4. Control Concept and Driver Assistance Systems: For Absolute Superiority in Every Situation.

Both the development and the design of all controls, switches and driver assistance systems for the new BMW 7 Series were oriented from the start as a clear objective: to ensure absolute supremacy at all times and in every situation. Proven principles, trendsetting concepts and innovative technologies were carefully coordinated from the start in an elaborate development process in order to set new standards for active safety, superior motoring comfort, and sheer driving pleasure in every respect.

In its structure and configuration, the cockpit perfects the driver orientation so typical of a BMW. The consistent arrangement of all functions relevant to the process of driving, on the one hand, and oriented to motoring comfort, on the other, immediately gives the driver a wonderful feeling of being in command in his new BMW 7 Series right from the start – in superior and routined style.

Proceeding from this starting point, it is easy for the driver to use also the new features and functions in part exclusive to BMW, over and above the primary functions of the car. Particularly the many, highly versatile driver assis-tance systems ensure a spontaneous thrill of motoring through the outstanding functionality and benefits. The user-friendly arrangement and configuration
of all displays and control units, including the BMW iDrive control concept now enhanced to an even higher standard, makes the use of these innovative functions in the new BMW 7 Series a genuine enrichment of the driving experience also in the long run.

All this is one of the reasons for the trendsetting progress the new BMW 7 Series offers also through its control concept. Innovations offering the highest potential in terms of safety, comfort and the driving experience, through their thrilling function and intuitive control, make a consistently powerful contribution to maximum supremacy on the road at all times.

Like the former model featuring the trendsetting BMW iDrive control concept for the first time, the new BMW 7 Series again sets the standard in terms of ergonomics, efficiency and functional logic in terms of straightforward and easy control.

Now the new generation of iDrive raises this benchmark to an even higher level. High-resolution graphic presentation on the large Control Display, the newly structured menu guidance and optimised use of the Controller and its direct selection and favourite buttons make the entertainment, information, telephone and navigation functions even more convenient and easy to use. A further important point is that the Controller and the Control Display interacting with iDrive offer ideal conditions for unrestricted use of the internet in the car offered by BMW as the first car maker the world over.

Yet another outstanding innovation is black panel technology on the instrument cluster giving the cockpit an extremely smooth and calm look when not in use and presenting various functions on a black homogeneous panel only when
the ignition is switched on. As a result, classical mechanical elements such as the four circular dials in the tradition style of a sports car are combined most attractively with modern electronic display functions. Through this combination alone, the new BMW 7 Series clearly demonstrates its commitment to proven traditions and the values of the brand while at the same time showing clear orientation towards the future.

Apart from motoring comfort, active safety also reaches a new standard of perfection in the new BMW 7 Series thanks to the car's innovative driver assistance systems. As the first model in its segment, BMW's luxury performance saloon may be equipped with a Head-Up Display projecting information important to the driver on to the windscreen.

Another new feature BMW is proudly presenting for the first time is Lane Change Warning constantly monitoring traffic conditions on the adjacent lanes of the road. Another innovation is the speed limit indicator interacting with the Lane Departure Warning function, using an intelligent combination of camera-controlled traffic sign recognition and information in the navigation software to provide ongoing information on the speed limits allowed on the road the driver is currently taking. And yet another worldwide innovation in the BMW 7 Series is the second generation of BMW Night Vision enhanced to recognise even individual persons and objects ahead of the car.

The control concept: clear structures for even greater driving pleasure and motoring comfort.
The arrangement of all controls, switches and storage boxes and compartments in the new BMW 7 Series follows the principle of elegant and, at the same time, modern function. Apart from the extra-large glove compartment, storage spaces in the door panels and around the centre

console, pockets

on the back of the front-seat backrests and an additional compartment between the driver's door and the steering wheel offer ample space for all odds and
ends the driver and his passengers wish to take along.

Two cupholders are arranged conveniently on the centre console in front of the electronic gear selector lever. The buttons for adjusting the seats, in turn, are arranged in optimum ergonomic position on the outside of the seats, while the buttons serving to activate the optional seta memory function are housed
in the door panels for easy and convenient use before even getting into the car.

