**The technologies of the all-new Tiguan**

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A red car parked on a road

Description automatically generated

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**Notes**

1. Near-production concept vehicle. The vehicle is not yet available for sale.
2. Line-specific or optional equipment
3. “Mobility in Germany” study.

At a glance

**The MQB evo delivers the building blocks of progress**

* Latest evolutionary stage: The MQB evo stands for innovative technologies, flexible drive concepts and synergies across product lines
* New adaptive chassis control: with the MQB evo, Volkswagen brings progressive high-tech features such as DCC Pro on board the Tiguan.
* Electric for everyday driving: two new plug-in hybrids with an electric range of around 100 km and DC fast charging (50 kW) build a bridge into the world of electric mobility
* Efficient 48-volt technology: new mild hybrid drives convert kinetic energy into electric energy and make it possible to temporarily switch off the engine
* Intuitive operation: new digital instruments and a new infotainment system merge to create a next-generation cockpit landscape

**Matrix of advanced MQB technologies.** The MQB evo is a matrix made up of ultra-modern technology modules that are perfectly integrated with each other. Volkswagen has developed the new Tiguan and Passat Variant, as well as an update for the Golf, based on these modules. The elevated quality of its interiors, a new and intuitively operated infotainment architecture, a new generation of plug-in hybrid drives with long electric ranges of approximately 100 km and new DC fast-charging function, as well as highly comfortable running gear, combine to make sure the expectations of Volkswagen drivers are met: progressive vehicles that are in step with the times and provide that note of perfection in every area. The latest MQB models therefore have the potential to continue the success story of their predecessors well into the future.

**MQB evo makes high tech more affordable.** Customers who choose the new Tiguan (third generation), Passat Variant (ninth generation) or the new Golf (eighth generation update) will benefit from the significant economies of scale offered by the modular transverse matrix. That is because a host of new systems are used on board these Volkswagen models and their development costs are shared across all MQB product lines. In this way, Volkswagen makes innovations available and more affordable for hundreds of thousands of car drivers worldwide.

**TDI, TSI, eTSI and eHybrid.** A general special feature of the MQB is the fact that all common drive types can be realised in one product line: diesel engines, petrol engines, mild and plug-in hybrid systems and even all-electric versions, as proven by the e-Golf (seventh generation). All MQB models have front-wheel drive or, depending on version and power output, all-wheel drive. The new Passat Variant and new Tiguan as well as the update of the current Golf will be available with turbodiesel engines (TDI), turbocharged petrol engines (TSI), mild hybrid turbocharged petrol engines (eTSI) and plug-in hybrid systems (eHybrid).

**New MQB and MEB infotainment system.** During the development process, Volkswagen did not just make use of the potential offered by the MQB, but also exploited the overall synergies of the brand and Group. This reduces costs and allows access to the technologies of other product lines. The MQB evo is therefore intentionally equipped with interfaces to the other matrix platforms of the brand and Group in order to benefit from economies of scale. This compatibility is made clear, for example, by the new fourth-generation modular infotainment matrix: the MIB4 graphic design, menu structure and operating philosophy are the same – with corresponding synergies – as in the new ID.4, ID.5 and ID.7 (MEB models). Another advantage: when changing from an MEB to an MQB model and vice-versa, drivers no longer need to get used to different display and operating concepts.

**MQB – from the small Polo to the large Atlas.** The MQB shapes the brand and the Group like no other platform. The first two MQB models were the Volkswagen Golf (seventh generation) and the Audi A3 (third generation) in 2012. They were followed at the end of 2014 by the first Passat (eighth generation) on this platform, the Touran (second generation) in mid-2015, and then the Tiguan (second generation) at the start of 2016. All Volkswagen MQB models share common engine and gearbox series with a standard installation position, an identical running gear architecture, and common components such as the all-wheel drive system, air conditioning systems, steering wheels, infotainment system and assist systems. There are also synergies in production, because different MQB product lines can be produced in parallel in one factory. At the same time, the modular platform also offers a great deal of freedom – the wheelbases, tracks or power range of the drive systems can be varied, for example. This makes it possible to develop such different Volkswagen models as the compact Polo and the large US SUV Atlas on the basis of the MQB.

