

# BMW ActiveHybrid 7. Contents.



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# 1. Description in Brief.



- BMW presents the most dynamic and luxurious rendition of the hybrid car. BMW ActiveHybrid 7 sets new standards for efficiency in the luxury class and uses the interaction of the gasoline engine and the electric motor in a concept unique the world over to provide an absolutely innovative form of the Sheer Driving Pleasure so typical of the brand.
- BMW ActiveHybrid 7 combines a V8 gasoline engine featuring BMW TwinPower Turbo Technology with a three-phase synchronous electric motor, developing overall system output of 342 kW/465 hp and maximum torque of 700 Newton-metres/516 lb-ft. This intelligent combination in a mild hybrid concept promotes both the efficiency, the dynamic performance and the supreme driving comfort of this luxury saloon, with BMW ActiveHybrid 7 accelerating to 100 km/h in just 4.9 seconds and reaching a top speed – electronically limited – of 250 km/h or 155 mph. At the same time average fuel consumption in the EU test cycle is a mere 9.4 litres/100 kilometres or 29.1 mpg imp, while the CO<sub>2</sub> rating is 219 grams per kilometre.
- BMW ActiveHybrid technology featured in the BMW 7 Series luxury saloon is made up of a three-phase synchronous electric motor, a lithium-ion battery, and the power electronics required for the high-voltage on-board network. All components represent the latest state of the art worldwide in hybrid technology. BMW ActiveHybrid therefore expresses BMW's leadership in drivetrain technology in the same way as the eight-cylinder power unit and the eight-speed automatic transmission featured in BMW ActiveHybrid 7 rounding off this unique, overall concept. The superior technology of all components and their precise interaction capitalises in full on the potential of the hybrid concept in BMW ActiveHybrid 7 to an extent never seen before.
- The efficiency of the hybrid system results from the intelligent overall concept applied for generating, storing and using electrical energy. The electric motor integrated in the automatic transmission develops maximum output of 15 kW/20 hp and peak torque of 210 Newton-metres/155 lb-ft. As long as the driver is applying the brakes, the electric motor acts as a generator delivering electric power by means of recuperation for subsequent storage in the lithium-ion battery. With its high capacity, this high-voltage battery located in the luggage compartment provides a direct supply of power to the electric

motor when accelerating and offers an equally consistent flow of power to the a/c compressor while driving and when at a standstill. And last but of course not least, the battery also provides the power required for the conventional 12 V on-board network.

- Generated in a “neutral” process without consuming any energy, the electric power provided by the system serves under all conditions and under all loads to increase efficiency, dynamism and motoring comfort to the benefit of the driver and passengers. Particularly when setting off and accelerating, the electric motor boosts the V8 power unit in providing spontaneous power and muscular driving dynamics. When driving at a steady speed, the additional drive power generated by the electric motor significantly reduces the level of power required of the gasoline engine, cutting back both fuel consumption and emissions in the process. The reduction of engine noise ensured in the process again emphasises the very special driving comfort offered by this unique saloon.
- The possibility to also use the electric motor as a starter ensures that the gasoline engine will start immediately without the slightest vibration – providing ideal conditions for avoiding use of the engine at idle speed when stopping at road junctions or in stop-and-go traffic thanks to the Auto Start Stop function. And when the gasoline engine is switched off, the air conditioner supplied with power by the lithium-ion battery continues to run reliably. Indeed, the driver and passenger also have the option to use the standstill climate control function quite unique in the market before setting out in order to set the interior temperature to the desired level right from the start.
- Energy flow and efficiency displays in the cockpit and the Control Display inform the driver of the operating status and function of the hybrid drive system, providing a clear visual message of the recuperation process. This also shows the driver to what extent energy generated without consuming any additional fuel is used under varying driving conditions.
- BMW ActiveHybrid 7 stands out at very first sight from the outside through its specially developed and aerodynamically optimised 19-inch light-alloy rims in turbine wheel design, ActiveHybrid 7 model designations on the luggage compartment lid and the C-pillars, as well as exterior paintwork in exclusive Bluewater metallic.

- A fully-fledged member of the BMW 7 Series, BMW ActiveHybrid 7 offers sporting elegance and natural presence in design, outstanding driving pleasure and grand touring comfort, as well as a wide range of special features. The car is being launched both with the regular wheelbase of the BMW 7 Series and as an extended version, with wheelbase up by 140 millimetres or 5.5" and with particular focus on rear seat comfort. As an option both models are available with the full range of BMW Individual features as well as BMW ConnectedDrive including innovative driver assistance systems.
- Suspension technology quite unique in the luxury class gives BMW ActiveHybrid 7 truly fascinating driving dynamics and unparalleled motoring comfort. Both models – the regular wheelbase and the extended version – come with a double track control arm front axle, the Integral V rear axle exclusive to BMW, and hydraulic rack-and-pinion steering with Servotronic. Another significant feature likewise offered as standard is Dynamic Damping Control including Dynamic Drive Control. And last but not least, the extended wheelbase model comes with air suspension including self-levelling on the rear axle.
- BMW ActiveHybrid 7 features safety systems such as frontal and side airbags, head airbags at the side, crash-activated headrests at the front, runflat tyres as well as BMW's Tyre Defect Indicator. The lithium-ion battery is housed fully protected in an extra-strong and stable steel compartment. And to provide the final touch, the entire high-voltage system in the car is automatically switched off right away in the event of a defect or collision.

## 2. More Efficiency, More Supremacy, More Luxury: BMW ActiveHybrid 7.



BMW is proud to present the most supreme and luxurious rendition of hybrid technology ever seen so far in the automobile: BMW ActiveHybrid 7.