The fundamental concept of arranging all controls and instruments is based on the need for a clear, function-oriented structure within the passenger compartment. All driving functions, for example, are on the driver's side, while the comfort functions face towards the middle. This applies both to the position and configuration of the controls in the cockpit and to the multifunction steering wheel where the function buttons for speed control, on the one hand, and the control elements for the audio system and telephone, on the other hand, are separated from one another, again reflecting the arrangement of the displays and instruments in the instrument cluster.

Apart from this horizontal arrangement of the control units for driving and comfort functions, the arrangement of all displays and regular instrument ensure rapid and intuitive orientation in the BMW 7 Series. All primary displays, for example, are located in the upper half of the cockpit, on exactly the same level as the driver's eyes.

The control units, on the other hand, are positioned lower down within perfect ergonomic reach and, thanks to their different surface touch in terms of size, shape and surface qualities, easy to control without even looking.

A further important point is that the arrangement of the switches and control buttons follows the respective context, a group of switches in the direct vicinity of the light switch centre serving to concentrate the functions for activating the various driver assistance systems supporting the driver in the perception of his surroundings.

The power unit of the new BMW 7 Series starts at the touch of the Start/Stop button as soon as the wireless key straight-edged on both sides is inside the car, meaning that the key does not even have to be inserted into the usual opening.

Conventional steering column levers on both sides of the steering wheel serve to operate the direction indicators and the windscreen wipers.

Everything at a glance:
classic circular dials, display in black panel technology.
The instrument cluster on the new BMW 7 Series combines classic elements and new solutions to provide a harmonious unit with features never seen before. One highlight unprecedented in the world of motoring, for example, is black panel technology serving throughout the instrument cluster to ensure perfect harmony of different display technologies incorporating a high-resolution colour display, control and warning lights and four circular dials arranged in the traditional style of a sports car.

The displays serve to provide status and function messages relevant to current driving conditions, navigation data, Check/Control reports, feedback from the control units, and Service Interval information. The circular instruments, in turn, give the driver information on primary driving functions of particular significance. The two large dials present road speed and engine revs, two smaller displays at the right and left outside give the driver information on the level of fuel and engine oil temperature.

As long as the car is at a standstill the displays forms a smooth, homogeneous black surface where only the chrome-coloured surrounds open to the out-
side, the indicator needles and the scale marking on the circular instruments, as well as the red warning field on the rev counter, are permanently presented as primary features. The figures in the circular dials, on the other hand, are presented only when required as an electronic function, just like the integrated displays showing current fuel consumption and the range still remaining.
So like all symbols on the display, they only become visible when activated, that is with the ignition switched on and while driving.

This provides an ideal combination of mechanical and electronic data feedback with all the well-known benefits – and at the same time ensures attractive
visual and technical effects. As long as the car is parked neither the figures nor any other data are visible. But as soon as the driver opens the door, the car quite literally comes to life and the display takes up its service. The chrome rings on the circular instruments open to the bottom before starting the engine are now closed by bright lines, and once the ignition has been activated both the figures as well as the on-board information and telltales come on.

Then, when starting the engine, the individual functions activated personally by the driver are also presented in the interest of greater convenience.

In its innovative design and configuration, the instrument cluster corresponds with the iDrive Control Display and the Head-Up Display available as an option. Depending on the function chosen, the Display may also be used to present telephone numbers or a radio station once activated via the control elements on the multifunction steering wheel.

To choose telephone numbers and radio stations quickly and precisely from a list of numbers and stations provided in advance, the driver may use not only conventional selector buttons, but also a knurled wheel.

Yet a further option is to present navigation functions and the status of Dynamic Driving Control in the Display – and if the car is equipped with a navigation system, the instrument cluster will also support the High Guiding function, clear and realistic arrow symbols giving the driver information for changing his lane or helping him when turning at an unclear road junction.

Using the Head-Up Display, finally, the driver receives all relevant information primarily right in front of his eyes on the windscreen, with the relevant data not re-appearing in the instrument cluster until the Head-Up Display has been switched off.

Automatic air conditioning controlled in full via buttons on the centre console.
A second display in black panel technology in the centre console presents the current settings on the automatic air conditioning featured as standard, thus showing the interior temperature and the ventilation mode with particular precision and, at the same time, in particular style.

