Quintessential Porsche driving dynamics and precise steering feel

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Porsche has developed the new Macan with a focus on outstanding driving dynamics and a responsive, direct steering feel. Thanks to a centre of gravity that is up to 140 mm lower than in its predecessor, new Porsche Active Suspension Management (PASM) with two-valve technology, Porsche Traction Management (ePTM), Porsche Torque Vectoring Plus (PTV Plus) and the rear-axle steering available for the first time in a Macan, the car delivers an exceptionally broad spectrum between comfort and performance. With its particularly sporty seating position, impressive driving dynamics and precise steering, the new Macan conveys a genuine sports car feeling. For its first all-electric SUV, Porsche is tapping into the full potential of electrification and raising the bar in every aspect of chassis development.

Aluminium double-wishbone front suspension with a separate control arm level supports the Macan's chassis, enhancing responsiveness, steering precision and directional stability thanks to its kinematics and elastokinematics. At the rear axle, Porsche developed the 'Performance' styling for the Macan. The

electric motor has been rotated around the vehicle's transverse axis and positioned as far to the rear as possible. This enables the desired rear-biased weight balance. In the Turbo the weight distribution is 48 per cent front and 52 per cent rear, On the rear-wheel-drive Macan, 54 per cent of the car's weight is on the rear axle.

In the Macan and Macan 4, the drive unit is mounted within the chassis subframe, while the 4S's drive unit is attached directly to the body via four mounting points. The separate connection between the axle and the electric motor creates space for rear-axle steering and for the PTV Plus rear differential lock, which is included as standard in the Turbo.

Porsche Traction Management distributes drive power within milliseconds

The two electric motors in the all-wheel-drive models of the new Macan are controlled individually, and almost in real time, via the power electronics. The electronically controlled Porsche Traction Management (ePTM) operates around five times faster than a conventional on-demand all-wheel-drive system and can respond to slip within 10 milliseconds. In addition, the torque distribution is governed by the selected driving programme. In 'Normal' mode, the drive distribution is designed for high efficiency and range. This means that rear-wheel drive is used as often as possible. In Sport and Sport Plus modes, the focus of the ePTM is on optimising traction; the drive on the front axle is engaged more frequently. In off-road driving mode, the Macan switches to all-wheel drive with a 'rough road' configuration. The differential speed between the front and rear axles is limited by a virtual centre-differential lock, which improves traction. In addition, High Level I is activated, increasing the ride height by 20 mm. A lift of 40 mm is achieved in High Level II.

In addition to ePTM, Porsche Torque Vectoring Plus (PTV Plus) – an electronically controlled differential lock on the rear axle – also aids traction, driving stability and lateral dynamics in the Macan Turbo. The control strategy of PTV Plus depends on the particular driving situation. The rear differential lock and carefully measured, dynamic braking interventions on the rear axle support the steering behaviour and steering precision in a targeted manner. For the Macan 4S, PTV Plus is available as an option.

Rear-axle steering for even more agility and stability

For the first time, the Macan features optional rear-axle steering, with a maximum steering angle of five degrees. This enables a compact turning circle of 11.1 m in urban traffic and when manoeuvring. It also enables exceptional driving stability at higher speeds, assisted by the consistent and precise front-axle steering for which the brand is known.

At speeds of up to about 80 km/h, the rear wheels steer in the opposite direction to the front wheels, with a maximum steering angle at the rear axle of up to five degrees when parking. This makes

manoeuvring easier, the turning circle is reduced by around one metre and the steering angle requirement of the steering wheel is reduced by up to 24 per cent. This virtual shortening of the wheelbase by means of rear-wheel steering also results in a more responsive turn-in when cornering. At speeds above approximately 80 km/h, the rear wheels steer in the same direction as the front axle. As a result, the wheelbase is effectively lengthened, further increasing driving stability, for example when changing lanes on the motorway.

