



Quintessential Porsche driving dynamics and precise steering feel

12/04/2024 Quintessential Porsche driving dynamics and precise steering feel

Porsche has developed the new Macan with a focus on outstanding driving dynamics and a sporty, 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, which enhances responsiveness, steering precision and directional stability thanks to its kinematics and elastokinematics. The Macan Turbo also scores points with its high-performance rear

end. The electric motor has been rotated around the vehicle's transverse axis and therefore positioned further to the rear. This enables the desired rear-biased weight balance of 48 per cent in the front and 52 per cent at the back. In the Macan 4, the drive unit is mounted within the chassis subframe, while the Turbo's drive unit is attached directly to the body via four points. The separate connection of the axle and electric motor enables the engine and suspension mounts to be tuned separately to the respective optimal configuration. The body in the Macan also offers space for a rear axle steering system and the PTV Plus rear differential lock, which is standard in the Turbo.

Porsche Traction Management distributes drive power within milliseconds

The two electric motors in 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 hang-on all-wheel drive system and can respond to slip within 10 milliseconds. In addition, the all-wheel drive 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 (plus 20 mm or plus 40 mm in High Level II) is activated.

As well as the ePTM, Porsche Torque Vectoring Plus (PTV Plus), an electronically controlled differential lock on the rear axle, contributes to traction, driving stability and lateral dynamics in the Macan Turbo. The control strategy of the PTV Plus depends on the respective 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.

Rear-axle steering for even more agility and stability

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

At speeds of up to around 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 through the 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 high-actuator dynamics, this results in optimal control. The Porsche-developed power steering support identifies and amplifies important steering information for the driver, such as the surface characteristics of the road and the grip capability 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 Macan 4 in Europe) are equipped with Porsche Active Suspension Management (PASM) electronic damping control. PASM can also be combined with the steel-spring suspension as an option. The system reacts to the condition of the road but also to speed, longitudinal acceleration and lateral cornering force, accelerator actuation, steering input and the ride-height setting of the car.

PASM now also features dampers with two-valve technology, in which the rebound and compression levels can be individually controlled. This makes it possible to switch between performance and comfort at lightning speed and apply the 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 programmes 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 up to 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 classic 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 more grip and improved driving dynamics. Further performance potential is provided by 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 better performance in dry handling. The performance tyre is only available in conjunction with the 22-inch RS Spyder design wheel.

In keeping with the sporty driving performance, the Macan models deliver characteristic Porsche braking performance in all driving situations – although the high recuperation capacity of up to 240 kW

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. Both models have grey cast iron brakes at the rear with 350 x 30 mm discs and floating callipers. At the front, the new Macan 4 features four-piston aluminium fixed-calliper brakes measuring 350 x 34 mm while the Macan Turbo features six-piston aluminium fixed-calliper brakes measuring 400 x 38 mm.

MEDIA ENQUIRIES



Ben Weinberger

Spokesperson Cayenne und Macan
+49 (0) 170 / 911 2097
ben.weinberger@porsche.de

Consumption data

Macan Electric Models

Fuel consumption / Emissions

WLTP*

Electric power consumption* combined (WLTP) 21.1 – 17.9 kWh/100 km

CO emissions* combined (WLTP) 0 g/km

CO2 class A Class

Macan Turbo Electric

Fuel consumption / Emissions

WLTP*

Electric power consumption* combined (WLTP) 20.7 – 18.8 kWh/100 km

CO emissions* combined (WLTP) 0 g/km

CO2 class A Class

Macan 4 Electric

Fuel consumption / Emissions

WLTP*

Electric power consumption* combined (WLTP) 21.1 – 17.9 kWh/100 km

CO emissions* combined (WLTP) 0 g/km

CO2 class A Class

*Further information on the official fuel consumption and the official specific CO emissions of new passenger cars can be found in the "Leitfaden über den Kraftstoffverbrauch, die CO-Emissionen und den Stromverbrauch neuer Personenkraftwagen" (Fuel Consumption, CO Emissions 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).

Link Collection

Link to this article

<https://newsroom.porsche.com/en/press-kits/Der-neue-Macan-4-und-Macan-Turbo/Fahrwerksysteme.html>