All settings on the automatic air conditioning may be activated in the new BMW 7 Series by a group of buttons on the centre console, enabling the driver and front passenger to set the temperature, air volume and distribution via a control unit on the air conditioning panel individually for the right- and left-hand side of the car for their personal preferences.

The particular characteristics of such fully automatic control can be adjusted directly on the climate control panel in five levels of intensity according to the driver’s and passengers’ individual wishes. And by simply pressing a button, the desired setting activated for the driver may be transferred to all the seats in the car.

Optionally available four-zone automatic air conditioning serves additionally to regulate temperature, air volume and distribution on the left- and right-hand side at the rear and comprises a separate control unit on the rear

centre console. The long-wheelbase version of the BMW 7 Series, in turn, is available not only with four-zone automatic air conditioning, but also with separately controlled roof vents supplied with cool air from an additional climate control unit fitted in the luggage compartment.

Electronic gear selector level and Driving Dynamic Control button on the centre console.
The arrangement of control units on the centre console simply begs the driver to pursue an active style of motoring, at the same time allowing convenient
and intuitive use of all comfort functions.

The new BMW 7 Series comes with an electronic gear selector lever on the centre console directly next to the control unit for Dynamic Driving Control facing the driver and, on the other side, the iDrive Controller.

Dynamic Drive Control allows the driver at the touch of a button to vary the car's set-up in the various COMFORT, NORMAL, SPORT and SPORT + stages, while another button directly ion front serves to choose the various settings on DSC Dynamic Stability Control.

Instead of a conventional handbrake, the new BMW 7 Series features an electrohydraulic parking brake operated at the touch of a button without requiring the slightest effort on the part of the driver. The Auto-Hold function likewise operated by a simple button automatically holds the car at a stand-still, ensuring extra comfort in stop-and-go situations.

Consistently enhanced for intuitive use: BMW iDrive.
The new BMW 7 Series naturally features BMW's trendsetting iDrive control system serving to activate and control all entertainment, information, navigation and telecommunication functions featured either as standard or as an option. Introduced for the first time in the former model, BMW iDrive has revolutio-nised the modern philosophy of ergonomics, function and control logic in the automobile, playing a leading role particularly in the premium segment.

Now the new generation of BMW iDrive gives BMW an even greater lead over other manufacturers with comparable systems in terms of presentation quality and intuitive control.

On the new BMW iDrive the control and display functions again remain consistently separated from one another, the former being set by the

Controller on the centre console, the latter presented in the Control Display in the middle.

This places the control element in a perfect ergonomic position and enables the driver to take up the information presented most conveniently, hardly taking his eyes off the road and traffic conditions around him.

Measuring 10.2 inches, the extremely large display sets a new standard in the market through its ultra-clear presentation and easy-to-understand, optically attractive graphics. Positioned on the same level as the instrument cluster,
the display is within clear sight both for the driver and front passenger at exactly the right distance from their eyes.

Likewise in exactly the right ergonomic position, the newly developed Controller allows convenient and intuitive selection and activation of functions by means of standardised tipping, turning and pushing motions. Again, this ensures smooth and convenient operation with virtually no distraction from traffic conditions, enabling the drive to concentrate in full on the actual process of driving his car.

Inviting function and long-term use:
Controller with direct selection buttons.
The new iDrive Controller is now even easier and better to control than before. In its design and configuration its follows the most advanced biomechanical findings clearly reflected through the surface touch of the Controller itself and its clearly structured mechanical features. Apart from the clear control principles, the new design of the Controller panel makes the entire process
of controlling and operating the system even more ergonomical.

The benefits of the control elements, the menu structure and the graphic presentation in the Control Display are obvious right from the start and become even greater in the course of time with the driver consistently using the system. An image of the Controller presented in the Control Display ensures even easier and more convenient orientation in choosing the next operating function.

The various operating steps activated by tipping, turning or pressing the Controller are largely similar to the control functions we are all accustomed to when clicking the mouse or turning a wheel on a computer. Turning the Controller, for example, the driver automatically browses through a list of menu items, subsequently confirming the function of his choice simply by pressing the Controller when appropriate. Tipping the Controller to the left or right,

in turn, enables the driver to conveniently navigate through the various levels of the menu.

