

# BMW Security Vehicles. Contents.



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Details of BMW Security Vehicles refer to the international version. Some models may contain special equipment features which are not part of the standard range of features. Please note that BMW Security Vehicles are not available in all markets and that due to legal requirements, deviations from the model versions described here are possible. Consult your BMW press department for further details.

# 1. Top-class protection for persons at risk: BMW Security Vehicles. (short version)



Few automobile manufacturers in the world have their own security vehicle engineering tradition. For more than 30 years BMW has been one of them, offering a breadth of experience which guarantees reliable and expert vehicle and passenger safety solutions. On this basis, BMW produces security vehicles based on the VR4 ballistic protection level as well as high security vehicles at the VR6/7 ballistic protection level. Their protective features are developed especially for the model in question and integrated in the vehicle in such a way as to achieve an excellent level of safety, as well as preserving a degree of driving dynamics and comfort which is characteristic of BMW.

The result of this integrated concept is a range of security and high security vehicles whose modern technology does justice to the special protective demands of private individuals at risk as well as state representatives, leading business figures and celebrities throughout the world. In order to appropriately fulfil the varying needs of these target groups, security vehicles are developed within different categories. The basis for the high security vehicles of the VR6/7 ballistic protection level is traditionally the long version of the BMW 7 Series. Across several model generations, the BMW 7 Series High Security has become the epitome of a high security limousine for state representatives and private individuals with special protection requirements. This status, which reflects the especially high level of trust placed in the concept of the BMW High Security Vehicles, is further consolidated by the High Security model of the new BMW 7 Series.

At the VR4 protection level, BMW currently offers two vehicles. The BMW 5 Series Security offers superior driving dynamics and a sophisticated safety concept and is available in two engine versions. The second vehicle at the VR4 ballistic protection level is the new BMW X5 Security, which combines the versatility and agility of the successful Sports Activity Vehicle with protective features which have been developed especially for this model. The BMW X5 Security is the only security vehicle in its category to provide protected space for up to five people and their luggage.

## **Ideal combination: Optimum protection, characteristic BMW qualities.**

In all security vehicles offered by BMW, preparations for installation of the protective features are made during product development. All aspects of

active and passive safety are taken into account and effectively combined to create a holistic synthesis. The safety concept F.I.R.S.T. (Fully Integrated Road Safety Technology), which is applied to all BMW vehicles, is the cornerstone of this approach. Based on this, the safety level of the protective measures integrated in the BMW Security Vehicles can be optimized to suit individual customer requirements.

In order to guarantee driving dynamics characteristic of BMW, the chassis and brake system are adapted to the increased weight. All modifications are tested and approved by BMW development engineers.

**Security advantage: Development and production by BMW specialists.**

The high degree of protection offered by the BMW 5 Series Security and the BMW X5 Security results from the integrated safety systems which are installed by hand with painstaking care by highly qualified experts at a special plant in Toluca (Mexico). Unlike retrofitted "armour" features which often leave security gaps and cause excessive strain to vehicle parts, the integration of security fittings during production ensures that all potential weak points are covered. This includes such elements as body joints, door gaps and the transitions between metal and glass.

In the case of the BMW 7 Series High Security, too, the Bavarian automobile manufacturer does not have the protective fittings added by external suppliers but carries out all stages from development to production on its own premises, the BMW Plant in Dingolfing. This ensures that all installations are adapted to the underlying concept of the vehicle and the armour-plating is integrated in the components and cavities by BMW specialists in masterful craftsmanship. Special protective materials are used for the additional reinforcement of the body structure, and the chassis and brakes are also precisely adapted to the additional weight of the vehicle in the BMW 7 Series High Security.

**Model-specific certification guarantees maximum protection.**

All BMW Security and High Security Vehicles are subject to extensive testing from development through to production, including both ballistic tests and test drives. The examination and certification of the entire vehicle is carried out according to international norms by the Beschussamt Mellrichstadt, an official German ballistics authority. While retrofit companies can only subject the material selected for armour-plating to ballistic tests, the form of certification chosen by BMW applies to the entire vehicle. This is the only way to provide evidence of the comprehensive protection of the concept as a whole.

In addition to the stipulated firing angles of 90° and 45°, the tests include other scenarios. In order to ensure that projectiles and shattered glass are kept away from the passenger area even under conditions which do not correspond to the norm, BMW has tests carried out at other firing angles between 17° and 90°.

All over the world, BMW provides its customers with discreet and confidential consultancy by competent experts as well as individual support through the international BMW service network. The worldwide logistics network guarantees swift parts supply. As a special service, BMW also offers specifically designed driver training programs with security vehicles all over the world.

