th gear	80–120 km/h		4.4/5.8
Top speed		Km/h	250[2]
Fuel consumption (EU cycle)			
urban		ltr/100 km	22.7
extra-urban		ltr/100 km	10.2
composite		ltr/100 km	14.8
CO_2		g/km	357

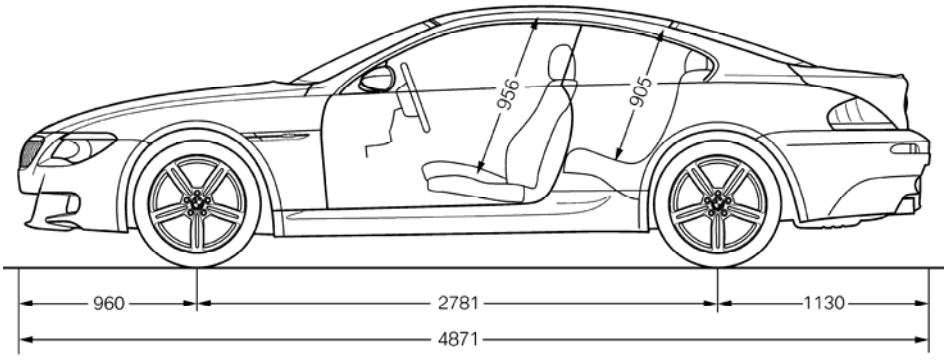
Miscellaneous

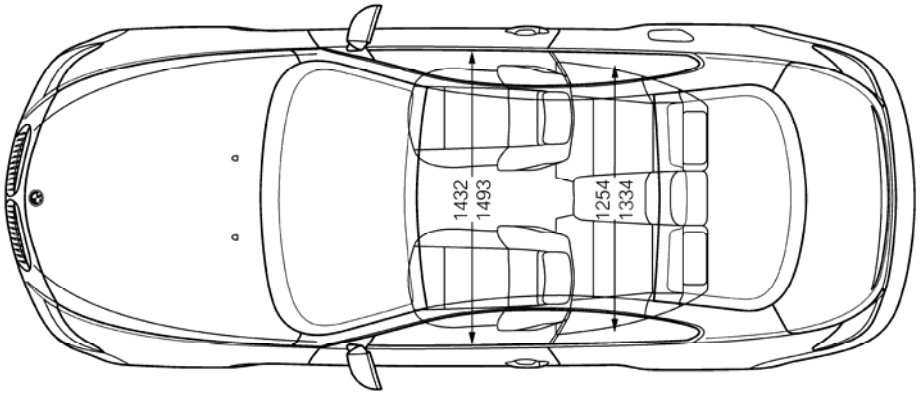
Emission classification

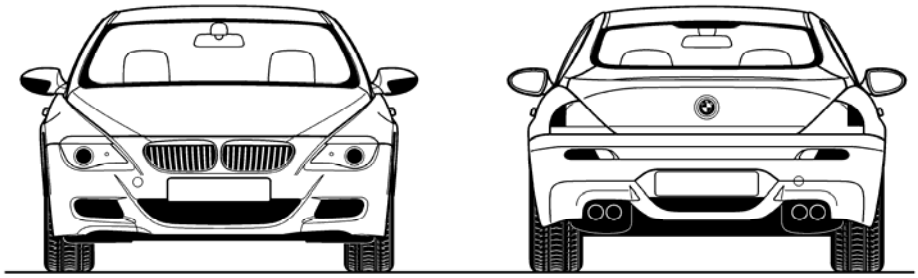
The values given in parenthesis apply to the automatic transmission.
[1]Weight of the car in road trim (DIN) plus 75 kg for driver and luggage.
[2]Deviations are possible under certain conditions.
[3]Performance and consumption figures relate to RON 98.

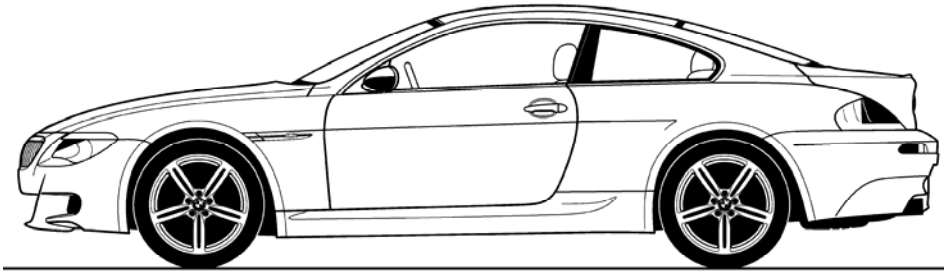
10. Exterior and Interior Dimensions.

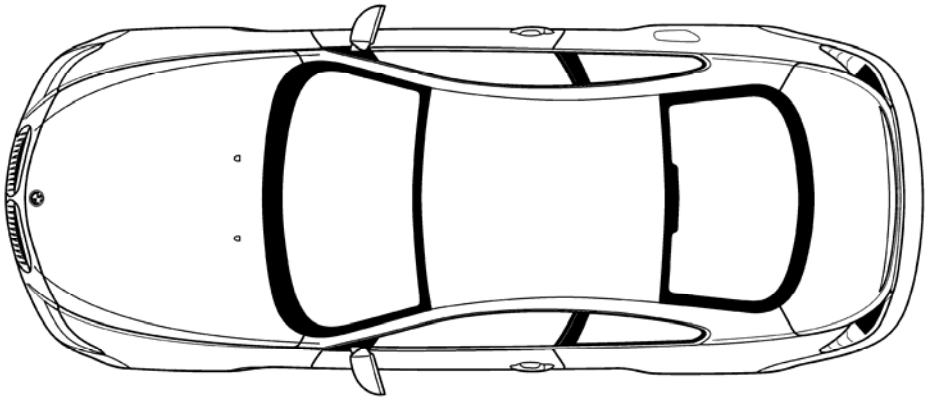












11. Output and Torque Diagram.