Based on the BMW 7 Series, this unique car sets new standards for efficiency in the luxury class. BMW ActiveHybrid 7 is the first car in the world to combine a V8 gasoline engine, eight-speed automatic transmission and an electric motor as a mild hybrid concept.

This symbiosis of an upgraded eight-cylinder with BMW TwinPower Turbo Technology and High Precision Injection with a three-phase synchronous electric motor gives BMW ActiveHybrid 7 overall system output of 342 kW/465 hp and maximum torque of 700 Newton-metres/516 lb-ft. Power is transmitted via an eight-speed automatic transmission, with the electric motor positioned in compact configuration between the combustion engine and the converter on the automatic transmission receiving its supply of energy from a lithium-ion battery developed especially for use in the automobile.

Precisely controlled interaction of both power sources serves to optimise not only the efficiency but also the dynamic performance and superior comfort of BMW ActiveHybrid 7. The result is a truly thrilling driving experience and, at the same time, a unique demonstration of hybrid technology with its outstanding potential. BMW ActiveHybrid 7 accelerates to 100 km/h in a mere 4.9 seconds, while keeping average fuel consumption in the EU test cycle to 9.4 litres/100 kilometres (equivalent to 29.1 mpg imp) and restricting CO<sub>2</sub> emissions to just 219 grams per kilometre.

Hybrid technology also provides new options for the particularly efficient use and enjoyment of additional comfort functions. As an example, BMW ActiveHybrid 7 is the first BMW with automatic transmission to feature an Auto Start Stop function avoiding idle speed operation of the engine when at a standstill or in traffic jams. A further significant advantage is that the air conditioning and ventilation system remains fully operational also with the engine switched off, power being supplied directly through the 120-volt on-board network operating on the lithium-ion battery.

This unique concept of engine management for the first allows truly effective climate control also at a standstill in a luxury performance car, cooling the interior of BMW ActiveHybrid 7 to a significantly lower temperature right from the start, before the driver even fires the engine.

Special displays in the instrument cluster and the Control Display inform the occupants of the degree of efficiency and the current operating status of the hybrid components. Nineteen-inch light-alloy rims in aerodynamically optimised ten-spoke turbine wheel design created exclusively for BMW ActiveHybrid 7 as well as model designations on the luggage compartment lid, the C-pillars behind the side windows and on the door cutouts clearly set aside the hybrid models from their "regular" counterparts right from the start. And last but certainly not least, BMW ActiveHybrid 7 is also available in Bluewater metallic exterior paintwork exclusive to this very special model.

Like the existing models within the BMW 7 Series, BMW's first luxury saloon with hybrid drive is entering the market in two body variants. The extended version of BMW ActiveHybrid 7 comes with wheelbase increased by 14 centimetres or 5.5", benefiting exclusively the rear-seat passengers. And to optimise the driving experience and grand touring comfort for individual requirements, both models are available with a wide range of options from the portfolio of equipment and accessories offered on the BMW 7 Series.

**BMW ActiveHybrid as a major element of the BMW EfficientDynamics development strategy.**

Right from the start, the regular production models in the new BMW 7 Series come with a broad scope of BMW EfficientDynamics technologies quite unparalleled worldwide in their diversity and effects. Now BMW ActiveHybrid technology offers yet another option, hybrid technology for the first time achieving the unique standard already defined by BMW in the luxury performance segment.

BMW ActiveHybrid 7 takes a truly innovative approach in ensuring outstanding efficiency in the luxury class. At the same time this unique saloon offers dynamic driving characteristics at a level by far exceeding everything hybrid cars have been able to offer so far.

Appropriate use of the electric motor also in the interest of driving comfort likewise ensures yet another significant step into the future provided by the development of hybrid components focusing on both the requirements of the luxury class and the characteristics so typical of a genuine BMW. The result is an extremely efficient luxury performance saloon at the same time offering unprecedented Sheer Driving Pleasure for a hybrid car.

BMW ActiveHybrid is an important module within the BMW EfficientDynamics development strategy offering technologies able to significantly reduce fuel consumption and emissions on every new model and at the same time enhance driving performance to an unprecedented standard.

Now the innovative drivetrain technology of BMW ActiveHybrid 7 serves to further enhance the efficiency of the car and the driving pleasure it is able to offer, with the gasoline engine and electric motor being perfectly coordinated with one another to provide a significant improvement of dynamic performance and motoring comfort and, at the same time, to capitalise on the use of energy in the fuel under a wide range of different driving conditions.

BMW uses hybrid technology wherever it can make a particularly effective contribution to the reduction of fuel consumption and emissions. As a rule, the savings potential of hybrid technology increases with the power of the combustion engine interacting with the system. Precisely this is why BMW ActiveHybrid technology in conjunction with a V8 power unit achieves a significantly greater effect than when combined, say, with a six- or four-cylinder engine.

In the case of BMW ActiveHybrid 7 precise coordination of the electric motor and the V8 power unit serves to optimise the efficiency of the combustion engine under all kinds of different loads and under many conditions. And through its use in a luxury performance saloon, BMW's sophisticated ActiveHybrid technology offers a particularly convincing rendition of its exclusive character.

**Intelligent energy management optimising the generation, storage and use of electric power.**

The drivetrain technology in BMW ActiveHybrid 7 ensures a particularly intelligent standard of energy management within the car serving to make maximum use of the energy contained in the fuel in generating superior driving dynamics and at the same time to increase motoring comfort to an even higher standard, thus generating Sheer Driving Pleasure from each and every drop of fuel.

The intelligent hybrid concept comprises both the generation and use of electrical energy, with loss-free storage of electric power ensured by the high-performance lithium-ion battery. Both the process of charging the battery and the supply of power to the electric motor as well as all other power-consuming items are ensured and masterminded by power electronics developed specifically for BMW ActiveHybrid 7.