## 2. Meeting all challenges: The new BMW X5 Security.



BMW presents the ideal combination of state-of-the-art security standards with the adaptability of a sporting four-wheel drive vehicle. The new BMW X5 Security guarantees effective and tailor-made protection from criminal attacks and other hazards. Based on the successful Sports Activity Vehicle (SAV) BMW X5, the new BMW X5 Security has room for up to five passengers and provides a superior drive train and chassis technology which allows drivers to master even challenging situations and terrain with confidence. Due to this combination, the new BMW X5 Security is unique in the security vehicle segment. It meets all challenges of day-to-day traffic as well as being able to tackle situations that require special protection and a flexible response.

The new BMW X5 Security has a 261 kW/355 bhp V8 engine. The large, 4.8 litre 8-cylinder power unit mobilizes a maximum torque of 475 Nm at 3,400 rpm. Accelerating from 0 to 100 km/h in only 7.5 seconds, the BMW X5 Security's top speed is limited electronically to 210 km/h. In addition to engine performance, the intelligent BMW xDrive all-wheel drive system ensures dynamic and superior thrust at all times. The constantly, electronically controlled all-wheel drive is networked via DSC Dynamic Stability Control to variably distribute the drive power between front and rear wheels. This way, xDrive promotes dynamic driving and on-road stability as well as off-road traction.

The new BMW X5 Security is the only vehicle of its segment to meet the requirements of the VR4 ballistic protection level. Its security options, which include armoured passenger and baggage compartments as well as safety glazing, have been specially developed for this model and tested as part of the product development process. The integration of protective components was taken into consideration during the development of the BMW X5 model and establishes ideal prerequisites for equipping the BMW X5 Security with highly effective security technology ex works.

### **The BMW security concept: More than thirty years' experience.**

Few international car manufacturers have their own security vehicle engineering tradition. For more than thirty years, BMW has been one of them, offering customers a profound experience that guarantees reliable and expert vehicle and passenger safety solutions. All active and passive safety aspects have been taken into account and effectively combined to create a holistic synthesis.

The safety concept F.I.R.S.T. (Fully Integrated Road Safety Technology), which is applied to all BMW vehicles, is the cornerstone of this approach. Based on this, the safety level of the protective measures of BMW Security Vehicles can be optimized to suit individual customer requirements.

The professional protection concept of the new BMW X5 Security focuses on threats posed by criminal actions such as robbery, kidnapping or carjacking. These crimes are predominantly random acts. Most attackers do not target the passengers, but either their valuable possessions or the vehicle itself. The BMW X5 Security provides extensive protection from such attacks.

### **Official certificate after particularly extensive tests.**

The vehicle's armoured passenger compartment is an essential part of the protection concept. It is bullet-proof and safely withstands attacks using handguns up to calibre .44 Magnum, including calibre .357 Magnum or 9 mm Luger. Accordingly, the BMW X5 Security complies with the requirements of the VR4 ballistic protection level. Testing and certification of the vehicle to internationally recognized European standards DIN EN 1063 and DIN EN 1522/23-1 was carried out by the Beschussamt Mellrichtstadt, an official German ballistics authority. BMW deliberately requested ballistic tests that exceeded conventional requirements. In addition to the stipulated firing angles of 90° and 45°, the tests included real-life scenarios with various long-range firing situations. The vehicle has been certified accordingly.

Superior protection is afforded by special features such as components and panels which are made from special high-performance fibre-reinforced material. This material is used in the side panels, the roof, the front footwell and the rear. Some parts are also reinforced by bullet-proof steel for enhanced protection. Circumferential safety glazing with a 22 mm thickness withstands attacks with impact weapons and is also bullet resistant to VR4 ballistic protection level. The windows are reinforced with an additional polycarbonate layer that offers passengers protection from shattered glass.

The BMW X5 Security also provides complete protection behind the rear seating area. This means that the trunk can be used as a safe storage area. The two-part trunk lid is fully armoured. The maximum vehicle payload exceeds the 500 kilogram mark.

The BMW X5 Security is equipped with an intercom system and an assault alarm, which allows communication with people outside of the vehicle without opening doors or windows. If the assault alarm is triggered, all doors and windows are locked automatically and acoustic as well as visual alarm signals

are activated. The alarm control elements are situated near the cup holders on the centre console, subtly concealed below a flexible cover.

With the help of high-performance camera systems the driver can easily monitor the area in front and behind the vehicle. A rear-view camera transmits an image to the iDrive control display situated in the instrument panel to allow the driver to assess the vehicle's distance to obstacles without the need to look behind. Side View cameras integrated in the bumpers provide a detailed view of the area in front of the vehicle. They also transmit an image to the control display. This system helps detect crossing traffic when exiting multi-storey car parks or narrow driveways.