Key aspects

**ELECTRIC DRIVING – eHYBRID WITH LARGE BATTERY**

**eHybrid with 150 kW**1 **and 200 kW**1**.** Volkswagen has extensively redesigned the eHybrid and created a new drive system that connects the world of petrol engines and electric drive motors better than ever before. The goal was to merge long overall range and usable e-mobility for the majority of all journeys. To this end, Volkswagen has equipped the eHybrid with a new and larger battery, a higher charging capacity and, for the first time in a plug-in hybrid model, the 1.5 TSI evo2 engine. In the basic version, this high-tech turbocharged petrol engine for the eHybrid drive delivers   
110 kW (150 PS)1 and, together with the electric drive motor’s peak output of   
85 kW (115 PS), enables a system power of 150 kW (204 PS)1. Optionally, the flagship version of the engine is available with 130 kW (177 PS)1, which together with the electric drive motor generates a system power of 200 kW (272 PS)1. The 150 kW version1 will develop a system torque of 350 Nm, while the 200 kW version1 offers   
400 Nm of torque. The highest system power and the maximum system torque are not additions of the values of the 1.5 TSI evo2 and the electric drive motor, but are maximum values controlled electronically for maximum efficiency.

**1.5 TSI evo2 with 110 kW**1 **and 130 kW**1**.** The plug-in hybrid drive consists of two drive modules: the electric drive motor and the turbocharged petrol engine. A 1.4 TSI petrol engine was used in the hybrid predecessors. This engine was replaced by the 1.5 TSI evo2 and is thus also used for the plug-in hybrids for the first time. The 1.5 TSI evo2 of the EA211 engine family is the second generation of this 1.5-litre four-cylinder engine. The evo2 is characterised by a number of high-tech features. These include the TSI-evo combustion process and a variable turbine geometry (VTG) turbocharger. The combination of the TSI Miller combustion process and the VTG turbocharger are a unique technical selling point in the area of high-volume petrol engines. In addition to use of the 1.5 TSI evo2 in a plug-in hybrid drive for the first time, the engine variant with the highest output of 130 kW1 is also making its debut. It was previously only available in the version with 110 kW1 as well as in a version with 96 kW (130 PS)1; the latter is used in the Golf and will also be used from now on in the new Tiguan.

**Miller cycle increases efficiency.** The TSI evo combustion process already familiar from the first 1.5 TSI evo is also used in the TSI evo2 generation. Alongside optimisation of combustion chamber cooling, the decisive factor here is the symbiosis of the Miller cycle (early closing of the inlet valves with high compression) and VTG turbocharging. The petrol-air mixture is run with lambda 1 efficiency throughout the entire operating range of the engine; the TSI thus does not run either too rich (excess petrol) or too lean (excess oxygen), as the fuel is burnt completely and cleanly. Thanks to this combustion process, the 1.5 TSI evo2 operates with a very high efficiency. This minimises consumption and emissions. Other technical parameters include high-pressure injection with up to 350 bar pressure, plasma-coated cylinder liners (lower internal friction) and pistons with cast-in cooling channels (optimisation of combustion). Both plug-in hybrid versions of the 1.5 TSI deliver their highest power between 5,500 and 6,000 rpm and their maximum torque of 250 Nm between 1,500 and 4,000 rpm.

**Electric drive motor with 85 kW and six-speed direct shift gearbox (DSG).** In its MQB models, Volkswagen uses a further developed hybrid gearbox: the DQ400e evo. The electric drive motor is integrated in this special six-speed DSG. The electric drive motor with the designation HEM80evo delivers 85 kW (115 PS) and a peak torque of 330 Nm, as described above. The electric drive motor forms a compact unit together with the new DQ400e evo.

**19.7 kWh high voltage battery.** According to forecasts, the new MQB plug-in hybrid models will have electric ranges of up to 100 km. The ranges were between 50 and   
80 km previously. The significant increase in range is achieved thanks to a new high-voltage battery. Its net energy content increases from 10.6 to 19.7 kWh compared with previous versions. The battery has a new cell technology for the 96 modules and external liquid cooling. Since the lithium-ion battery is also positioned in front of the rear axle, the interaction with the front-mounted drive (electric motor, DSG, TSI) results in balanced weight distribution.