**Electric power generated on no extra fuel as an additional energy reserve.**

BMW ActiveHybrid technology uses energy converted into heat and therefore wasted in conventional cars through the operation and use of the brakes. In terms of power generation, this unique technology is therefore an ongoing development proceeding from the Brake Energy Regeneration used by BMW on all model series in the brand's current gasoline and diesel models with BMW EfficientDynamics.

Referred to also as the recuperation of power, Brake Energy Regeneration concentrates the development of electric power for the on-board network on appropriate running conditions either with the car in overrun or when applying the brakes. Then, when accelerating, energy is fed into the on-board network from the lithium-ion battery, relieving the combustion engine of the task of converting some of the energy contained in the fuel directly into electric current, and thus enabling the engine to provide more power for the actual process of accelerating.

The result is even faster and dynamic acceleration, while the electrical energy obtained in this way is generated without any additional consumption of fuel as soon as the car is rolling or the driver applies the brakes.

As long as the driver requires only a small amount of brake power, the system uses only the electrical brake force, with the mechanical brakes being activated only when the driver presses down the brake pedal harder for more stopping power.

DSC Dynamic Stability Control serves to mastermind the balance of electrical and mechanical braking, naturally maintaining all the driver's freedom in dosing the brakes. A final – and again an important – point is that the driver does not even perceive the transition from braking with electric power to braking with the mechanical brake system.

**Two interconnected on-board networks for flexible management of energy.**

Electric power generated in overrun and when applying the brakes on BMW ActiveHybrid 7 in a neutral process without any additional consumption of fuel is fed into the car's two on-board networks: BMW ActiveHybrid 7 features both a conventional 12-volt on-board network fed by an AGM (absorbent glass mat) battery and a high-voltage battery featuring lithium-ion technology and operating at 120 V. This lithium-ion battery supplies power to the electric motor as soon as it is required to perform an additional drive function or serves to start the combustion engine.



The a/c compressor on BMW ActiveHybrid 7 is also integrated in the 120-volt network, with all other electrically operated functions of the car being supplied with power from the 12-volt network.

The two on-board networks are connected with one another by a voltage converter providing flexible energy management also serving to operate all electrical functions on the car on electric power generated without any additional consumption of fuel. The 12-volt battery is fed with energy from the high-voltage network, which it supports itself whenever necessary, for example when starting the combustion engine cold.

**Cutting-edge energy storage technology: lithium-ion battery with superior capacity and multi-cycle operating strength.**

Introducing the lithium-ion battery, BMW is taking yet a further step into the future with particularly efficient and, at the same time, flexible use of electric power in the car. This means that energy generated in the recuperation process must be fed at all times and, depending on driving conditions, in a varying rhythm to a storage unit where it is kept available for subsequent use whenever required. A further requirement is to use a battery with significant storage capacity for covering long distances without overrun or application of the brakes and without any bottlenecks in the supply process.

The AGM batteries already used in all conventional production cars with Brake Energy Regeneration offer the advantage of being able to handle frequent and irregular charge and discharge cycles without any loss of power. A mild hybrid concept, on the other hand, makes even greater demands, thus requiring a high-voltage battery with a much higher level of performance to also supply the electric motor with the energy capacity required for its drive function.

The system developed for BMW ActiveHybrid 7 is based on the most advanced lithium-ion technology meeting the greatest demands in terms of power loads and lasting operation.

Lithium-ion batteries have already proven their particularly high storage capacity and cycle resistance in many other applications such as mobile phones and laptops. The energy storage unit used in BMW ActiveHybrid 7 confirms the potential of this technology once again, this time under particularly demanding conditions in the automobile. The useful energy provided by this high-performance battery is 400 watt hours, with the battery itself comprising 35 cells as well as an integrated control unit permanently analysing the charge level and ensuring appropriate dependability under all kinds of driving conditions and throughout a wide range of temperatures.

Despite its high level of performance, the lithium-ion battery measures just 37 x 22 x 23 centimetres (14.6 x 8.7 x 9.1 inches) and weighs a mere 27 kg or 59.5 lb. Hence, it is hardly larger than a conventional car battery and is housed conveniently in the luggage compartment between the wheel arches of BMW ActiveHybrid 7, safely surrounded by a high-strength special casing. This ensures perfect protection of the battery and at the same time helps to give the car precise weight distribution.

The space required is about the same as the space taken up by the additional compressor for the rear-seat air conditioning in the conventional BMW 7 Series, with this compressor not being featured in BMW ActiveHybrid 7. The luggage compartment with its capacity of 460 litres/16.1 cu ft therefore offers adequate space for four 46-inch golf bags also in BMW ActiveHybrid 7.

### **Consistent optimisation: V8 power unit with BMW TwinPower Turbo and High Precision Injection.**

The combustion unit featured in BMW's first hybrid luxury saloon is not only particularly powerful, but also the most efficient engine of its kind. Indeed, the combination of BMW TwinPower Turbo Technology and High Precision Injection ensures an exceptionally good balance of performance and fuel consumption, the 4.4-litre V8 applying the principle of BMW EfficientDynamics on a particularly high level.

A further advantage is that the all-aluminium power unit offers the qualities typical of an eight-cylinder in an incomparably sporting and, at the same time, comfortable rendition, combining superior power and pulling force from low engine speeds with an impressive surge of thrust and traction throughout the entire speed range, as well as excellent running smoothness. Given these features, the V8 is indeed the ideal foundation for a hybrid concept in the luxury class serving to ensure outstanding efficiency, fascinating driving dynamics and supreme motoring comfort all in one.