### **On the safe side: Maximum protection off the production line.**

In contrast to retrofitted security features, all components used for security vehicles that are manufactured by BMW are perfectly adapted to suit the model in which they are installed. The armoured passenger compartment for example provides seamless protection of the entire interior. This way, critical areas such as door joints or transitional sections of the pillars safely withstand bullets or fragments and prevent them from penetrating into the passenger compartment.

The BMW X5 Security chassis is perfectly adapted to handle the extra weight. In order to achieve this, special measures were taken. Among other things, specific chassis components such as suspension and dampers were integrated and the chassis management software was adapted to suit the specific requirements of security vehicles. Moreover, the BMW X5 Security is equipped with tyres which have emergency running properties. Even on complete loss of tyre pressure – as a result of a shooting or after driving over sharp objects, for example – the tyres still function. A fully loaded vehicle can thus continue safely for up to 50 km at speeds of up to 80 km/h.

Another benefit of the ex-works protection concept is the fact that all security measures are integrated without having any impact on the design of the vehicle. Even to the expert's eye, security vehicles manufactured by BMW are virtually indistinguishable from corresponding production models. This meets the customers' need for discretion and provides extra safety for passengers.

### **Driving dynamics and comfort at the level of production models.**

In addition to the outstanding security levels provided by the BMW X5 Security, the vehicle offers a multitude of impressive advantages such as maximum comfort, superior handling and an extremely sporting driving performance. Equipped with the intelligent all-wheel xDrive, the five-seater vehicle is not

dependent on surfaced roads and expertly masters difficult off-road territory just as confidently.

The high-quality drive train technology and chassis management, which includes all elements of the BMW X5 serial production model, provides perfect conditions for safely mastering even extreme driving manoeuvres and confidently evading any hazardous situations whenever required. The all-wheel drive system and DSC Dynamic Stability Control are all networked via the Integrated Chassis Management (ICM), which allows an extremely precise drive power distribution to suit the driving situation at hand. Taking into account the data transmitted by the DSC sensors, the xDrive quickly shifts drive power to the axle with better grip. When dynamically navigating bends, the interaction between xDrive and DSC counteracts the vehicles' tendency to oversteer or understeer in bends. Due to the situation-oriented, variable force distribution between the front and the rear wheels, DSC intervenes by applying the brakes separately on each wheel only if this is required by extreme situations.

The DSC version that was developed for the BMW X5 also includes a so called anti-fading support: any decrease in brake power at extremely high temperatures is set off by increasing brake forces accordingly. Moderate build-up of brake forces, in turn, also enhances brake standby in situations which may require spontaneous deceleration. Regular dry braking optimizes the performance of the brakes in the wet, while the start-off assistant facilitates the process of setting off on an uphill gradient.

The DSC system's range of functions include the special DTC Dynamic Traction Control mode. This mode is activated at the press of a button and raises the thresholds for intervention in both engine and brakes, allowing the vehicle to set off smoothly on loose snow or sand. Last but certainly not least, DTC promotes an even more sporting style of motoring and navigating bends. In order to aid motorists in navigating difficult terrain, the vehicle is equipped with Hill Descent Control (HDC). Networked via DSC, the system allows a controlled descent of hills by means of automatically controlled braking interventions. Even steep off-road sections can be mastered safely and at a constant speed.

### **Standard features of the BMW X5 Security: Adaptive Drive and Active Steering.**

For an even higher level of confidence in mastering challenging driving situations, the new BMW X5 Security provides Adaptive Drive as a standard option. The combination of active anti-roll stabilization and variable damper adjustment allows precise control of body roll and damping exactly as required at all times.

Using sensors, Adaptive Drive permanently monitors and gathers data on the road speed of the vehicle, its steering angle, forward and lateral acceleration, body and wheel acceleration, as well as height levels. Using this information, the system controls both the swivel motors on the anti-roll bars and the electromagnetic damper valves.

The FlexRay high-speed data transmission system is used for the first time for fast and reliable coordination of all Adaptive Drive functions. BMW is the first manufacturer in the world to use FlexRay technology in serial production vehicles.

The new BMW X5 Security is available with Active Steering as another standard option. This system offers exactly the right steering ratio at all speeds and steering angles. Up to a speed of approximately 90 km/h steering behaviour is predominantly direct. Moreover, parking is facilitated by the fact that it takes only two turns to proceed from lock to lock. At higher speeds, Active Steering transmission is more indirect, enhancing the directional stability of the vehicle and, accordingly, its driving comfort.

