Engine and performance

Eight-cylinder biturbo engine delivers dynamic power, efficiency and an emotional drive

The new Panamera GTS and new Panamera GTS Sport Turismo both benefit from the same V8 biturbo engine generation as the Panamera Turbo models. During the development phase, Porsche's engineers focused on ensuring maximum efficiency and exceptional performance. At speeds between 6,000 and 6,500 rpm, the four-litre engine in the new Panamera GTS models delivers peak output of 338 kW (460 hp), outperforming the 4.8-litre V8 engine in the predecessor by 20 hp. The maximum torque of 620 Nm – 100 Nm more than the previous model – is available at speeds between 1,800 and 4,500 rpm. The new eight-cylinder model accelerates the Panamera GTS and the Panamera GTS Sport Turismo from 0 to 100 km/h in 4.1 seconds thanks to the standard Sport Chrono Package. The saloon reaches a speed of 200 km/h in just 15.4 seconds; the Sport Turismo achieves the same in 15.6 seconds. The Gran Turismo reaches a top speed of 292 km/h while the Sport Turismo tops out at 289 km/h. Their exceptional performance is achieved with moderate consumption of just 10.3 l/100 km (Sport Turismo: 10.6 l/100 km); it has a CO_2 emission level of 235 g/km (Sport Turismo: 242 g/km).

In view of the stricter particulate emissions limits set out in the new EU emissions standards for the European Union and other markets applying its standards, the launch of the new Panamera GTS models will see all vehicles for these markets fitted with a gasoline particulate filter, which will also be installed in all Panamera models from the new model year. They therefore comply with the Euro 6 d-Temp (EU6 BG) emission standard as well as C6b in China. The structure of this sealed ceramic filter is similar to the particulate filter for diesel engines, though with some adaptations needed to meet the requirements for petrol engines. The exhaust gases are fed through alternately sealed channels, forcing the gas to flow through the walls of the particulate filter. Particulate deposits are burned off in an automatic regeneration process.

In design terms, the eight-cylinder model is a V-engine installed longitudinally with a bank angle of 90 degrees. The four intake and exhaust camshafts can be adjusted by 50 degrees and are powered by a chain drive. The four-valve engine can reach a speed of up to 6,800 rpm and has a displacement of 3,996 cm^3. The stand-out technical feature of the V8 biturbo direct petrol injection model is its new central turbo layout with turbochargers located in the inner V, injectors in the centre of the combustion chamber, race track-compatible oil system, very low-wear coating on the cylinder liners and cylinder deactivation.

The standard sports exhaust system with its black twin tailpipes and specially tuned interaction between the engine and exhaust valve control gives the V8 engine its rich, distinctive sound.

Central turbo layout ensures powerful torque at low revs

The V8 engine in the new Panamera GTS models exhibits an incredible degree of agility, even at the higher end of the rev and power range. At the same time, the eight-cylinder unit is able to deliver maximum torque at low speeds. These drive characteristics are due primarily to the biturbo charging technology in the central turbo layout. Carefully designed

twin-scroll turbochargers supply compressed air to the V8's combustion chambers. The two turbines rotate in opposite directions and deliver maximum torque, even at the lowest rev levels. The turbochargers achieve a maximum charge pressure of 0.8 bar. A compressor powered by the exhaust gas flow compresses the intake air for each turbocharger. To allow the engine to respond effectively, the process air runs through two separate branches. After flowing through the left and right intercoolers upstream from the V8, the process air from outside the vehicle passes through one throttle valve on each side into the left and right cylinder banks. The intercoolers significantly reduce the temperature of the process air once it has been heated during the compression process. This boosts the density of the air, increasing the oxygen content in the cylinder and improving efficiency as a result.

Central injectors

One key feature of all Panamera engines is the central location of the injectors and their high-pressure injection valves inside the combustion chamber. The V8 engine found in the new Panamera GTS models uses valves with seven nozzle holes. The individually aligned nozzles help to optimise combustion, thereby reducing emissions and increasing efficiency. And Porsche achieves this in every single operating phase. Its engineers have used injectors to employ individual injection strategies while the engine is starting, while the catalytic converters are heating up, while the engine is warming up and while the engine is warm. Each cylinder bank is equipped with a high-pressure pump with a maximum injection pressure of 250 bar.

Exhaust gas after-treatment with catalytic converters in the inner V

The V8 engines are equipped with a dual-branch exhaust system with pre and main catalytic converters plus upstream and downstream silencers. In design terms, the eight-cylinder engine is similar to the central turbo layout in that its catalytic converters are located in the inner V, close to the engine. This configuration ensures that the emission control system reaches the ideal operating temperature in a short space of time. Furthermore, catalytic converter heating is accelerated during the start-up phase by opening the turbocharger wastegate valve.