The power and performance characteristics of the V8 power unit result to a large extent from BMW TwinPower Turbo Technology. The engineering principle used for the first on an eight-cylinder gasoline engine with two turbochargers not positioned at the outside, but directly within the V-area to supply compressed air to four cylinders at a time, ensures unparalleled spontaneity in its direct response to the gas pedal. Highly efficient use of fuel, in turn, is ensured by High Precision Injection, this second generation of direct gasoline injection using piezo-injectors positioned directly next to the spark plugs in the cylinder head and delivering fuel in the combustion chambers at a pressure of 200 bar. This is the best guarantee for the extremely precise dosage of fuel and a particularly clean combustion process.

The eight-cylinder power unit featured in BMW ActiveHybrid 7 develops maximum output of 330 kW/449 hp between 5,500 and 6,000 rpm. At the same time this supreme V8 maintains huge torque of 650 Newton-metres/479 lb-ft consistently all the way from 2,000 to 4,500 rpm.

The result is supreme power and muscle starting just above idle speed, the dynamic response of the engine being further enhanced by the electric motor with its additional momentum.

The spontaneous and direct response of BMW ActiveHybrid 7 to the gas pedal particularly when accelerating from a standstill gives the car a standard of acceleration quite unprecedented among both conventional models running on a combustion engine only and existing hybrid models already in the market. Indeed, acceleration to 100 km/h in 4.9 seconds ranks the saloon close to the performance of the fastest and most thoroughbred sports cars.

Another incomparable quality is the subjective feeling of outstanding supremacy the hybrid drive system gives the driver through its direct response free of any delay. Top speed of BMW ActiveHybrid 7, finally, is limited to 250 km/h or 155 mph.

#### **Electric motor starting and supporting the V8 power unit.**

BMW ActiveHybrid 7 owes its characteristic driving features to the harmonious symbiosis of the combustion engine and the electric motor providing a smooth and efficient supply of power at all times. The electric motor supports the V8 power unit in developing even greater power and torque for superior performance. Under less dynamic driving conditions the drive power provided by the electric motor enables the combustion engine to run under more favourable load conditions for maximum efficiency, thus optimising its operating qualities. The additional power reserves serve at the same time to give this unique saloon outstanding supremacy under all conditions, the reduction of engine speed at a steady level of road speed improving not only the standard of efficiency, but also the running smoothness of the combustion engine.

The three-phase synchronous electric motor featured in BMW ActiveHybrid 7 is positioned between the combustion engine and the automatic transmission converter, and is connected firmly to the crankshaft. Shaped like a disc, the electric motor weighs just 23 kg or not quite 51 lb, its compact design ensuring full integration in the transmission housing.

The electric motor generates additional drive power of 15 kW/20 hp, with maximum power increasing to an even more substantial 20 kW/27 hp in the generator mode charging the lithium-ion battery. Peak torque, in turn, is 210 Newton-metres or 155 lb-ft.

In the driving mode BMW ActiveHybrid 7 benefits from maximum output of 342 kW/465 hp and peak torque of 700 Newton-metres/516 lb-ft. So far only much larger engines were able to provide comparable power and performance, in most cases with a corresponding increase in fuel consumption. BMW ActiveHybrid 7, by contrast, combines its significantly enhanced power and performance with an equally impressive increase in efficiency. Average fuel consumption in the EU test cycle of 9.4 litres/100 kilometres (equal to 29.1 mpg imp) and a CO<sub>2</sub> rating of 219 grams per kilometre proves that BMW ActiveHybrid Technology is most certainly a highly innovative and future-oriented rendition of the BMW EfficientDynamics development strategy.

**Unique: eight-speed automatic transmission in combination with Auto Start Stop.**

To transmit the drive power developed jointly by the V8 power unit and the electric motor, BMW ActiveHybrid 7 comes with a newly developed eight-speed automatic transmission specifically tailored to the demands and potentials of hybrid technology. This high-tech transmission of the latest standard combines gearshift comfort, sportiness and efficiency at a level never seen before.

A particular highlight of the new eight-speed automatic transmission is the innovative gearset configuration providing two additional gears and a larger overall gear range than on the six-speed automatic transmission used by BMW so far without any negative repercussions in terms of size, weight, and inner efficiency.

With the number of gears increased to eight, the differences in engine speed from one gear to the next are smaller than before, despite the overall range of gear ratios. This, in turn, benefits the sporting character of the transmission and, as a result, the dynamic performance of BMW ActiveHybrid 7 again so typical of the brand. And last but not least, the smaller differences between gears ensure an even higher standard of gearshift comfort in this new luxury saloon.

The combustion engine, electric motor and eight-speed automatic transmission form one complete unit set out for maximum efficiency in BMW ActiveHybrid 7. This is also confirmed by the innovative rendition of the Auto Start Stop function already featured as standard in BMW's four-cylinder models with manual gearshift. Now this cutting-edge technology serving to reduce both fuel consumption and emissions is combined for the first time with automatic transmission and further optimised in its efficiency.

The Auto Start Stop function automatically switches off the combustion engine when idling, reducing fuel consumption at a red traffic light or, say, in traffic congestions to absolutely zero. Then, once the driver takes his foot off the brake pedal, the combustion engine is re-started automatically.

This configuration of Auto Start Stop helps to switch off the engine more frequently and for a longer period, thus reducing fuel consumption even more effectively. This is made possible by the particularly efficient starter system, activation of the combustion engine by the electric motor supplied with power from the high-voltage battery enabling the engine to start extremely quickly and without any vibrations.

A further technology contributing to this effect is the newly developed hydraulic pulse battery for an even faster build-up of positive engagement in the automatic transmission. The delay-free ignition serves furthermore to reduce emissions while starting.

The engine is also switched off when the driver uses the Auto Hold function in stop-and-go traffic, in which case he again just has to slightly press down the gas pedal in order to re-activate the gasoline engine, which is immediately switched off the next time the driver applies the brakes.