Active Steering is combined with Servotronic for better steering comfort through reduced steering forces dependent on the driving speed. As part of DSC Dynamic Stability Control, Active Steering is also networked via the ICM and actively stabilizes the vehicle when oversteering in a bend or during particularly demanding braking manoeuvres when applying the brakes on surfaces with a varying frictional coefficient (split-friction braking), for example, Active Steering generates a precise but discreet counter-steering effect to prevent the vehicle from swerving out of control. This way, even challenging driving situations can be mastered with maximum dynamics and utmost confidence.

### **Active and passive safety: BMW X5 is the ideal foundation.**

Not only in terms of drive chain and chassis technology, but also in the areas of active and passive safety, the new BMW X5 Security benefits from substantial progress in development that was achieved with the launch of the new serial production version of the SAV model. The torsional body stiffness, the arrangement of deformation zones, the crash safety of the passenger compartment and the high degree of safety features including their central control, the brake and lighting system have been significantly improved on as compared to the previous model.

The interior of the BMW X5 is equipped with frontal and hip/thorax airbags as well as curtain/head airbags at the side as standard features. These airbags inflate from the A-pillar covers and from the roof lining to protect passengers in

the first and the second row of seats from injury. The BMW X5 is equipped with three-point inertia-reel belts on all seats. These restraint systems come with belt force limiters as well as with a belt latch tensioner for the front seats. ISOFIX child seat fasteners on the rear seats are featured as standard. In the event of an impending rollover, rollover sensors activate the curtain airbags and belt latch tensioners. Networked with DSC Dynamic Stability Control, these sensors guarantee an early and situation-related operation of the system. Due to this extensive package of measures for enhanced passenger safety, the BMW X5 meets the most stringent crash safety requirements. The BMW SAV was the first vehicle in its segment to be awarded five stars, the best result in the Euro-NCAP crash test.

The high-performance brake system in the new BMW X5 is supported by the wide range of DSC functions to ensure excellent stopping power in every situation. Inner-vented discs on all four wheels take up braking energy with maximum efficiency. Brake disc diameter on the BMW X5 Security is 365 millimetres at the front and 345 millimetres at the rear.

In conjunction with the bi-xenon headlights, the BMW X5 Security is also available with the optional Adaptive Headlight. This adapts the illumination of the road to the corresponding steering angle. The headlights follow the progression of the bend, thus improving visibility of the stretch of road in front of the vehicle. In conjunction with Adaptive Headlight, the vehicle can be equipped with the optional turning lights integrated into the fog lamps. At every turn, the fog lamps' light beam is guided to the side by a reflector to clearly illuminate the road ahead in the new direction taken by the turning vehicle.

**BMW X5 Security: Extraordinary SAV, unique security vehicle.**

Safety, dynamics, protection – the new BMW X5 Security provides it all at premium level. It stands for both the extraordinary characteristics of a sporting BMW four-by-four and the manufacturer's outstanding expertise in the development and engineering of security vehicles. The BMW X5 Security imparts a feeling of confidence to the driver and a feeling of safety and comfort to passengers, combined with a discreet appearance which helps maintain passengers' anonymity.

Similar to the production model, the new BMW X5 Security is distinguished by its superior driving dynamics and impressive traction. Moreover, this model provides the comprehensive functional range of the successful BMW SAV model including five seats and adaptable luggage compartment. The only vehicle of its segment to be certified to VR4 ballistic protection level, the BMW X5 Security combines sheer driving pleasure with the versatility of state-of-the-art safety engineering. This vehicle is prepared for mastering or

preventing hazardous situations in more ways than one. The BMW X5 Security is both an extraordinary SAV that is tailored to customers with a special focus on protection and a unique security vehicle suitable for a wide variety of applications and offering a high degree of day-to-day functionality.

**BMW Security Vehicles: Development and engineering to standards of excellence.**

All security vehicles are wholly manufactured by BMW to strict BMW quality assurance specifications in development and production. As with the production vehicle, the BMW X5 Security is manufactured in Spartanburg, South Carolina/USA. The protection components are integrated to BMW process specifications at the manufacturer's plant in Toluca (Mexico).

At the same time, BMW provides its customers with extensive support all over the world, ranging from discreet consultancy to comprehensive service and parts supply. All security vehicles are designed to allow maintenance and repair in regular BMW branches. The service range includes a corporate pool of security and maximum security vehicles.

In addition to its customer service, BMW offers special Security Driver Training programs. BMW has been conducting these training sessions for more than twenty years. Drivers have a choice of different levels of intensity depending on the prior knowledge of the participants. They are carried out in different locations all over the world and are conducted by highly skilled experts. The training program provides an extensive insight both theory and tactical vehicle handling.

### 3. Maximum dynamic performance and effective protection: The BMW 5 Series Security.



With the BMW 5 Series Security, BMW offers an armoured sedan in the premium segment of the upper medium category. Thanks to their unique security concept, the BMW 550i Security and the BMW 530i Security guarantee effective protection from criminal attacks. The two models combine state-of-the-art security technology with the sporty flair, ride comfort and exclusive fittings characteristic of the BMW 5 Series.