Iron alloy in the cylinder linings reduces wear and oil consumption

One of the V8 engine's highlights is the iron coating on the cylinder linings in the cast aluminium block. This significantly reduces internal friction, wear (even when using low-quality fuels), and oil consumption. During the production process, the surface of the cylinders is coated with an exceptionally durable, low-friction iron coating using an atmospheric plasma spray method. The coating is just 150 micrometres thick. This iron alloy almost completely eliminates any lining wear at the reversal point on the piston rings. The design of the lightweight cast pistons has been adapted in line with the new alloy. The piston rings have a chromium nitrite coating, which perfectly matches the iron coating When combined, all of the measures reduce oil consumption by up to 50% compared to its predecessor.

Reliable oil supply, even on the race track

Every Porsche has to be able to hold its own out on the track. The new Panamera GTS models confidently master this challenge – partly thanks to their innovative oil system. Its

layout ensures that even the most extreme lateral and longitudinal acceleration forces can be balanced out. A key aspect of this system is the fact that the oil ducts are split into two separate supply branches – one for the engine and one for the cylinder heads. The supply openings in these ducts have been tailored to each component in the oil system. During the start-up phase, this has a positive impact on the time needed to build up pressure in the oil. The speed at which pressure is built up is also supported by a return valve in the oil pump. This valve makes sure that the large volume of oil in the inner V does not flow back into the oil sump and run empty. The oil pressure itself is built up by a fully variable vane oil pump and can be regulated to the specific engine operating map via a valve. This control valve also comes with a built-in oil pressure limiter, which is automatically activated during the engine start-up phase and at low ambient temperatures. Depending on demand, an electronic switching valve located in the centre of the inner V also controls the map-controlled piston spray nozzles for cooling the pistons. This control function reduces churning losses and controls the amount of oil in circulation. As a result, the GTS models can even cope with the high longitudinal and lateral acceleration forces on the Nürburgring's famous Nordschleife.

Fitted as standard: Sport Chrono Package with Sport Response Button

Perfectly tailored to racetrack driving, the new Panamera GTS models are equipped with a standard Sport Chrono Package with Launch Control and mode switch, plus a Sport Response Button on the multifunction steering wheel. Thanks to its ergonomic position on the steering wheel, the rotary mode switch provides the driver with direct access to the four driving modes (Normal, Sport, Sport Plus and Individual). Sport Plus mode is ideal for the track. This mode adjusts the drivetrain so that it can deliver the ideal vehicle response and maximum acceleration. What's more, active chassis components – such as the adaptive air suspension, Porsche Active Suspension Management (PASM) and the optional Porsche Dynamic Chassis Control Sport (PDCC Sport), Porsche Torque Vectoring Plus (PTV Plus) and rear axle steering – switch to a sportier mode for ultimate performance. The Sport Response Button is located in the middle of the mode switch. This button delivers the Panamera's maximum power potential for 20 seconds at the mere touch of a button. During this time, the engine response is more direct and spontaneous. The PDK also switches to an even more dynamic shifting map than in Sport Plus mode, immediately lowering the revs to a range between 3,000 and 6,000 rpm (unless the button is pressed in full-load operation). Gear changes take place very late.

Porsche eight-speed PDK for optimum comfort and maximum agility

Like all other Panamera models, the new GTS versions also come with an eight-speed dual clutch gearbox. In general terms, the eight-speed PDK allows for the ideal gear ratio spread and efficient fuel consumption, while still delivering optimum comfort and maximum agility. That is because the seventh and eighth gears are designed as rev-reducing overdrive gears. Maximum speed can be achieved in sixth gear. The Panamera's eight-speed PDK can change gear without interrupting the tractive power because the next gear ratio is essentially already waiting in the wings, ready to be activated within fractions of a second. The sporty yet exceptionally comfortable gear shift patterns of the PDK are the perfect match for the dynamic characteristics of the new Panamera GTS models.

Active four-wheel drive with electronically controlled multi-plate clutch

The Panamera GTS and Panamera GTS Sport Turismo deliver power to the road via the Porsche Traction Management (PTM) function – an active four-wheel drive system with an electronically controlled, map-based multi-plate clutch. Depending on the driving situation, the multi-plate clutch spreads the engine's power between the front and rear axles to achieve optimum performance at all times. The PTM sensors continuously monitor the wheel speeds, the longitudinal and transverse acceleration forces, and the steering angle. The PTM delivers perfect performance, regardless of whether the roads are dry, wet or covered in snow.