**Unrestricted climate comfort in a stopover, auxiliary cooling for pleasant starting conditions.**

The climate control system in BMW ActiveHybrid 7 is supplied with power directly from the high-voltage battery, thus ensuring all the usual functions regardless of whether the combustion engine is currently running or not.

Hence, operation of the Auto Start Stop function does not mean any restrictions in terms of comfort or motoring pleasure, the driver's and passengers' desired temperature being maintained consistently within the car also in traffic congestion or when making a stopover in city traffic.

Featured as standard in BMW ActiveHybrid 7, four-zone automatic air conditioning comprises a standstill climate control function activated whenever required by remote control. This serves to cool down the interior in, say, bright sunshine before setting out in the car, the highly efficient air conditioning reducing temperature quickly and efficiently by more than 30°C, providing pleasant starting conditions in an appropriately cool and pleasant passenger compartment.

Yet a further advantage is that the a/c compressor initiates its cooling function much earlier than in a conventional car, the air conditioning in BMW ActiveHybrid 7 thus offering qualities unique the world over in terms of function and efficiency only possible with the high-performance lithium-ion battery.

**Efficiency made visible: special display concept.**

The innovative drive components featured in BMW ActiveHybrid 7 have a positive effect under all driving conditions on the efficiency and dynamic performance of this high-tech saloon. Their current level of efficiency and the operating mode are presented by special gauges in the cockpit and on the Control Display.

Featuring the most advanced black panel technology, the instrument cluster in BMW ActiveHybrid 7 is supplemented by an energy flow display in the lower section of the rev counter, a blue arrow showing the current status of recuperation. When accelerating, in turn, an additional graphic display illustrates the boost effect generated by the electric motor.

Using the iDrive control system in the Control Display, the driver is able to activate an even more detailed rendition of the combustion engine and the electric motor in their interaction. Over and above the current charge level of the lithium-ion battery, this display function also shows the current flow of energy – storage of energy when applying the brakes and in overrun, a shift in the load point when driving at a steady speed, discharge of energy while accelerating.

As an alternative to this graphic display, the system is also able at the touch of a button to analyse the current level of efficiency in per cent. In this case a bar diagram updated every minute shows to what extent the efficiency potential of the hybrid components have been exhausted in the last fifteen minutes.

**Superior suspension technology for maximum supremacy on the road.**

BMW ActiveHybrid 7 combines superior efficiency with a truly fascinating driving experience. Over and above the drive system as such, the sophisticated suspension technology featured in the BMW 7 Series gives this new saloon its unparalleled supremacy.

Interaction of a double track control arm front axle with an Integral-V rear axle offers not only numerous benefits in terms of comfort and driving dynamics, but also unusually smooth and harmonious anti-roll and transition behaviour in bends.

The long-wheelbase version of BMW ActiveHybrid 7 comes additionally with air suspension including self-levelling on the rear axle. Both models, in turn, are fitted as standard with BMW's speed-related Servotronic power steering as well as Dynamic Damping Control, the dampers adjusting to both road conditions and the driver's style of motoring.

Pressing the button on the centre console, the driver is able through Dynamic Damping Control to choose his preferred damper setting, the appropriate operation of DSC Dynamic Stability Control, the degree of gearshift dynamics on the automatic transmission, as well as the control maps on the gas pedal and Servotronic steering. In all, Dynamic Damping Control offers the choice of COMFORT, NORMAL, SPORT and SPORT + in setting up the suspension of the car.

The compound brake system on BMW ActiveHybrid 7 ensures truly excellent stopping power in every situation bringing the car safely to a standstill with minimum stopping distance even from high speeds. Inner-vented discs and swing-calliper brakes front and rear optimised for their efficiency guarantee extreme resistance to fading and maximum brake comfort.

BMW ActiveHybrid comes as standard with model-specific 19-inch light-alloy rims in aerodynamically optimised ten-spoke turbine wheel design. Likewise featured as standard, runflat safety tyres measuring 245/45 R19 at the front and 275/40 R19 at the rear enable the driver to continue even after a complete loss of pressure at a speed of up to 80 km/h or 50 mph, covering a distance, depending on the load the vehicle is carrying, of up to 250 kilometres or 155 miles. And last but certainly not least, the Tyre Pressure Indicator consistently measures tyre pressure and warns the driver whenever the pressure in the tyres drops more than 20 per cent.

**Optimum visibility, all-round protection, maximum safety.**

As options supplementing the bi-xenon headlights featured as standard, the High-Beam Assistant and Adaptive Headlights including a bending light function, variable light distribution and adaptive headlight range control, set new standards when motoring at night.

Again available as an option, the Head-Up Display serves to project data relevant to the driver to the windscreen of the car, enabling the driver to check out the data transmitted directly into his line of vision without even taking his eyes off the road.

Apart from frontal and hip/thorax airbags, the Occupant Safety Package featured in BMW ActiveHybrid 7 also comprises curtain head airbags at the side as well as three-point inertia-reel automatic seat belts with belt force limiters on all seats and a belt latch function at the front.

To protect the driver and passengers from cervical spine injury in the event of a rear-end collision, the front seats come with crash-activated headrests and ISOFIX child seat fastenings are featured as standard on the rear seats.

The safety concept for the car's hybrid components is equally comprehensive, all components in the high-voltage system featuring full insulation as well as special plug connectors. The lithium-ion battery, in turn, is protected by a high-strength steel housing and is positioned far away from all kinds of accidents in the luggage compartment, as is already confirmed by a wide range of crash tests. And last but not least, the entire high-voltage system is automatically switched off within fractions of a second both in a function breakdown and in the event of a collision.