The BMW 5 Series provides an ideal basis for a particularly effective security vehicle at the VR4 ballistic protection level. The sedan offers an impressively striking and prestigious design, supreme handling, generous space and uncompromising premium quality. Superior driving dynamics is ensured by the 8-cylinder and 6-cylinder engines available for the security vehicle, the innovative lightweight construction with aluminium/steel body and all-aluminium chassis as well as sophisticated chassis systems such as Active Steering and the roll stabilisation function Dynamic Drive. What is more, fittings such as the operating concept iDrive, BMW Night Vision and Adaptive Headlight including turning light and variable light distribution emphasise the outstanding status of the BMW 5 Series.

#### **8-cylinder and 6-cylinder engines to choose from: supreme power at two output levels.**

The BMW 5 Series Security is offered in two model versions, both of which have identical security features. The BMW 550i Security is powered by a 4.8-litre 8-cylinder engine which offers top-class refinement, supreme power delivery across a wide engine speed range and exemplary efficiency. The V8 engine, with the throttle-free valve control system VALVETRONIC, variable camshaft control Double VANOS for the intake and outlet side and an intake system which operates at two levels, delivers 270 kW/367 bhp and achieves a maximum torque of 490 Nm.

In the BMW 530i Security there is a 3.0 litre inline 6-cylinder engine with a magnesium-aluminium compound crankcase which has an output of 200 kW/272 bhp and a maximum torque of 315 Nm. In the security model, too, it impressively brings out the qualities which are characteristic of BMW 6-cylinder engines – dynamic power delivery, high revving power and exemplary running smoothness. Both model versions boast supreme driving performance figures in everyday traffic and also have extensive power reserves which allow

the driver to escape dangerous situations by means of a swift response. Both the BMW 550i Security and the BMW 530i Security are fitted as standard with a 6-speed automatic transmission.

The BMW 550i Security reaches a speed of 100 km/h from standing in just 6.5 seconds. The corresponding acceleration rate of the BMW 530i Security is 6.5 seconds. Both models have an electronically cut-off top speed of 240 km/h.

### **Extensive protection against criminal attacks.**

With its security vehicles, BMW responds to increasing violence and criminal threats ("carjacking", kidnapping) in numerous regions of the world. This includes Latin America, parts of South-East Asia and the Middle East and some states of the former Soviet Union. The criminal acts in question are frequently random in nature and generally speaking are not directed at the passengers themselves but are committed with the intention of stealing valuables or the vehicle itself. The BMW 5 Series Security is excellently equipped to fend off such attacks since the entire passenger cell is bullet-resistant and its armour fulfils the requirements of ballistic protection level VR4. This means that the BMW 5 Series Security can resist attacks with impact weapons as well as hand weapons and handguns up to a calibre of .44 Magnum including .357 Magnum or 9 mm Luger. The appropriate certification is provided by the German ballistic authority Beschussamt Mellrichstadt based on the norm for bullet-resistant vehicles, BRV 1999. At the request of BMW, the ballistic testing goes far beyond the usual requirements. In addition to the stipulated firing angles of 90° and 45°, the tests include other firing angles in order to make them more realistic, with the relevant certification being provided.

The highly effective protection of the BMW 5 Series Security derives from its integrated protective systems which are installed by hand with painstaking care by highly qualified experts at a special plant in Toluca (Mexico). A precisely defined combination of casings, moulded parts and panels is used to armour the vehicle. These are largely made of materials which are bullet-resistant but nonetheless of low weight. At critical points such as the gaps and borders of the synthetic fibre mats, rust-proof chrome-nickel steel is used. This provides optimum all-round protection for the passenger cell. On request, a shatter protection element can be integrated in the underbody.

In order to ensure seamless protection and still preserve a lower weight, high-quality and extremely carefully finished fibre mats are used for the armour-plating of the BMW 5 Series Security. Aramid mats are thus used for the roof and the body columns and for the front wall to the footwell and the back wall to the luggage compartment. This material is the same as that used for bullet-

proof police vests. Not only is it bullet-resistant, it also resilient to heat, fire and acid. The protective mats in the areas of the doors are made of the even lighter and equally bullet-proof material polyethylene, which absorbs the impact energy of a projectile especially well due to its structure. Chrome-nickel steel is used for bordering the protective mats, sealing the gaps in the door sections and reinforcing window edges.

The security glazing of the BMW 5 Series Security consists of a 22 mm thick compound of plastic and glass. The multi-layered glass is also bullet-resistant according to VR4 ballistic protection levels and is resilient to attack by impact weapons. The window panes also have a polycarbonate coating which provides shatter protection for the vehicle interior.

