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Volkswagen

World premiere
The new Golf R

International Motor Show (IAA)

Frankfurt, September 2013

Notes:

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Power of the Golf R increased to 300 PS

Fuel consumption with DSG reduced to 6.9 litres per 100 km

New TSI propels Golf R with DSG to 100 km/h in 4.9 seconds

Golf R makes its debut with a new 4MOTION all-wheel drive system and progressive steering

Wolfsburg/Frankfurt, September 2013. It is the year of the Golf. The first six months of 2013 have already seen the debuts of the new Golf GTI, Golf GTD, Golf Estate and Golf TDI BlueMotion. Volkswagen is now continuing its Golf product offensive at the IAA in Frankfurt (10th to 2nd September). Along with the versatile Golf Sportsvan (concept car) and the zero-emission e-Golf, another car is making its debut in a world premiere as well: the flagship of the model series – the new Golf R. The sports car is powered by a newly designed 300 PS TSI (221 kW), which is 30 PS stronger but up to 18 per cent more fuel efficient than that in the previous model. Like all three previous Golf R models, the new model also transfers its turbocharged engine power to the road via a permanent all-wheel drive system; in this case, it is the latest version of the 4MOTION system with a fifth-generation Haldex coupling. Delivering pure dynamic performance are a newly configured sport suspension system (body height lowered by 20 mm), the new progressive steering system and "ESC Sport" – which can now be fully deactivated for driving on a race track. Optional highlights include the further developed DCC dynamic chassis control system with the driving profile selector that features a new Race mode.

The Golf R with a manual gearbox reaches 100 km/h after just 5.1 seconds (previous model: 5.7 s); with an automatic dual clutch gearbox (DSG) the sports car completes the classic sprint in an even faster 4.9 seconds. The car's top speed is electronically limited to 250 km/h. Despite the car's exceptionally

agile driving performance and 30 PS more power, fuel consumption of the Golf R was reduced from 8.5 to 7.1 l/100 km compared to that of the previous model. CO_2 emissions were also improved from 199 to 165 g/km. Even more fuel efficient is the Golf R that is equipped with a Stop-Start system and battery regeneration, together with the optional 6-speed dual-clutch gearbox (DSG). In this configuration, fuel consumption is 6.9 l/100 km (159 g/km CO_2). Fuel savings compared to the previous model with DSG (8.4 l/100 km) are 1.5 l/100 km, which represents the mentioned 18 per cent improvement.

The new Golf R is equipped with an extensive package of customised and exclusive features. Along with specially designed bumpers, side sills and 18-inch alloy wheels, the Golf R can also be visually distinguished as an impressive sports car by details such as standard bi-xenon headlights with newly designed LED daytime running lights (in dual-U design), dark red LED rear lights and two-branch exhaust system with four chrome tailpipes. Inside, the Golf R underlines its position as the flagship of the model range with sport seats in a “fabric-Alcantara” material mix, leather-trimmed three-spoke sport steering wheel, ambience lighting, automatic climate control and a radio-CD system with touchscreen. The market launch of the most powerful and fuel-efficient Golf R as a two and four-door car will take place in the fourth quarter of this year.

TSI engine of the Golf R

High-tech turbocharged engine. Like the current Golf GTI, the Golf R is powered by further advanced engine design of the four-cylinder EA888 engine series. Compared to the previous engine, numerous technical details were modified to reduce fuel consumption and emissions and at the same time to increase power and torque values. The engine has a newly designed cylinder head, for example. Compared to the 169 kW/230 PS Golf GTI Performance, designers boosted engine power of the Golf R by 70 to 221 kW/300 PS (from 5,500 to 6,200 rpm), creating one of the most powerful four-cylinder engines. Maximum torque has increased 30 Nm to 380 Newton metres; it is available over a broad speed range from 1,800 to 5,500 rpm. To attain these values, the TSI, with a displacement of 1,984 cc, was subjected to a development programme similar to that of a motorsport engine. The following components were modified or completely redesigned compared to the already highly agile GTI engine: the cylinder head (together with exhaust valves, valve seats and springs), pistons, high-pressure injection valves as well as the turbocharger.