Through clear graphic presentation of functions on superimposed levels and the presentation of Controller positions currently possible, the driver receives optimum clarity and orientation at all times. The control options on the Controller and graphic presentation in the Display therefore come together in perfect harmony as an ideal match. All menus follow the same uniform scheme, again enabling the driver to make himself acquainted with operating conditions quickly and without the slightest trouble. The menu trees are extra-wide to allow a maximum number of options without having to change to another menu level. At the same time the functions are perfectly arranged for rapid access to the most important options in regular use of the Controller and its programs.

As in the past, the Controller allows the driver to operate and control all functions in the system. And now, as a further innovation, the Controller comprises four direct selection buttons for the menu options used most frequently. Pressing these buttons, the user is able to switch over spontaneously to the CD, Radio, Telephone and Navigation functions without the slightest delay.
A particular advantage is that these buttons are all within easy reach of the user’s fingertips, while the driver keeps his hand resting comfortably on the Controller.

The range of direct selector buttons is supplemented and rounded off by the three command buttons MENU, BACK and OPTION serving to call up the start menu, to return to the menu activated last, and to present additional options in the current context. This either shortens the usual search processes or makes them completely superfluous. In addition, the BACK button supports the driver in getting used to the system in an almost playful manner, without
the slightest hassle: Pressing the BACK button, the driver quite simply reverses the operating function activated before, as is the case with the reverse button on an internet browser.

Proven assets now even more convenient for the user:
the favourite buttons.
Through its versatility, BMW iDrive also offers the driver personal convenience and individual choice as yet a further enhancement of motoring comfort and individual style. Precisely this is also the purpose of the favourite buttons in the centre console already proven in other BMW models. Apart from radios stations, telephone numbers and navigation destinations, these eight buttons now serve for the first time to save and directly retrieve menu items via
BMW iDrive.

At the touch of a button, therefore, the driver is able not only to directly access his favourite station or home address, but also to present the navigation map
he prefers in his favourite scale, to check out traffic reports, to control the balance of the loudspeakers in the audio system, or to choose a specific chapter in the Owner's Manual integrated in the car.

The approach sensors on the touch-sensitive favourite buttons briefly present the function saved by the driver or user on the Control Display as soon as they touch the respective favourite button, thus serving to avoid faulty operation. And last but not least, the individual favourite button functions may be saved specifically for various users on the keys to the car.

Extra-large displays with variable layout, preview maps and full-screen presentation.

BMW iDrive in the new 7 Series features an extra-large 10.2-inch Control Display exceeding all other graphic surfaces and presentation displays ever seen before in an automobile not only in its size. Resolution of 1,280 x 480 pixels likewise offers far better options to present the most detailed graphics.

The high-class and sophisticated flair provided in this way is the result of an elaborate combination of the most advanced hardware and software technolo-gies, menu lists presented in bright letters on a black background, very
clear symbols and modern graphics with clear colour codes contributing to the superior images and presentation ensured in this way.

The structure of the control menus likewise facilitates the process of finding the functions required, the flat menu trees and systematic use of the iDrive control functions carried over from well-known computer technology providing rapid access to the options desired. All function areas controllable by iDrive
are listed from the beginning in the starter menu, the driver selecting the item required through a new menu board or level in each case.

The choice of menus and items available is again presented in clear lists, such consistency in guiding the user facilitating the process of orientation and the arrangement of menu boards on several levels within the display. Visual operating aids serve to provide additional clarity. And if really necessary, all the driver has to do is press the BACK button on the Controller to reverse
a false decision.

Use of the optional navigation system is also even easier than before thanks to the optimised technical features now offered by BMW iDrive. Full-screen presentation of maps, for example, ensures an unprecedented overview of the region the driver is currently travelling through with all details of interest. Both maps and individual symbols can be presented as three-dimensional graphics – and now, supplementing the perspective style of presentation already offered in the past, the driver can also use an elevation map. Even specific sights along the route are presented in graphic form as realistic photos.

The impressive technical qualities of the system come out clearly from the start when entering the destination. Choosing his destination from a list of places or locations, the driver also receives a map preview leading to each possible proposal during the initial selection process, thus easily distinguishing between various places of the same name simply through the geographical information provided.

The process of spelling the names of places and streets as well as the entry of telephone numbers is facilitated by a circular Speller, the circular arrangement of letters and numbers speeding up the entry process significantly.