The rear-wheel steering is accompanied by a 15 per cent more direct steering ratio on the front axle. The front-axle steering in the Macan is uncompromisingly Porsche-like and offers maximum precision in all steering manoeuvres. Combined with highly responsive dynamics, this results in optimal control. The control unit for the Porsche-developed power-assisted steering identifies and amplifies important steering information for the driver, such as the surface characteristics of the road and the grip level of the tyres. Disruptive vibrations and bumps, on the other hand, are eliminated and not transferred to the steering wheel, giving the driver a clear and direct steering feel.

PASM damper control offers greater performance and comfort

Macan models with air suspension (standard on the Macan Turbo, optional on the other models in Europe) are equipped with Porsche Active Suspension Management (PASM) electronic damping control. PASM can also be combined with the steel spring suspension – standard on the 4S in Europe. The system reacts to the condition of the road but also to speed, longitudinal and lateral acceleration, accelerator actuation, steering input and the ride-height setting of the car.

PASM now also features shock absorbers with two-valve technology. The rebound and compression levels can be individually controlled. This enables very fast switching between performance and comfort, as well as the ability to apply maximum damping force in both directions. Compared to single-valve technology, the force potential in the pressure range is significantly greater. This ensures excellent pitch and roll support as well as a high level of body stability. Thanks to the more expansive damper map, this results in a wider spectrum of comfort and performance. This makes the differences between the driving modes even more tangible. In conjunction with air suspension, each individual driving programme has its own ride-height setting. Depending on speed, the body can be lowered by as much as 30 mm below the standard ground clearance of 185 mm, which benefits the range of the vehicle thanks to the reduced drag. At High Level II, the ground clearance is raised to up to 225 mm.

The wheel and tyre setup in the Macan is also characteristically Porsche. This is particularly evident in the staggered wheel fitment: the wheel widths on the front and rear axles differ significantly to accommodate the rear-focused weight distribution – for increased grip and improved driving dynamics. Further performance potential arises from the wheel sizes (which range from 20 to 22 inches in diameter) and the newly developed performance tyres, which shorten the braking distance by six per cent compared to the standard summer tyres and are characterised by even greater performance in dry conditions. The performance tyre is only available in conjunction with the 22-inch RS Spyder design wheel.

In keeping with the dynamic driving performance, the Macan models deliver characteristic Porsche braking performance in all driving situations – although the high recuperation capacity of up to 240 kW, depending on the model, means that the mechanical brakes are used much less frequently. The brake pads and brake callipers have been completely redeveloped for the all-electric SUV. The callipers have significantly reduced residual brake torque in order to support the range requirements. All models have grey cast iron brakes at the rear with 350 x 30 mm discs and combined floating-calliper brakes. At the front, the Macan and Macan 4 feature four-piston aluminium fixed-calliper brakes with discs measuring 350 x 34 mm, while the Macan 4S and Macan Turbo feature six-piston aluminium fixed-calliper brakes with discs measuring 375 x 36 mm and 400 x 38 mm, respectively.

New off-road design package: available for all models

The off-road design package further enhances the Macan's everyday practicality: rough dirt tracks and particularly steep climbs and descents can be mastered even more easily than before. The adapted geometry of the front bumper has increased the approach angle to up to 17.4 degrees, depending on the model (with the air suspension at a specifically raised level). In combination with the adaptive air suspension, the off-road design package also increases the ground clearance by 10 mm to 195 mm when in the 'Normal' setting.

MEDIA ENQUIRIES

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Consumption data

Macan Turbo (WLTP)*: Electrical consumption combined: 20.7 – 18.4 kWh/100 km; CO_2 emissions combined: 0 g/km; CO_2 class: A

Macan 4 (WLTP)*: Electrical consumption combined: 20.5 – 17.8 kWh/100 km; CO_2 emissions combined: 0 g/km; CO_2 class: A

*Further information on the official fuel consumption and the official specific CO_2 emissions of new passenger cars can be found in the "Leitfaden über den Kraftstoffverbrauch, die CO_2-Emissionen und den Stromverbrauch neuer Personenkraftwagen" (Fuel Consumption, CO_2Emissions and Electricity Consumption Guide for New Passenger Cars), which is available free of charge at all

sales outlets and from DAT (Deutsche Automobil Treuhand GmbH, Helmuth-Hirth-Str. 1, 73760 Ostfildern-Scharnhausen, www.dat.de).

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