Efficient thermal management. The turbocharged direct petrol injection engines of the EA888 series all have innovative detailed solutions such as water-cooled exhaust gas channels running through the cylinder head to the turbocharger (to reduce efficiently full-load fuel consumption) and a dual

injection system with direct injection and multi-port injection. Thanks to its new fully-electronic coolant control system, thermal management of the TSI in the Golf R is also much more efficient with a reduced warm-up phase; this reduces friction losses and fuel consumption. In addition, the TSI has variable valve timing with dual camshaft adjustment. In addition, valve lift on the exhaust side can be switched in two stages. This solution enables optimal control of the charge exchange process for better performance, fuel economy and low emissions.

4MOTION all-wheel drive in the Golf R

Fifth-generation Haldex coupling. Permanent 4MOTION all-wheel drive has always been a trait of the Golf R. The latest generation 4MOTION system is now being used in the fourth-generation Golf R. This all-wheel drive system is coupled with a 6-speed gearbox that has a reinforced clutch and short-travel shifting. Another optional feature is automatic shifting with a 6-speed dual-clutch gearbox (DSG) that also offers manual shifting as an alternative.

The 4MOTION all-wheel drive system of the Golf R, further perfected by enhancements such as the Haldex 5 coupling, is activated even before any wheel starts to slip. This eliminates nearly all traction losses. The system achieves this by using an advanced control function based on specific

driving conditions. When operating under a relatively low load or when coasting, forward propulsion comes primarily from the front axle, and the rear axle is decoupled. This basic drive layout saves fuel. However, the rear axle of the Golf R can be variably engaged in fractions of a second whenever necessary. This is done via a Haldex coupling, which is activated by an electro-hydraulic oil pump.

Situation-based power distribution. A control unit continually calculates the ideal drive torque for the rear axle and controls how much the multi-plate clutch should be closed by activating the oil pump. The oil pressure increases the contact pressure at the clutch plates in proportion to the torque desired at the rear axle. So, the amount of pressure applied to the clutch plates can be used to vary continuously the magnitude of the transmitted torque. The wheels of the 300 PS Golf R are prevented from spinning even when driving off and accelerating, because the control unit regulates the torque distribution as a function of dynamic axle loads. Activation of the Haldex 5 coupling is based primarily on the engine torque demanded by the driver. In parallel, a driving status identification system within the all-wheel drive control unit evaluates such parameters as wheel speeds and steering angle. If necessary, nearly 100 per cent of the drive torque can be directed to the rear axle.

Four-wheel EDS as transverse locks. In addition to the Haldex coupling that acts as a longitudinal lock, four electronic differential locks (EDS) integrated in the electronic stability control system act as transverse locks. The system briefly brakes a wheel that is slipping, enabling uninterrupted and stable transfer of drive power to the wheel on the opposite side. In the Golf R, the electronic differential locks are implemented at both axles in what is referred to as four-wheel EDS.

XDS+ makes tracking in bends more precise. In addition, the Golf R is equipped with XDS+ at the front and rear axles. This brakes the wheels on the inside of a bend during fast driving through bends, optimising steering behaviour. In the latest version, known as XDS+, this functionality is applied to a larger range of dynamic performance – making the vehicle more agile even when the car is not in an acceleration state. In technical terms, XDS+ is a functional extension of the electronic differential locks. When the car is being driven fast, as soon as the electronics detect excessively light loads on wheels on the inside of a bend, the hydraulics of Electronic Stability Control (ESC) apply brake pressure to this wheel to restore optimal traction. XDS+ thereby operates as a transverse differential lock that compensates for understeer during fast cornering.