**Perfectly networked: BMW ConnectedDrive with innovative functions.**

As an option BMW ActiveHybrid 7 is naturally available with the innovative driver assistance systems provided by BMW ConnectedDrive, including Lane Change Warning, Lane Departure Warning, Speed Limit Info, BMW Night Vision even able to detect individual persons, a back-up camera and BMW Side View. At the same time BMW ConnectedDrive also comprises a wide range of innovative features and technologies networking the occupants with the car itself and the surrounding world in order to provide both maximum comfort as well as optimised use of the infotainment services and enhanced safety.

BMW ActiveHybrid 7 is likewise available with the full range of mobility services including BMW Assist with its telephone enquiry service and Enhanced Emergency Call function allowing automatic detection of the car, BMW Online, BMW TeleServices and unrestricted use of the internet in the car.

The wide range of features and equipment available for the BMW 7 Series enables the customer to personalise his or her car to the highest standard. The highlights include sophisticated navigation functions, audio and rear seat entertainment systems, the extra-large, contoured sliding roof as well as active seats for the driver and front passenger or, respectively, climate and massage seats at the rear.



Particularly the extended wheelbase version of BMW ActiveHybrid 7 offers maximum driving comfort, extension of the car's wheelbase by 14 centimetres or 5.5" ensuring particularly comfortable access to the rear passenger compartment. And thanks to the special design of the roofline and C-pillars, the side view of the longer version, despite greater headroom for the rear-seat passengers, retains the overall impression of the "regular" saloon with its normal wheelbase.

Both models are also available with the wide range of options provided by BMW Individual comprising features such as BMW Individual Merino fine-grain leather standing out not only through its particular material and colour scheme, but also through different seam patterns and stitching on the seats, the instrument panel and the door linings.

Matching the various colours of leather, there is also a wider colour range for the BMW Individual Alcantara roof lining. Exclusive trim options, BMW Individual exterior colours and 20-inch BMW Individual light-alloy wheels, finally, round off the choice of particularly stylish options.

**Best of Hybrid: flexible development for optimised concepts on each model.**

The hybrid components featured in BMW ActiveHybrid 7 were developed jointly by BMW and Daimler in a cooperation project seeking to develop and test components for hybrid drive in luxury performance cars. Apart from the electric motor and the lithium-ion battery, this joint venture also served to develop the power electronics for the high-voltage network featured in BMW ActiveHybrid 7.

Each manufacturer subsequently integrated the hybrid components into the respective model in accordance with individual, brand-specific requirements. These unique characteristics also come out clearly in BMW ActiveHybrid 7 through the combination of an eight-cylinder power unit with electric drive.

BMW ActiveHybrid is based on a modular principle which, following the Best of Hybrid strategy, ensures perfect integration of the optimum component in various vehicle concepts. Hence, the mild hybrid concept of BMW ActiveHybrid 7 is tailored ideally to the specific requirements of this model as is the full hybrid concept for BMW ActiveHybrid X6, likewise reaching production standard in the year 2009.

BMW ActiveHybrid 7 is built at BMW Plant Dingolfing about 70 miles north-east of Munich. Also building all other versions of the BMW 7 Series (and a number of other models), BMW Plant Dingolfing offers a truly unique standard of

excellence confirmed by numerous prizes and awards in the use of innovative production technologies and the fulfilment of supreme quality requirements. Precisely for this purpose, the Plant combines the most advanced, automated production technologies with the craftsmanship of specially trained associates in a most intelligent manner. And having won the Best Factory/Industrial Excellence Award in 2008, BMW Plant Dingolfing also stands out through a supreme level of flexibility, efficient production processes and environmentally-friendly methods in production.

### 3. Specifications.

## BMW ActiveHybrid 7, BMW ActiveHybrid 7L.



		BMW ActiveHybrid 7	BMW ActiveHybrid 7L
<b>Body</b>			
No of doors/seats		4/5	4/5
Length/width/height (unladen)	mm	5,072/1,902/1,485	5,212/1,902/1,484
Wheelbase	mm	3,070	3,210
Track, front/rear	mm	1,621/1,632	1,621/1,632
Ground clearance	mm	151	151
Turning circle	m	12.5	13.0
Tank capacity	app ltr	80	80
Cooling system incl heater	ltr	14.2	14.2
Engine oil(1)	ltr	8.0	8.0
Weight, unladen, to DIN/EU	kg	2,045/2,120	2,070/2,145
Max load to DIN	kg	590	590
Max permissible	kg	2,635	2,660
Max axle load, front/rear	kg	1,310/1,440	1,320/1,450
Max trailer load (12%), braked/unbraked	kg	–	–
Max roofload/max towbar download	kg	100/–	100/–
Luggage capacity	ltr	460	460
Air resistance	C <sub>d</sub> x A	0.31 x 2.41	0.31 x 2.41
<b>Power Unit</b>			
Configuration/No of cyls/valves		V8/4	V8/4
Engine technology		BMW TwinPower Turbo, second-generation direct fuel injection (High Precision Injection)	
Capacity, effective	cc	4,395	4,395
Stroke/bore	mm	88.3/89	88.3/89
Compression ratio	:1	10.0	10.0
Fuel grade		RON 91–98	RON 91–98
System output	kW/hp	342/465	342/465
Combustion engine output	kW/hp	330/449	330/449
Electric motor	kW/hp	15/20	15/20
at	rpm	5,500–6,000	5,500–6,000
Max torque	Nm/lb-ft	700	700
at	rpm	2,000–4,500	2,000–4,500
<b>Electrical System</b>			
Battery/location	Ah/–	90/luggage comp	90/luggage comp
DCDC converter	A/W	150/2,100	150/2,100
<b>Suspension, Driver Assistance Systems, Safety</b>			
Suspension, front		Double track arm axle with separated lower track arm level in aluminium construction; small steering roll radius; anti-dive	
Suspension, rear		Integral-V multi-arm axle in aluminium, steering function, with anti-squat and anti-dive, double acoustic separation (air suspension with self-levelling standard on long-wheelbase version)	
Brakes, front		Single-piston swing-calliper disc brakes	
Diameter		374 x 36/vented	374 x 36/vented
Brakes, rear		Single-piston swing-calliper disc brakes	
Diameter		370 x 24/vented	370 x 24/vented
Driving stability systems		DSC (incl ABS, CBC, DBC, ASC); VDC2 (Electronic Damper Control) as standard	
Safety equipment		Standard: Airbags for driver and front passenger (two-stage), active headrests front and headrests at the rear, three-point inertia-reel seat belts on all seats with belt stop, belt latch tensioner and belt force limiter at the front, crash sensors, head and side airbags for driver and front passenger, head airbags at the rear on the outer seats, Tyre Defect Indicator, Adaptive Headlights with Bending Lights, rain sensor	
BMW ConnectedDrive		Optional: DCC Dynamic Cruise Control, High-Beam Assistant, Night Vision with detection of individual persons, Automatic/Enhanced Emergency Call, access to the internet, BMW Assist/ BMW Online/BMW TeleServices, back-up camera, SideView camera, Rearseat Entertainment	
Steering		Rack-and-pinion power steering with speed-related power assistance (Servotronic) and CO <sub>2</sub> - optimised pump (3.0 turns).	
Steering ratio, overall	:1	19.1	19.1
<b>Transmission</b>			
Type of transmission		Eight-speed automatic transmission	
Gear ratios	I	:1	4.714
	II	:1	3.143
	III	:1	2.106
	IV	:1	1.667
	V	:1	1.285
	VI	:1	1.000
	VII	:1	0.839
	VIII	:1	0.667
	Reverse	:1	3.317
Final drive		:1	2.810
Tyres, front/rear		245/45 R19 98Y RSC/ 275/40 R19 101Y RSC	245/45 R19 98Y RSC/ 275/40 R19 101Y RSC
Rims, front/rear		8.5J x 19 light-alloy/ 8J x 19 light-alloy	8.5J x 19 light-alloy/ 8J x 19 light-alloy