A new standard of navigation in the automobile.
The fundamentally optimised navigation system with its outstanding display resolution, the most advanced style of 3D map presentation and numerous other useful innovations is one of the highlights of the new BMW 7 Series. The system offers not only a new standard of imagery and graphic presentation,
but also highly efficient control for maximum convenience.

Graphic presentation on the Controller, for example, significantly facilitates the choice of functions and settings, the route criteria being selected on the left, with a preview screen on the right serving to provide even faster orientation. Apart from towns and streets, this preview screen also offers relevant traffic information for the route chosen.

A unique feature is the full-screen view on the extra-large Control Display offering the user a complete overview even of fine details at a glance. On request an assistance window provides further views independently of the main map, with the contents in the assistance window being determined by the customer in advance from a preselected list. As an example, the user is able

to opt for the on-board computer display or details on the entertainment programme.

The menu item “Highlight Traffic Conditions” offers up-to-date convenience not only in city traffic, since this item also presents current traffic congestion reports visually in the form of road sections marked in red. So the driver using

this system also receives important information and complete orientation on the motorway showing him the possible need to change his route on account of traffic congestion.

The new High Guiding function with integrated lane recommendation enhances the operating efficiency of the new navigation system in the new BMW 7 Series to an even higher standard. High Guiding presents specific, detailed views such as the turning/no-turning options at an unclear road junction from the screen directly to the instrument cluster or, when fitted as an option, to the Head-Up Display.

Presentations of maps in 3D and with a high level of display resolution make the use and operation of the new navigation system in the BMW 7 Series a truly unique experience. Realistic presentation on elevation maps when driving through mountain scenery, for example, offers clear recommendations as to the best and most scenic route.

On smaller map scales down to 25 metres, integrated three-dimensional presentation of surrounding buildings provides very helpful additional orientation particularly in large cities, while on country roads the presentation of major buildings or rural sites and areas helps to provide further clarity. And last but
not least, the 3D presentation of sites – so-called Points of Interest – in the new navigation system shows the user more clearly whether he is about to reach
a planned stopover point.

The Travel Planner with its Guided Tours function ensures optimum travel comfort at all times, compiling various destinations on the way to provide one personal, individualised traffic route and giving the driver the option to call up these destinations automatically one after the other. Supported by the virtual Travel Planner, the navigation system is even able, as a special function, to select the most attractive routes the driver and his passengers wish to enjoy. And should the driver decide to choose another favourite route, he
obviously has the option to enter destinations on the way as he chooses.

The individualist wishing to plan his route ahead at home or on his PC, is able to do so via the BMW ConnectedDrive Internet Service this time with the help of the Route Planner, putting together personal routes with any desired number of stops on the way and downloading these routes via a USB stick or by mobile communication into the car’s navigation system.

Convenient combination of voice control and the BMW Controller.
Yet a further innovation now offered by BMW iDrive is multi-modal operation by voice entry and the Controller. Now, therefore, the customer is able to switch
at ease from one function to the other while making an entry, if he wishes even leaving voice recognition active while making an entry by way of the Controller and using voice entry at the same time.

All the user has to do is press the appropriate button on the multifunction steering wheel to activate voice control and then press the button again to terminate the function when finished. To simplify voice entry, the commands available are presented in the Display.

In addition to these amenities, iDrive also responds to numerous synonyms used when entered, the option to enter names of towns and streets in full words speeding up the process of voice control in choosing your destination and operating the navigation system.

Numerous studies with a representative selection of test persons from various regions the world over were conducted in developing BMW's new concept of iDrive. The criteria examined in these studies were, first, the user's immediate response to the system and, second, the experience gained in long-term tests. Knowledge gained from the customer's use of other electronic appliances
was also evaluated in the process.

As a result of these painstaking and precise studies, the new iDrive control concept boasts some functions quite comparable to the use of a PC when surfing in the internet. Consequently, optionally available unrestricted use of the internet is masterminded via the Controller and the Control Display in the iDrive system.

BMW's optimised iDrive once again confirms the significant progress made in automotive control systems, combining greater efficiency, enhanced control logic, and appealing, clear display graphics. The new iDrive thus makes travelling in the new BMW 7 Series a truly incomparable experience, under-lining the outstanding position of this exceptional premium car in the automobile market.