ESC Sport. The new Golf R is equipped with the “ESC Sport” function as standard. The system is activated by a two-stage switch on the centre console. When the driver presses this switch briefly, Electronic Stability Control (ESC) switches to the “ESC Sport” mode. In very fast driving with lots of bends – such as on a race track – the ESC system reacts with a delay, which enables even more agile handling properties. When the ESC button is pressed for longer than three seconds, the system is fully deactivated for professional driving on a race track – this deactivation is only available in the Golf R and not in any other models of the Golf series.

Sport suspension of the Golf R

Synthesis of sportiness and comfort. The Golf R has a sport suspension setup that is individually tuned to the 300 PS all-wheel drive car. Compared to the base Golf, its ride height was lowered by 20 mm, which makes the Golf R 5 mm lower than the GTI. In the Golf R, a MacPherson-type front suspension (spring struts) with a newly developed low wishbone and track-stabilising scrub radius delivers optimal handling and steering properties and well-balanced vibration behaviour. The multi-link rear suspension of the all-wheel drive Golf R was enhanced in numerous areas; among other improvements, Volkswagen perfected this modular high-performance suspension’s lateral rigidity, which is necessary for steering, by implementing new bearing tuning of the steering link.

Dynamic performance. Engineers designed the basic tuning of the running gear of the new Golf R for maximum driving fun combined with extraordinary driving stability and good long touring comfort. Compared to the previous model, steering response was made even more agile with direct steering gear ratios by the car's progressive steering system. In addition, maximum attainable speeds were significantly increased when driving through bends. The running gear was tuned to be more neutral for this purpose, avoiding understeering all the way up to the car's performance limits.

The new calibration of the all-wheel drive system makes a decisive contribution towards achieving neutral handling. Response times of the Haldex coupling were minimized, and the drive torques that occur in specific driving situations were optimized for maximum neutrality, avoiding self-steering effects even under high load. The result is more uniform and predictable steering response in bends.

To attain optimal mechanical grip, stiffness values were precisely controlled for springs and anti-roll bars and intentionally designed not to be too stiff. In conjunction with the extremely fine adjustment of damper characteristics, the new Golf R shows an exceptional ability to follow the line the driver wants to drive precisely – on both flat and uneven route profiles. This makes handling very precise and smooth up to performance limits. The car's neutral handling in curves is also combined with very good driving stability thanks to the innovative layout of all running gear components. This excellent driving stability is especially noticeable in lane changes and load alterations. In tuning the new Golf R, the development team also focused on harmonious and predictable reactions of the running gear.

Ride comfort. Along with dynamic performance, suspension comfort was perfected compared to the previous model. The running gear harmoniously absorbs both small and large unevenness of the road surface. With the very large spread of positive properties mentioned – direct, neutral and stable handling combined with a high level of ride comfort – the running gear of the Golf R delivers a unique synthesis of maximum dynamic performance and ideal long touring capabilities.

Progressive steering. Like the Golf GTI, the Golf R is equipped with the newly developed progressive steering system as standard. Drivers do not need to turn the steering wheel as much to turn a desired radius; they also do not need to reach over the steering wheel as often in tight bends. With progressive steering, it takes 2.1 turns of the wheel (380°) to reach the end stop; with the standard steering system of less powerful Golf models it takes 2.75 turns (500°). Background: Conventional steering systems operate with a constant gear ratio. The new steering of the Golf R meanwhile operates with a progressive steering gear ratio. This perceptibly reduces steering effort in manoeuvring and parking.

On country roads with lots of bends, and when making turns, the driver experiences a plus in dynamics due to the more direct layout.

DCC. The new Golf R can be ordered with the second generation of DCC dynamic chassis control as an option. DCC offers the three driving modes ‘Comfort’, ‘Normal’ and ‘Sport’, which are now selected and displayed via the touchscreen on the centre console as part of the “Driving Profile Selector” functionality. In “Sport” mode, even more dynamic handling is implemented.

The DCC system adaptively controls the damper valves via a further developed and refined control algorithm for setting the damper characteristics. DCC takes input signals from wheel displacement sensors and accelerometers as well as vehicle information from the Chassis-CAN bus to compute these values and adaptively adjust the optimal damping force for every driving situation. Moreover, damping forces are selectively applied to the four wheels individually. With the new generation of DCC, it is now also possible to fully independently vary rebound and compression damping for transverse dynamic manoeuvres – a significant benefit in optimising vehicle dynamics.