<b>Performance</b>				
Power-to-weight ratio		kg/kW		
Output per litre		kW/hp		
Acceleration	0–100 km/h	sec	4.9	4.9
	Standing-start km	sec	23.5	23.5
In 4 <sup>th</sup> /5 <sup>th</sup> gear	80–120 km/h	sec	–/–	–/–
Top speed		km/h	250	250
<b>BMW EfficientDynamics</b>				
BMW EfficientDynamics, standard features	ActiveHybrid, tyres with reduced roll resistance, intelligent lightweight technology, Auto Start Stop			
<b>Fuel Consump in EU Cycle</b>				
Urban		ltr/100 km	12.6	12.6
Extra-urban		ltr/100 km	7.6	7.6
Combined		ltr/100 km	9.4	9.4
CO <sub>2</sub>		g/km	219	219
<b>Miscellaneous</b>				
Emission rating			EU5	EU5

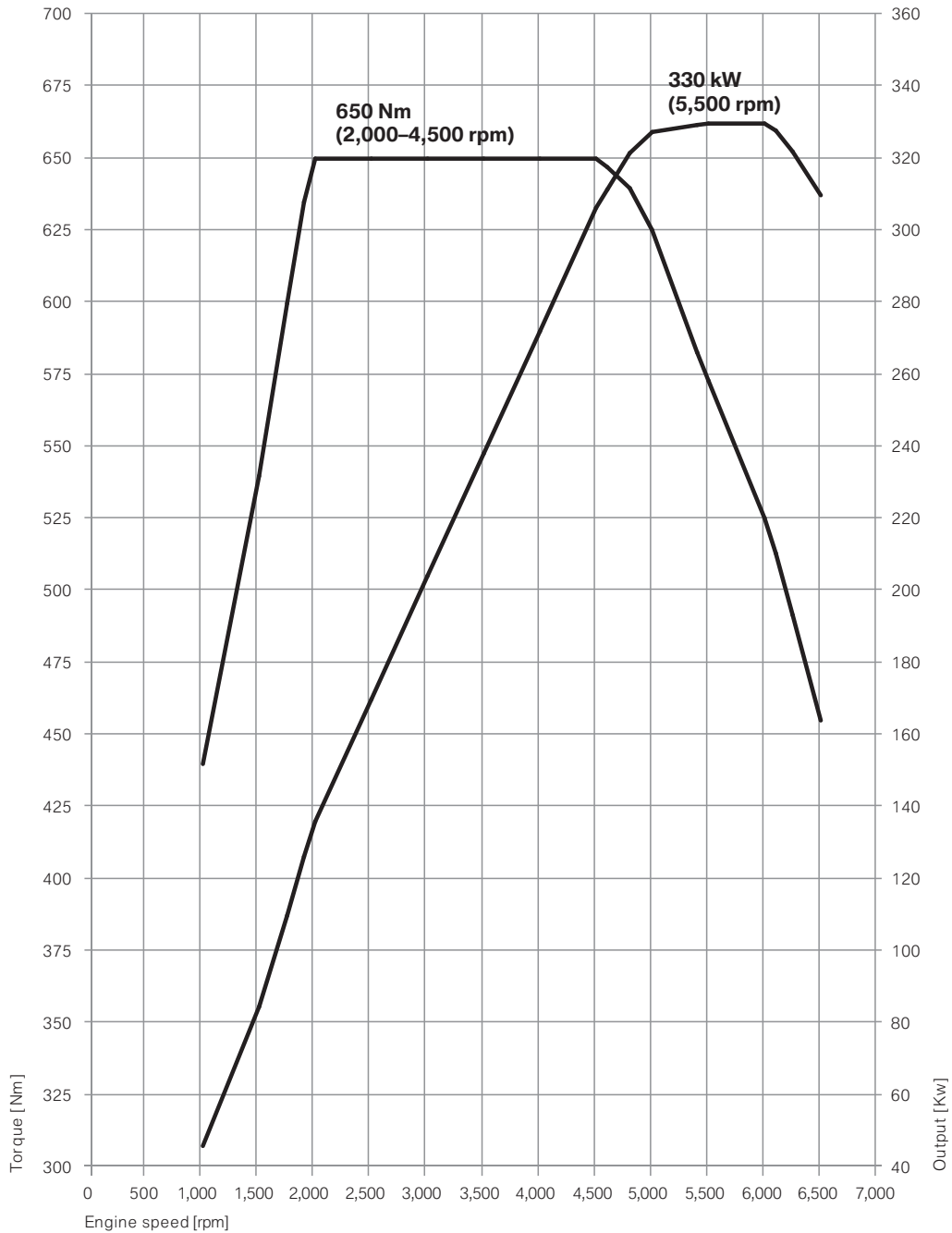
Specifications applicable to ACEA markets/homologation data applicable in part only to Germany (weight).

