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Scania's 13-litre engine – a breakthrough for gas in long-distance transport

- Scania's new gas trucks are suitable for both long-distance transport and construction operations.
- 410 hp and 2,000 Nm – in line with diesel engines of a similar size
- A service interval of 45,000 kilometres guarantees a high uptime with the OC13
- The OC09 is also now available for the new truck generation.

Scania's launch of the OC13 and OC09 gas engines marks the start of a Scania product offensive centred on alternative fuels for the new truck generation. The OC13 is based on Scania's well-known 13-litre engines, but it is a newly-developed engine that runs on gas using the Otto principle, with spark plugs and complete combustion. At the same time, an updated OC09 is being introduced into the new truck generation.

The interest in running vehicles on biogas or natural gas is growing rapidly in markets around Europe as a result of increased availability, a growing infrastructure and good operating economy for hauliers. The sustainability aspects are naturally also important; even for those that run on natural gas, there is a CO₂ reduction of about 15-20 percent.

Underlying technology

Scania's gas engines are based on stoichiometric combustion – i.e., complete combustion of both fuel and oxygen. Combustion is initiated using spark plugs, as is the case with petrol engines, and pre-mixing of the fuel takes place on the way into the cylinders.

"An important goal for us in the development work has been to ensure the best possible driveability, so that the performance and characteristics will correspond to what one expects from a modern diesel engine," explains Folke Fritzson, a Senior Engineer at Scania R&D who has been involved in developing Scania's gas engines.

The new 13-litre gas engine always runs in combination with Scania Opticruise, Scania's automated gearbox. This means, of course, that the driver has first-class gear changing and driving comfort, with fast, unhesitating gear selections.

Well-thought-out tanks

The type of tank solutions that are offered is always an important aspect of gas engines. Both LNG tanks (for liquefied natural gas) and CNG tanks (for compressed natural gas) can be ordered directly from Scania. LNG always provides greater range, as a significantly larger amount of fuel can be obtained.



“Once in the engine, it does not matter how the gas has been stored, but there are significant differences in the scale of the range obtained with each solution,” Fritzson says. “With LNG, it’s in the region of 1,000 kilometres for a typical trailer tractor on a flat road. But a CNG solution, which usually provides a range of 400 to 500 kilometres, is also more than sufficient for many customers, such as those whose assignments involve regional operations with a return to the home base and the refuelling point every day. But the mileage that can be achieved from a full tank also depends on the type of operations involved, and how hilly the route is.”

A particular safety aspect is that Scania’s engineers have turned the tank valves backwards, away from the direction of travel. This is an apparently simple but well-thought-out detail that reduces the risk of the valves becoming damaged by being hit by external impact.

Extended maintenance intervals

Gas engines that operate on the Otto principle (with pre-mixing of fuel and with spark plugs) have shorter service intervals than diesel engines. However, Scania’s engineers have implemented a series of measures that help bring about a significantly longer service interval. Today it is the service life of the spark plugs that typically sets the limits.

“We have set the interval at 45,000 kilometres for both spark plug replacement and oil changes under normal use,” Fritzson says. “This is a clear improvement over previous generations of gas engines, which had a normal service interval of 30,000 kilometres. This reduces maintenance costs and increases uptime.”

“Everything indicates that in a number of markets we are making a breakthrough with gas engines, including those for heavier long-distance trucks and construction vehicles,” Eng says. “Nobody now needs to do without characteristics such as good driveability or driver comfort. At the same time, we are seeing that a rapidly-growing infrastructure goes hand-in-hand with an increasing interest among potential customers in starting to use all the gas that is available in a number of European markets.”



Scania is starting to focus on alternative fuels for the new truck generation, with the world première of a new 13-litre gas engine. The new gas engine is combined with Scania Opticruise and can be used, for example, for heavy long-distance operations with typical semi-trailer combinations.



OC09 – a true power unit

While the OC13 is making its debut, the OC09 is also being introduced into the new truck generation, in a partly-updated version. Early on, Scania brought out engines that ran on biogas or natural gas and complied with Euro 6. These are Scania's well-known five-cylinder inline 9-litre engines, which, just like their larger relatives, operate on the Otto principle and can be run on all types of vehicle gas.

In characteristic Scania style they have an unusually high torque for the engine type, which makes them useful in a number of different applications. As gas engines are generally quieter than diesel engines, they also work well in sensitive urban environments for different forms of distribution or maintenance applications, especially at night. All three of Scania's Euro 6 gas engines also meet the requirements of the PIEK noise-limitation standard, which stipulates a level of no more than 72 dB(A) in zones with a high risk of disturbance.



Scania is offering its 9-litre gas engine in two power levels for Euro 6 – 280 or 340 horsepower. It is now making its debut in the new truck generation and will then be able to offer a reduction in gas consumption due to an improvement in aerodynamics, just like its diesel siblings.

Using natural gas in the tanks reduces CO₂ emissions by 15-20 percent, while the use of bio-methane gas can result in a CO₂ reduction of up to 95 percent. But regardless of the type of gas used, the driveability of Scania's gas engines is in line with what conventional diesel engines can offer in terms of torque and power.

"Gas, and of course bio-methane in particular, are of particular interest from a European perspective with the potential for reductions in both CO₂ and other emissions," says Eng. "This engine is the starting point for Scania's extensive offering for sustainable transport combined with the new truck generation."



Technical data

	OC09 104 280 hp	OC09 105 340 hp	OC13 101 410 hp
Type	Inline		
Displacement	9.3 litres		12.7 litres
Firing order	1-2-4-5-3		1-5-3-6-2-4
Cylinders	5		6
Valves per cylinder	4		
Bore x stroke	130 x 140 mm		130 x 160 mm
Cam type	Normal		
Compression	12.6:1		12.6:1
Fuel injection	Bosch		
Emission control	Scania EGR and 3-way catalytic converter		
Oil capacity	31 litres		43 litres
Max. output	280 hp (206 kW) at 1900 rpm	340 hp (250 kW) at 1900 rpm	410 hp (302 kW) at 1900 rpm
Max. torque	1350 Nm at 1100-1400 rpm	1600 Nm at 1100-1400 rpm	2000 Nm at 1100-1400 rpm

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Scania is a world-leading provider of transport solutions. Together with our partners and customers we are driving the shift towards a sustainable transport system. In 2016, we delivered 73,100 trucks, 8,300 buses as well as 7,800 industrial and marine engines to our customers. Net sales totalled nearly SEK 104 billion, of which about 20 percent were services-related. Founded in 1891, Scania now operates in more than 100 countries and employs some 46,000 people. Research and development are concentrated in Sweden, with branches in Brazil and India. Production takes place in Europe, Latin America and Asia, with regional production centres in Africa, Asia and Eurasia. Scania is part of Volkswagen Truck & Bus GmbH. For more information visit www.scania.com.