In contrast to retrofitted armour plating, which frequently leaves security gaps and leads to excessive weight strain on vehicle parts, the integrated protection concept for BMW Security Vehicles covers all potential weak points. This includes body joints, door gaps and the transitions between metal and glass. Due to the model-specific conception of the protective features, which also includes gap sealing, care is taken to ensure that neither projectiles nor shattered glass can penetrate into the interior of the vehicle at critical points.

**Low additional weight, unconstrained comfort, inconspicuous exterior.**

In spite of the extensive security features, the generous interior of the BMW 5 Series Security is preserved virtually without limitation due to the intelligent space concept, with almost the entire range of extensive comfort features still available. The additional weight does not impair the dynamic character of the BMW 5 Series and the security vehicles thus provide the sporty feel which is characteristic of BMW. The additional weight as compared to the corresponding serial production vehicles is just 250 kg. This is significantly less than that of comparable security vehicles produced by competitors in the premium segment.

From the outside, the BMW 5 Series Security is virtually indistinguishable from its serial production counterpart, since many customers attach great importance to discretion and anonymity.

**Active safety and top-level handling.**

The chassis of the BMW 5 Series Security is perfectly adapted to the additional weight. For this purpose, specific chassis components such as springs and dampers are fitted, as well as a particularly high-performance brake system. The electronics box in the engine compartment is protected by means of aramid panels so as to ensure it continues to function even in extreme

situations. The BMW 5 Series Security also has tyres with emergency running properties. This means that the tyres remain operational even in the event of a complete loss of pressure – for example after being fired at or when driven over sharp objects. Even with a full load, these tyres enable the vehicle to be driven for a further distance of some 50 kilometres at a speed of up to 80 km/h.

Perfect handling in demanding driving situations is ensured by the innovative chassis technology of the BMW 5 Series. The driver of a BMW security vehicle also benefits from this in extreme conditions. In the BMW 5 Series Security, as in the serial production models of the BMW 5 Series, the driving dynamics regulation system Dynamic Stability Control (DSC) is fitted, offering a wide range of functions. DSC suppresses both oversteering and understeering in difficult situations on the road. The system also includes a so called anti-fading support: any decrease in brake power at extremely high temperatures is set off by increasing brake forces accordingly. Moderate build-up of brake forces also enhances brake standby in situations which may require spontaneous deceleration. Regular dry braking optimizes performance of the brakes in the wet, while the start-off assistant facilitates the process of setting off on an uphill gradient.

The DSC system also includes the special mode Dynamic Traction Control (DTC). Activated by pressing a button, this mode raises the response thresholds for driving stability regulation and thus makes it easier to set off on snow or loose sand, for example. DTC also enables the driver to take bends in a highly sporty style.

The chassis system Dynamic Drive also reduces roll movements of the BMW 5 Series Security on bends to a minimum. In this way, both agility and comfort is increased at all speed ranges, as well as providing optimum self-steering and load alteration response. The optional feature Active Steering is also available: this varies steering transmission in relation to road speed. At low speeds, Active Steering enables the vehicle to be manoeuvred into a parking space with very little movement of the steering wheel, for example, while at high speeds a more indirect steering response optimises drive stability.

### **Optimum visibility: Xenon headlamps, BMW Night Vision and camera systems.**

The BMW 5 Series Security can be optionally fitted with xenon headlamps and Adaptive Headlight. This ensures that curves in the road are illuminated accordingly. The swivel direction of the headlamps is derived from the position of the steering wheel, the yaw rate and the speed of the vehicle. This feature also includes the turning light function, which adapts the direction of illumination at speeds of less than 40 km/h.

What is more, visibility on straight stretches of road is optimised by the new variable light distribution function. This innovative control system, which like the turning light is part of the special equipment feature Adaptive Headlight, automatically enlarges the field of vision by specifically expanding the light cone in relation to the road speed. In urban light mode at speeds under 50 km/h, identification of objects on the left-hand side of the road is facilitated by means of a wider light distribution, for example. In motorway light mode, the field of vision is expanded by an elongation of the light cone and a more intensive illumination of the area to the left. As soon as the driver activates the fog lamps in addition, the variable light distribution function applies a wider light distribution in the speed range up to 70 km/h, as well as brightening the area close to the vehicle. At higher speeds, both the breadth and range of the light is increased.

An even higher degree of safety for nocturnal driving is provided by the optionally available system BMW Night Vision. The core of this system is a thermal image camera which detects people, animals and objects at the edge of the road at a distance of 300 metres and transmits a contrasting image to the central Control Display which is also used by the navigation system. In this way, the driver's attention is drawn to possible dangers which cannot be identified with the naked eye.