Driving profile selector with Race mode. New in the Golf R is the Driving Profile Selector that is a standard feature of DCC. A total of four programmes are available, and five driving programmes in conjunction with DCC: “Eco”, “Normal”, "Individual” and the special “Race” mode that was specially tailored to the Golf R. In combination with DCC, there is also the “Comfort” mode. All modes were specifically tuned for application in the Golf R.

In “Race” mode, damping is increased (which further reduces movements of the body structure), and engine response and shift points of the (optional) DSG are configured to be even more dynamic. In the “Individual” driving profile, the driver can individually combine mode settings for the various single components. When in the “Eco” driving profile, on the other hand, the engine controller, air conditioning and other auxiliary units are controlled for optimal fuel economy. Vehicles with DSG also have a coasting function in Eco mode. When the driver releases the accelerator pedal – e.g. when slowing down to a traffic light or on route segments with descents – the DSG disengages and the engine idles, which enables optimal utilisation of the kinetic energy of the Golf R.

Brakes. The extremely durable brakes were also adapted to the higher power levels of the Golf R. Here, Volkswagen uses a 17-inch system with internally ventilated discs and black brake callipers (with

"R" logo) at all four wheels. In front, the brake pistons have a diameter of 60 mm, while 42 mm pistons are used at the rear. The 30 mm thick brake discs of the front wheels have a diameter of 340 mm; the rear discs are 22 mm thick and 310 mm in diameter.

Exterior of the Golf R

Customised styling. With the new Golf R, a successful concept has been transferred to the next vehicle generation – also design-wise. For the first time based on the Golf IV, the Golf R that is now presented emphasises the topic of absolute performance with its laid-back yet self-confident presence. Its status-neutral character and the typical Golf design constitute the foundation of the 'R'. Klaus Bischoff, Head of Design for the Volkswagen Brand: "Even the 'R' lives out the unique status neutrality of the Golf. It aims to create an exciting balance between respectability and sportiness, reservation and differentiation."

The Golf R is an independent product within the model range, with exclusive design themes and prized details. The design is integrative and makes for a seamless, all-of-a-piece look. Attachment parts are not perceived as such but as an integral part of the overall composition. The prominent graphics of the front with its distinctive air inlets demonstrates the uncompromising sports character of this vehicle.

The two sets of dual tailpipes, which make their first appearance in the history of the Golf, give the rear an inimitable signature.

The vision of a Golf R has been in the designers' minds right from the first line sketched on the drawing board. For them, this model is the freestyle part of their work in the design development of the Golf family. The appeal is to let the subtle yet unmistakable differentiation from the basic version come true. Philipp Römers from the Golf design team: “When I develop ideas for a new Golf, I always think of Golf and ‘R’ together. For me, the Golf is no longer imaginable without the ‘R’ top version. The features of the ‘R’ design have to live in their rudimentary form already in the first draft, so the ‘R’ later seems to be cast from a single mould.”

Front end. The Golf R can be distinguished from the front by a new bumper design with exceptionally large air inlets, modified radiator grille (with “R” logo) and newly developed daytime running lights that are integrated into the housings of the bi-xenon headlights. The LED daytime running lights form a distinctive dual “U” design beneath the dual headlights.

Side profile. From the side, the Golf R is characterised by newly designed 18-inch “Cadiz” alloy wheels with size 225/40 tyres, black brake callipers with “R” logo, side sill panels in “R” style painted in body colour, “R” badges on the front wings and “Matt chrome” door mirror caps. The sports car may also be ordered with optional 19-inch alloy wheels; Volkswagen R GmbH also offers “Cadiz” wheels in this size; in addition, “Pretoria” wheels are exclusively available in 19-inch format as “flow-forming” wheels (especially lightweight and sturdy) in motorsport design.