**Energy management and charging with up to 50 kW.** The power flow between the battery and the electric motor is managed by new power electronics. This converts the direct current (DC) of the battery into alternating current (AC) for the electric drive motor. In addition, an integrated DC/DC converter supplies the 12 V electrical system. A new charger means it is now possible to charge with up to 11 kW instead of 3.6 kW at AC charging points such as the home wall box. With this, a discharged battery is charged to 100 per cent again in about two hours. For the first time, the new Volkswagen plug-in hybrid drives can be charged at DC fast charging stations with up to 50 kW. In this case, a battery discharged up to 10 per cent is charged to 80 per cent again in about 25 minutes. Starting with a full battery, typical European commuter distances (for example, from Frankfurt am Main to Wiesbaden and back in Germany) will now be able to be covered completely electrically. Metropolitan areas of this size will therefore benefit significantly thanks to the new Volkswagen plug-in hybrid models.

**EFFICIENT DRIVING – eTSI WITH 48 V SYSTEM**

**eTSI with 96 kW**1 **and 110 kW**1**.** Electricity can also be generated through the conversion of kinetic energy – the braking or recuperation power of a vehicle. The eTSI mild hybrid drives in the Passat, Tiguan and Golf make this possible. As in the new plug-in hybrid models (eHybrid), the 1.5 TSI evo2 also forms the technical centre of the powertrain. The eTSI is coupled to a 48 V lithium-ion battery and a 48 V belt starter generator that provides 15 kW power and 25 Nm torque. The 48-volt system acts like a type of electric booster and thus offers excellent moving-off performance. At the same time, the technology makes it possible for the 1.5 TSI evo2 to be completely switched off, thereby enabling coasting and temporary electric driving. A seven-speed DSG is standard for all variants.

**The eTSI in detail.** In addition to technical features such as the TSI evo combustion process and VTG turbocharger, the 1.5 TSI evo2 as eTSI is additionally equipped with enhanced Active Cylinder Management (ACTplus) compared with the version used in the eHybrid models. With ACTplus, two of the engine’s four cylinders are switched off as often as possible, depending on the operating situation. The second and third cylinders are designed to be taken out of the fuel supply at low and medium loads and speeds. Efficiency thus increases in the active cylinders, while the passive cylinders run almost loss-free. When the throttle is opened, they immediately become active again. Compared with the first 1.5 TSI evo generation, this switching on and off of the cylinders has been improved once more to guarantee smooth engine running. The switching operation itself is virtually imperceptible.

**The 48 V system in detail.** The 48 V system was designed to save fuel. Depending on driving style and ambient conditions, the saving can be up to half a litre per 100 km. The technical principle of 48 V technology permits transmission of higher electric power levels with smaller conductor cross-sections and a compact battery – thus also resulting in low additional weight. Compared with vehicles with pure 12 V technology, this leads to recuperation of a significantly larger amount of energy during braking or deceleration. The energy stored in the 48 V lithium-ion battery is used to drive a 48 V belt starter generator and to supply the 12 V on-board electrical system via a DC/DC converter. The water-cooled belt starter generator has the role of alternator and starter. At the same time, it acts as a compact electric motor, which increases the drive torque without any delay when moving off. The output of the generator is transferred by the belt drive. The generator also restarts the combustion engine – which is switched off as much as possible while the vehicle is moving. The bottom line is that the 48 V mild hybrid drive combines low consumption and emission values with excellent moving-off performance in daily operation.