An additional option for the BMW 5 Series Security is a rear view camera. This video system facilitates parking and manoeuvring in spaces where this limited room or poor visibility. The high-resolution images of the rear view camera with wide-angle lens are displayed by the system in colour and with optimised perspective on the Control Display. Interactive track lines also indicate to the driver the optimum steering angle and tightest possible turning circle. Early detection of dangerous situations ahead of the vehicle is facilitated by the innovative system Side View. It operates using two cameras integrated in the front wheel arches which allow early observation of side-on traffic. The images from these cameras are transferred to the Control Display and not only offer an additional convenience when manoeuvring the vehicle but also provide an advance view of what is happening to the left and right of the vehicle when exiting driveways with limited space or poor visibility or when driving out of a multi-storey car park.

### **Security technology off the production line: Intercom system and alarm system.**

The BMW 5 Series Security is fitted with an intercom system and an attack alarm. This means that it is possible to hold conversations with people outside the vehicle without having to open doors and windows. When the attack alarm

is triggered, windows and doors are automatically locked, and both acoustic and visual alarm signals are set off.

The standard range of equipment also includes sun blinds for the rear and side windows which obstruct the view into the passenger area, as well as two side airbags at the rear. At the front, the BMW 5 Series Security is fitted with front, pelvis and thorax airbags as well as curtain airbags at the side.

Virtually all the other comfort options available for the BMW 5 Series are likewise available for the BMW 5 Series Security. In addition, individual wishes can be taken into account which go beyond the special equipment program and the integrated protection features. In this way, the sedan combines the outstandingly high level of security ensured by the integrated protective features with extensive individualisation options.

## 4. **Safety from the very beginning: The philosophy and tradition of BMW Security Vehicles.**



With its security vehicles, BMW has demonstrated its expertise and outstanding technical know-how for 30 years. Currently the fourth generation of such vehicles is available for people at risk, manufactured in parallel to the high-precision serial production process in masterly craftsmanship. The model program ranges from the BMW 5 Series Security to the Sports Activity Vehicle (SAV) BMW X5 Security as security vehicles at the ballistic protection level VR4 and high security vehicles of the ballistic protection level VR6/7 based on the BMW 7 Series. The fifth generation of the luxury sedan also provides the basis for an internationally recognised high security vehicle which meets the requirements of state representatives and private individuals with special protection needs.

The security vehicles BMW 5 Series Security and BMW X5 Security are now offered in the second generation. In the past a BMW 330i Security was also available. The security concept and vehicle technology of all models is always in line with the latest technology, thus offering endangered vehicle occupants maximum protection. An important factor is also that of discretion: from the outside the models are barely distinguishable from serial production vehicles.

### **Remarkable experience and unique diversity in the field of security vehicles.**

As long as ago as 1978, BMW presented its first security vehicle based on a sedan of the BMW 7 Series . Even then the BMW 733i High Security provided an integrated protection concept and thus significant benefits as compared to retrofitted security vehicles. In 1989 and 1995 subsequent generations of the BMW 7 Series were also offered in the High Security version.

In 1997, BMW included a security vehicle based on the BMW 5 Series in its program for the first time. The BMW 330i Security, presented in 2000, was the first medium category security vehicle. Since 2003, the fourth generation of the BMW 7 Series has also been available as a high security vehicle. The world's first security vehicle in the segment of the BMW X models was launched in 2004 with the first generation of the BMW X5 Security.

## **Protection made to measure: Security and high security vehicles by BMW.**

The need for security vehicles has risen steadily in recent years. One reason for this is increasing violence, for example due to “carjacking” and kidnapping in South America, parts of South-East Asia and the Middle East as well as in some states of the former Soviet Union. The security vehicles by BMW are perfectly equipped to resist such attacks and are largely used by private individuals in these regions.

The BMW 7 Series High Security is tailored to the specialised security requirements of state representatives, heads of government and high-ranking business managers. Unlike retrofitted vehicles, the safety features of these models are manufactured in parallel to the serial production process and integrated in the vehicles “from the very first screw”. This means the entire vehicle structure is reinforced from the very beginning and the interior is almost completely preserved. The steel plating of the BMW 7 Series High Security is made of special dual-layer steel. A multi-layer compound glass is used for the windows with a polycarbonate layer for shatter protection. The vehicles meet the requirements of the German Federal Office of Criminal Investigation and fulfil the standards of the highest level of ballistic protection, VR6/VR7. This means that BMW High Security models can even withstand firing by armour-piercing incendiary ammunition. They have also passed tests using a range of explosives.