Rear section. Rear details that define the look of the new Golf R include smoked LED rear lights with a distinctive light-coloured stripe in the middle, diffuser in “R” design, four chrome tailpipes and an “R” logo on the boot lid.

Eight colours. The range of exterior paints comprises eight body colours. A new paint was created specifically and exclusively for the Golf R: “Lapis Blue Metallic”. Alternative colour choices are “Pure White”, “Tornado Red”, “Night Blue”, “Limestone Grey Metallic”, “Reflex Silver Metallic”, “Deep Black Pearl Effect” and “Oryx White”.

Interior of the Golf R

Sport seats in cloth/Alcantara and Carbon Leather. As in the three previous Golf R models, Volkswagen R GmbH has extensively customised and upgraded the interior of the new model as well. This most powerful Golf is equipped with what are known as top sport seats (front). The middle panels are designed in “Race” fabric (“Titan Black”) with black backstitching. Meanwhile, the side panels are executed in Alcantara (“Crystal Grey”). The outer surfaces of the seats and the head restraints are designed in “Clip” cloth upholstery (“Titan Black”). Decorative seams in “Crystal Grey” form a contrast to the dark areas. An “R” logo is embossed on the backrests of the front seats.

As an option, Volkswagen also offers a Nappa Carbon leather package. Here, the outer seat surfaces, inner side support panels and head restraints are all upholstered in dark “Carbon” Nappa leather. Meanwhile, the middle seat panels may be ordered in either dark or light Nappa leather (“Anthracite” or “Modern Grey”). The decorative seams are “Crystal Grey” in the leather upholstery version as well. Leather is also used to trim the three-spoke sport steering wheel in “R” design. Last but not least, the steering wheel’s lower cross bar has a chrome “R” logo. Here too, all leather elements are upgraded by decorative stitching in the contrasting colour “Crystal Grey”.

The decorative inlays of the dashboard and door trim panels feature the “Carbon Touch” design; ambience lighting is also integrated in the door trim panels as standard. The door sill guards are illuminated as well (in blue). The pedals and foot supports are also designed in stainless steel look as standard. Customisation extends down to the floor mats, which have upgraded piping in a contrasting colour.

Instruments in “R” design. The instruments and the start menu of the touchscreen on the centre console were also customised. To give a sporty feel from the very start, when the ignition is switched on the illuminated light-blue needles of the tachometer and speedometer sweep once across the entire scale to the end pin – in the case of the speedometer to the 320 km/h mark. The instrument needles are also automatically illuminated as soon as the driver’s door is opened. The touchscreen of the radio or radio-navigation system (Composition Touch radio is standard) shows an animated “R” logo as a start screen. Also new and upgraded with an “R” badge is the accessory used to start the Golf R: the ignition key, specifically its case; it represents perfection in the smallest details.

Radio and radio-navigation systems. Volkswagen is equipping the Golf R with redesigned radio and radio/navigation systems. All systems have a touchscreen as standard. The new device generation is available in three different display sizes: 5 inches, 5.8 inches and 8 inches. For the first time, Volkswagen is implementing displays that have proximity sensors (5.8-inch display and above): when the driver or front passenger moves a finger near to the touchscreen, the system automatically switches from display mode to input mode. The display mode shows a screen that is reduced to just the essentials. In the operating mode, on the other hand, the elements that can be activated by touch are specially highlighted to simplify intuitive operation. The displays also have a function that lets users use wiping motions to scroll through lists or browse CD covers in the media library.

Car Net. Car Net is offered for the Golf R in conjunction with the Discover Pro radio-navigation system and the “Premium” mobile phone interface. It consists of a set of new mobile online services. For example, Car Net lets drivers integrate highly up-to-date traffic information into dynamic route guidance and input Points of Interest (POI) into the navigation system online. It also integrates the 360-degree panoramic street perspective images of Google Street View. Realistic photographic satellite images can also be displayed, which are based on the Google Earth™ map service (Google Maps).


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