**POWERFUL DRIVING – TSI, TDI AND 4MOTION**

**4MOTION with centrifugal pendulum.** In the new Tiguan, the 2.0-litre turbocharged petrol engines of the EA888 evo4 series deliver outputs of 150 kW (204 PS)1 and   
195 kW (265 PS)1. The 150 kW version transfers a maximum torque of 320 Nm via the DSG to the front axle, while the 195 kW version with maximum 400 Nm transfers the power via DSG to the all-wheel drive. Volkswagen will offer the current 2.0-litre turbocharged diesel engine of the EA288 evo series in two output versions in the Tiguan: with 110 kW (150 PS)1 and 360 Nm and 142 kW (193 PS)1 and 400 Nm. The   
2.0 TDI with 110 kW1 powers the front axle; the 142-kW1 version is coupled to the 4MOTION all-wheel drive system as standard. Volkswagen has developed a new centrifugal pendulum for the 4MOTION system that neutralises vibrations and optimises the acoustic comfort. In addition, the latest 4MOTION clutch, which features an intelligent energy management system, is used in the MQB evo models on the rear axle. When towing a trailer, for example, the Trailer driving profile is automatically activated to optimally control the distribution of power between the front and rear axles for trailer operation. The new Tiguan with all-wheel drive system is designed for trailer weights of up to 2,300 kg.

**ACTIVE DRIVING – DCC PRO**2 **AND VEHICLE DYNAMICS MANAGER AS NETWORK**

**Electronically controlled running gear.** The MQB evo provides the basis for a new running gear generation. Alongside numerous individual measures, Volkswagen has developed a new generation of the adaptive chassis control DCC for its bestselling models, the optional DCC Pro2. In addition, the new Tiguan and Passat Variant – as was already the case previously in the Golf – are now equipped with a Vehicle Dynamics Manager. The system controls the functions of the electronic differential locks (XDS) and the lateral dynamics components of the controlled shock absorbers in the DCC Pro system. Thanks to the Vehicle Dynamics Manager, which performs wheel-specific braking interventions and wheel-selective adjustments of the shock absorber hardness, the handling characteristics are more neutral, stable, agile and precise. The basic architecture of the running gear comprises a MacPherson front axle and an enhanced four-link rear axle.

**The fundamental operating principle of DCC.** The same applies to both the new and previous DCC systems: the electronic active damping control reacts continuously to the road conditions and driving situation and takes into account parameters such as steering, braking and acceleration. The ideal damping is calculated for each wheel and is adjusted via the shock absorbers within fractions of a second. The driver has the option of individually adjusting the DCC system to settings ranging from very comfortable to very sporty. The lateral dynamics components of the adaptive chassis control are coordinated and optimised via the Vehicle Dynamics Manager for optimum driving comfort and outstanding driving dynamics at all times.

**The DCC Pro in detail.** The new DCC Pro further improves the alliance of the adaptive chassis control and Vehicle Dynamics Manager. Compared with the familiar DCC with conventional single-valve shock absorbers, the shock absorbers of the new DCC Pro are equipped with two valves. This change is accompanied by an adapted control algorithm for separate rebound and compression stage control. The faster two-valve shock absorbers permit a better and quieter connection between the body and running gear at the same time as optimised driving dynamics – thanks to the even more precise control of the rebound and compression stages. Two-valve shock absorbers were used previously only in combination with multi-link suspension in the premium and luxury class; integration in MacPherson struts is new. The new adaptive chassis control system DCC Pro once more significantly increases the spread between the dynamic and comfort characteristics. Thanks to the interaction of these characteristics, the driver will enjoy an extremely pleasant driving experience and a sense of security even on poor road surfaces. Extremely comfortable body levelling is achieved through the reduction of body vibrations.

**ASSISTED DRIVING – PARK ASSIST PROVIDES SUPPORT**

**Park Assist Plus and Park Assist Pro**. The new Tiguan, Passat Variant and Golf will launch with a further developed range of state-of-the-art assist systems. The spectrum of park assist systems is new. Depending on the product line and equipment version, they come with optional or standard Park Assist Plus2, Park Assist Pro2 and the memory function for Park Assist Pro2. Park Assist Plus is a system that is already familiar from other Volkswagen models: it allows assisted driving into or out of parallel or bay parking spaces. The Volkswagen models take over control of acceleration, braking and steering for this purpose. If the vehicle is equipped with Park Assist Pro, the driver can also drive the vehicle into and out of parking spaces from outside the vehicle in the same situations. The driver controls the procedure using a smartphone app in this case. If the Volkswagen has the memory function for Park Assist Proon board, the system records the last 50 metres driven and thereby also the parking situation at the driver’s request. The parking manoeuvre can be stored when the vehicle has come to a stop. When the vehicle reaches the same position again – for example, the entrance to the carport at home – it automatically offers to take over parking independently. Independent driving out of a parking space is also possible. The driver can store up to five parking manoeuvres.