The BMW 5 Series Security is offered in two versions: the BMW 550i with a 270 kW/367 bhp V8 engine and the BMW 530i as an inline 6-cylinder version with 200 kW/272 bhp. The body is armour-plated using the high-performance fibre compound materials aramid and polyethylene as well as special steel, while the window panes are made of glass which is 22 mm thick and has a polycarbonate layer. Its comprehensive armour plating enables the BMW 5 Series Security to fulfil the requirements for ballistic protection level VR4, providing protection from revolver ammunition up to calibre .44 Magnum. This high level of protection is also met by the all-wheel drive BMW X5 Security. The armour-plated Sports Activity Vehicle by BMW is the only security vehicle based on a model of this vehicle category. Its 8-cylinder engine delivers 261 kW/355 bhp, its intelligent all-wheel drive system xDrive offers outstanding drive stability and traction both on and off the road. The BMW X5 Security provides protection for up to five passengers and their luggage.

## **Official certification based on especially extensive testing.**

The protection provided by all BMW security and high security vehicles is tested by official institutions such as the German ballistics authority Beschussamt Mellrichstadt. The high security vehicles based on the BMW 7 Series even

withstand attacks with explosives or firing of armour-piercing incendiary ammunition of the calibre 7.62x54R API. They are therefore certified at ballistic protection level VR6/7. The BMW 5 Series Security and the BMW X5 Security fulfil the requirements for ballistic protection level VR4. Their armour-plated passenger cell is bullet-resistant and can safely resist attacks with impact weapons as well as handguns up to calibre .44 Magnum including calibre .357 Magnum and 9 mm Luger.

Testing and certification by the German ballistics authorities is based on the internationally recognised guideline BRV 1999 which is in turn based on the norms DIN EN 1063 and DIN EN 1522/23-1. The BRV guidelines for ballistic protection levels VR1 to VR7 define the procedures for standardised testing methods so as to ensure reproducible results. This provides market transparency for customers and drivers of security and high security vehicles when they compare models by different competitors.

Unlike the DIN norms, the BRV norms include the use of an entire vehicle as a test sample. This is the only way to realistically assess the protection concept which has been configured for a specific vehicle model. By contrast, the only option available to retrofit companies is to have armour-plating material tested and certified according to DIN norms. It is not possible demonstrate the protective effect of the vehicle as a whole using standardised firing tests in the case of individually retrofitted vehicles.

The protective concept for BMW security and high security vehicles also incorporates shaft covers and other problematic zones such as body gaps and window edges. This ensures that projectiles and shattered glass cannot penetrate the interior. What is more, the firing tests at angles of 45° and 90° as defined by the BRV guidelines of 1999 are supplemented with tests using other angles to make them more realistic, with the appropriate certification provided for the vehicle.

In addition, the driving properties of security and high security vehicles are thoroughly tested by BMW – including test runs on the Nürburgring. In spite of their increased weight, these vehicles still provide the driving dynamics characteristic of BMW and their driving performance figures are hardly any different from those of their serial production counterparts. This is ensured by such measures as the model-specific adaptation of chassis components such as springs and dampers as well as an especially high-performance brake system.

### **Security straight off the production line: Development and production by BMW specialists.**

The high security sedan is based on the BMW 7 Series and is made at the BMW plant in Dingolfing parallel to serial production operations. Here, all the protective components are integrated in the vehicle. The BMW 5 Series Security is also produced parallel to the serial production model at the BMW Dingolfing plant. First of all, preparatory work for the protective features is carried out during production. Then the vehicles are sent to a special plant in Toluca (Mexico) for final assembly, where the BMW X5 Security also goes to final assembly. The step-by-step integration of the armour-plating material during the production process distinguishes all BMW security and high security vehicles from models which are not armour-plated ex works but retrofitted after production.

Maximum discretion and anonymity is another principle among customers for security and high security vehicles. The models offered by BMW are barely distinguishable from their serial production counterparts from the outside and thus remain largely inconspicuous in road traffic.

### **Discrete and reliable service, special security driver training programs.**

As far as BMW is concerned, it goes without saying that discreet customer support is provided and that individual requests are incorporated in fitting out vehicles with additional protective or comfort features. All security vehicles are conceived in such a way that they can be serviced and repaired at regular BMW dealerships. The service offer also includes the company's own special pool of security and high security vehicles.

In addition, BMW offers special security driver training programs worldwide in which participants practise using BMW Security Vehicles in critical situations. Skills range from brake and swerve manoeuvres to convoy driving, escape manoeuvres, nocturnal driving and off-road handling. There are also courses on tactics, the physics of motoring and ballistics. The programs are delivered by highly qualified instructors, sometimes on race or test tracks or on disused airstrips. Participants are usually drivers at embassies, chauffeurs, security agency staff and personal bodyguards.