Instantaneous responsiveness and precisely coordinated interplay. One of the two small turbos is activated at engine speeds just above idle. Its low moment of inertia allows it to respond without delay to the slightest movements of the accelerator and therefore supply the combustion chambers with compressed air at an early stage. As revs increase, the flow of exhaust gas also reaches the larger turbocharger, which announces its arrival with the engine spinning at just 1,500 rpm. Working together with the small charger, it ensures that the impressive peak torque of 740 Newton metres (546 lb-ft) is generated at this low engine speed and maintained up to 3,000 rpm.

To further increase the performance of the large turbocharger, a greater volume of exhaust gas is required at around 2,700 rpm. If the driver calls up additional power, a vacuum-modulated exhaust flap instantly opens up another supply route, allowing extra exhaust gas to flow past the already active high-pressure charger to the large low-pressure turbo. The third turbocharger – integrated into this bypass line – also has a low moment of inertia and variable compressor geometry, which allow it to spring into action as soon as the exhaust flap opens. The result is additional charge pressure, generated by two sources at the same time. The large turbocharger is able to deliver its full output, while the second small turbo builds on the effect of its two active colleagues by supplying even more compressed air to the combustion chambers. This arrangement allows the turbocharging system to drive the engine with forceful and sustained thrust to its maximum output of 280 kW/381 hp, which it notches up between 4,000 and 4,400 rpm. The maximum engine speed of the new diesel powerplant is 5,400 rpm.

In order to ensure that charge pressure is developed as effectively as possible, not to mention efficiently, both the exhaust flow and supply of fresh air to the turbos and the channelling of compressed air into the combustion chambers is regulated with maximum precision. If the large turbocharger is spinning at particularly high speeds, a vacuum regulator opens a wastegate valve to relieve the pressure and so avoid unwanted exhaust backpressure. The supply of fresh air is also controlled according to need by means of pneumatically activated flaps. For example, at low revs a bypass flap ensures that the air is channelled directly to the high-pressure charger, which spins into action very early. At less than 2,700 rpm a change-over flap keeps the air away from the