The assist systems of the new Tiguan at a glance:

* Oncoming vehicle braking when turning and swerve support
* Trailer manoeuvring system Trailer Assist2
* Adaptive Cruise Control (ACC)
* Hill Start Assist
* Park Distance Control (warning signals for obstacles at the front and rear
* Electronic Stability Control with counter steering assistance, ABS, TCS, EDL, engine drag torque control and trailer stabilisation
* Travel Assist2

Speed limiter

* Driver Alert System
* Autonomous Emergency Braking Front Assist with Pedestrian and Cyclist Monitoring
* Park Assist Pro2
* Park Assist Pro with memory function2
* Park Assist Plus2
* Proactive occupant protection system
* Rear view camera system
* Lane keeping system Lane Assist
* Lane change system Side Assist with Rear Traffic Alert and exit warning system
* Area View including rear view camera system2
* Dynamic Road Sign Display

**INFORMED DRIVING – MIB4 OFFERS INTUITIVE OPERATION**

**The new infotainment system in detail.** The new digital centre of the MIB4 (fourth-generation modular infotainment matrix) is the touch display of the infotainment system. The graphic interface, structure and menu navigation have been redesigned. The aim was to make operation simple, self-explanatory and customisable. To achieve this, the display has been divided into two touch bars at the top and bottom of the screen, as well as the home screen. The driver can assign favourite direct access functions to large areas of the top bar and home screen. The individually configured top bar and static bottom bar remain continuously displayed when the driver opens various functions in the form of apps on the home screen. This considerably simplifies operation. Additionally, the now backlit touch sliders are located under the infotainment system display and are used to adjust functions such as cabin temperature and volume.

**Top bar**. The top bar has a new direct access button on the left that lets the driver open the main menu with an overview of all apps with just one click. Next to this is a button for the new Car Control Centre, which offers direct access to the most important vehicle functions and can be configured individually by the driver. The main menu and Car Control Centre can be accessed at any time without having to close the active app, making operation much easier. There are additional direct buttons to which the available apps can be freely assigned on the right of the Car Control Centre.

**Home screen.** The large home screen in the middle combines the content of the most important apps on differently sized graphic tiles. Alongside classic content such as navigation, telephone or media, the tiles offer new functions such as suggestions from the new voice assistant. If one of the menu options from the top or bottom bar is activated, this app is also displayed in the individually configurable home screen.

**Bottom bar.** The bottom bar on the display provides access to the air conditioning and seat functions and has a home button in the middle of the bar that lets the driver return to the central home screen at any time. This means the air conditioning menu, temperature settings for the driver and front passenger and configurable air conditioning functions can always be accessed directly.

**The digital instruments in detail.** The latest MQB models have digital instruments on board as standard. With a display diagonal of 260 mm, they are larger than the Digital Cockpit of the predecessors. The graphic interface was also newly developed and the range of functions extended. Using the corresponding buttons on the multifunction steering wheel, the driver can select different basic graphic configurations (views) that can in turn be individually assigned functions. There will be a choice of four views: Classic, Progressive, Navigation and R-Line. Instead of R-Line, the Golf will get GTI, GTE and R as individual views.

**Classic.** In this classic view, the display has round instruments (rev counter and speedometer) on the left and right. In the middle is an area that shows information from the assist systems as well as the vehicle speed in digital form. The driver can also display information such as consumption and range or media information in the middle of the two round instruments.

**Progressive.** The round instruments are hidden in this view; content such as consumption, range and media information remains visible and is embedded in square fields. The information displayed in the middle area of the cockpit does not change compared with the Classic view.

**Navigation.** The navigation map and route guidance are shown on the display if the driver changes to this view. Turn instructions and information on the remaining journey time and distance are also displayed. In this case, the assist system information and digital speed display move to the bottom area of the display.

**R-Line.** The sportiest view, R-Line, uses the same basic layout as Navigation. In this case, the navigation map is replaced by a dark-coloured area and the R logo, a gear-change indicator and a horizontal rev counter in the upper area.