<sup>1)</sup> Oil change

## 4. Power and Torque Diagrams.



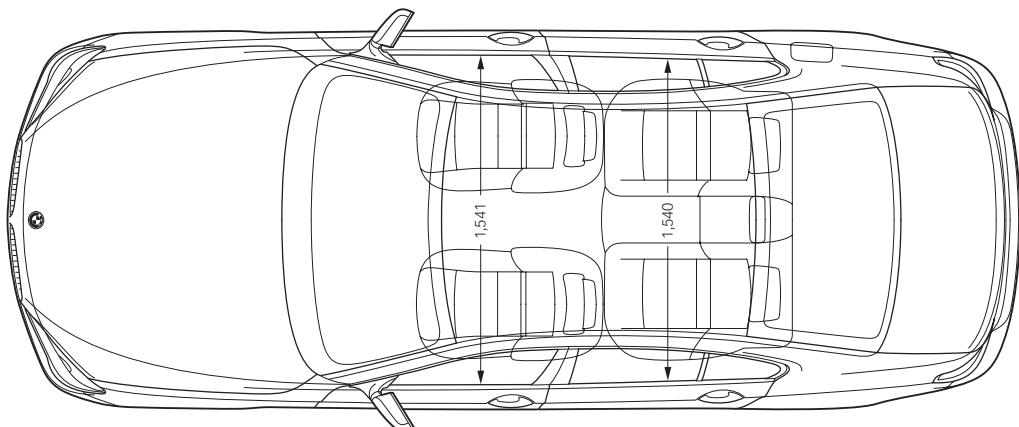
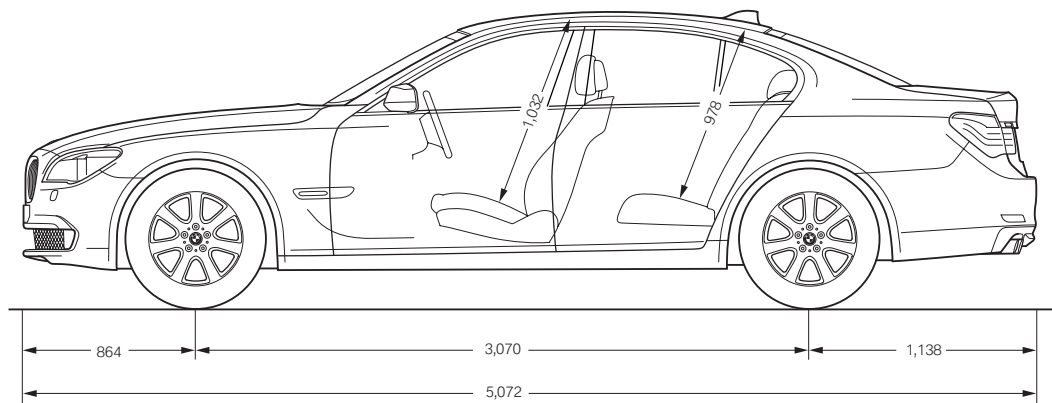
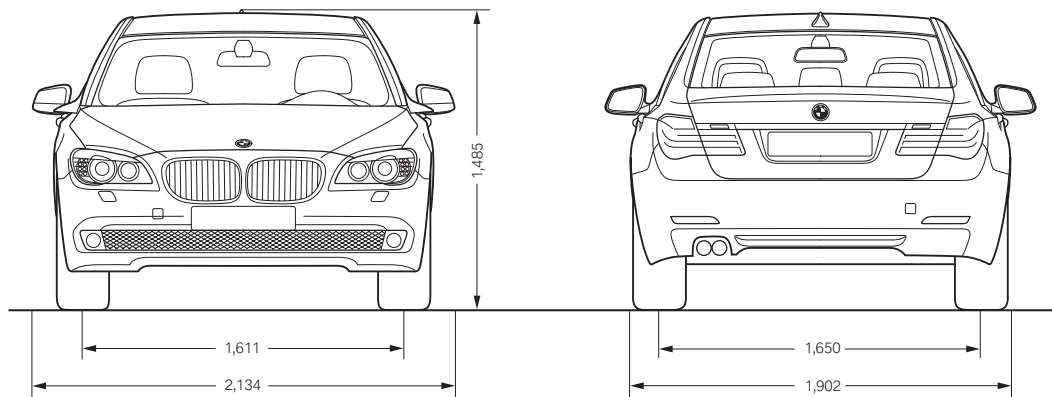
### BMW ActiveHybrid 7.



## 5. Exterior and Interior Dimensions.



### BMW ActiveHybrid 7.



### BMW ActiveHybrid 7L.