Unparalleled precision:
BMW Night Vision with detection of individual persons.
BMW is the first car maker in the world to introduce Night Vision able to detect even individual persons on or near the road and give the driver an

appropriate warning in the new BMW Series. This new generation of BMW Night Vision therefore sets new standards in avoiding accidents at night.

The central unit within the system is a thermal imagining camera providing a moving video image which enables the driver to recognise people, animals and other objects also outside of the headlight beam in high-resolution presentation in the central Control Display. For the first time, therefore, the system is supplemented by the detection of individual persons.

This is made possible by a control unit analysing video data and using intelligent algorithms to search specifically for pedestrians then highlighted by a yellow colour in the video image. And should the system determine that a person ahead of the vehicle is at risk, the driver will receive an additional warning in the interest of extra safety.

To minimise the number of warnings and to focus on pedestrians really endangered, the Night Vision control unit conducts a complex analysis of each situation, restricting its warnings to pedestrians in a warning corridor determined as a function of speed, the steering angle, and the yaw rate of the car. Should the system, for example, recognise a person at the side of the road, moving towards the road or already standing on the road surface, the driver is warned in good time by means of a symbol in the Control Display. And if the car is equipped with a Head-Up Display, the same information is also presented on the windscreen right in front of the driver’s eyes.

A number of other driver assistance systems likewise serves to enhance both motoring comfort and active safety in the new BMW 7 Series. These systems offer the driver helpful support in inconvenient situations such as traffic congestion or unclear routing, help him assess current traffic conditions, and promote his awareness in demanding driving manoeuvres. As a result, therefore, he is able to concentrate even more on Sheer Driving Pleasure in the new BMW 7 Series, without in any way being deprived of his responsibility
at the wheel.

Always precisely on course: Lane Change Warning.
Lane Change Warning available for the first time in a BMW helps the driver overtake in superior style and with superior safety. Radar sensors at the rear of the car monitor traffic conditions on adjacent lanes, covering a range extending from the so-called dead angle on the next lane all the way to a distance of
60 metres or almost 200 feet behind the car.

A triangular symbol lighting up permanently at the bottom of the exterior mirror housing shows the driver whether there is a vehicle in this critical range.
Then, should the driver activate the direction indicator all the same, showing that he is about to change lanes, he will receive a further warning by way

of an LED signal. And if even this is not enough, he will be warned by discreet but clearly perceptible vibration on the steering wheel in the same sequence
as the Lane Change Warning signal.

This high-tech system available as an option on the new BMW 7 Series also determines any unwanted changes in lane.

The Lane Change Warning system is made up of a camera fitted on the inner mirror on the windscreen, a control unit for the comparison of data, and a signal actuator generating the vibration effect on the steering wheel.

World debut in the new BMW 7 Series: recognition of traffic signs.
In combination with a navigation system and Lane Change Warning, the new BMW 7 Series offers yet another exclusive function: the Speed Limit Indicator gives the driver reliable information at all times on the current speed limit allowed on the route he is taking.

This function enhances motoring comfort particularly on long distances, informing the driver at all times of current speed limits without requiring him to check out the signs by the road. Instead, a camera fitted next to the interior rear-view mirror permanently monitors speed signs at the side of the road as well as variable speed limits displayed on overhead signs on the motorway.

The data thus obtained from such signs is compared immediately with the relevant data saved in the navigation system, any deviation in speed limits due to a short-term change in conditions – for example in the event of building construction – thus being given priority over the data registered in advance.

The system even considers further traffic restrictions imposed by signs along the road, again presenting the current speed limit in both the instrument cluster and, where fitted, in the Head-Up Display. The result, clearly, is that the driver’s risk of breaking the speed limit is reduced most significantly.

Everything in sight right from the start thanks to Side View.
BMW ’s innovative Side View system is now available as yet another option. Side View uses two cameras integrated in the front wheel arches to observe and detect traffic approaching from the side in good time. The pictures recorded in this way are presented on the Control Display, offering additional comfort not only when manoeuvring, but also when driving out of narrow

gateways with poor vision or when leaving a car park again with obstructed visibility, since the driver is quickly able to see what is happening to his left and right.

In the interest of rapid availability whenever required, Side View is activated by
a direct selector button in the centre console.