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Scania's new generation of trucks: Powertrain innovations that cut fuel costs by 3%

- Scania's goal to be the leader in sustainable transportation is reflected in a general energy consumption reduction
- All engine platforms get a 3% consumption reduction
- Overall fuel savings of 5% generally, thanks to improved aerodynamics and intelligent functions
- New version of Scania's inline 500 hp 13-litre engine
- Lay shaft brake cuts gearshift times in Scania Opticruise by 45%
- The adaptive cruise control system can now be used to make driving in slow-moving queues easier

In the new truck range from Scania, all Euro 6 engines have received new engine management systems and the installations have been completely overhauled. The improved cooling capacity with the new cabs provides the opportunity for further fuel savings of 3% on average which will, of course, have a positive impact on Scania customers' profitability. Scania is also introducing a new version of its 13-litre engine with 500 hp. Furthermore, a new gearshift function is being introduced, allowing Scania Opticruise to shift faster and deliver almost constant momentum.

"With the latest updates, we can guarantee a further reduction in consumption in the region of 3% for all the diesel powertrains in our new truck range," says Björn Westman, Scania's Head of Engine Development. "On top of that, there are of course other consumption reductions such as aerodynamic improvements, the option of choosing an axle with an even faster gear ratio of 2.35 in situations with the right driving conditions and precisely customised configurations for each driving assignment."

All four Scania 13-litre engines, topped by the new 500 hp version, now use only SCR for exhaust after treatment. It is Scania's positive experiences in the form of reduced consumption and even greater reliability with only SCR that have led the way in the development of the latest generation.



Scania's inline six-cylinder 13-litre engine requires only SCR (Selective Catalytic Reduction) for after treatment of exhaust gases in order to meet Euro 6. The already class-leading Scania engines are now even more economical with fuel thanks to a mild redesign and further-developed cooling.

"Our inline 13-litre engines perform fantastically well with only SCR and a robust turbocharger featuring fixed geometry," says Björn Westman, Scania's Head of Engine Development. "With this addition we are, from a power perspective, offering a concept that appeals to a large number of customers in a wide range of applications."

Among the changes are a reworked combustion chamber and new injectors, producing a saving of 0.2-0.5%. Furthermore, the generally higher working temperature and the thermostatic oil cooling contribute to additional savings, together with the fact that the cooling fans (which in some cases have a larger diameter) are now directly driven without energy-intensive gearing. This can contribute a fuel saving of up to 1%, due to the oil being kept at optimum temperature, even at lower power outputs and at low outdoor temperatures.

"In addition to the engine changes, customers can expect savings of another couple of percent," says Björn Fahlström, Vice President, Product Management, Scania Trucks. "A great deal of care has gone into things like aerodynamics and smart engine management. Compared to today's Scania Streamline, our extremely efficient long-haul trucks with Euro 6 engines, the reduction is – all else being equal – in the region of 5%. For a typical long-haul truck that covers 150,000 km a year, this means a reduction of just over 2000 litres of diesel and considerably lower fuel costs."

Lay shaft brake cuts time

Other big news is that Scania is introducing a lay shaft brake system as standard in the automated Scania Opticruise gearboxes. Instead of using synchro rings to synchronise the different speeds of the countershaft and main shaft in the gearbox during gearshifts, as in most conventional gearboxes, Scania uses a lay shaft brake when upshifting. This is possible thanks to Scania's approach with fully integrated powertrains and means that the shafts synchronise with each other significantly faster and that the next pinion – that is to say the next gear – can engage almost immediately.

"This technique is hassle-free, and it makes a big difference when it comes to driving experience and performance," says Magnus Mackaldener, Head of Transmission Development. "Thanks to the lay shaft brake, our most popular gearbox for long-haul trucks, the GRS905, shifts up a gear in 0.4 seconds, which means that gearshift time has been almost halved. It is so fast in practice that it renders other types of complicated, energy-consuming and heavy gearshift time-cutting solutions superfluous."

Using a lay shaft brake instead of conventional synchromesh not only shortens the actual gearshift time, it also means that turbo pressure can be better maintained. Therefore, the vehicle will upshift to the next gear with greater power, despite the gearshift feeling smoother than before. This feature will lead to both better handling when driving in tough conditions, and better performance in all types of road driving, including starting torque at take-off.



Having the lowest possible fuel consumption is not only important to the haulage firm's economy, it also contributes to its sustainability goals by lowering CO₂ emissions from road transports.

Even Scania's Adaptive Cruise Control System has been given an overhaul; the system can now handle speeds all the way down to standstill. This is naturally a significant help for drivers sitting in queues.

Sustainable solutions

"Ever since Euro 6 was enforced, Scania has been offering the widest range of engines of all manufacturers in Europe," says Björn Westman, Head of Engine Development at Scania. "In addition to a generous range of conventional, highly fuel-efficient diesels, Scania also has the broadest range of engines for alternative fuels such as biodiesel, FAME and RME, natural gas or biogas, ED95 and biodiesel HVO in the current generation of trucks."



Scania has the widest range of engines for alternative and renewable fuels in the truck industry. All Scania trucks in the Euro 5 and 6 range, irrespective of generation, can without problem run on up to 100 per cent HVO. In the best-case scenario this can give a CO₂ reduction of 90 per cent compared with diesel.

"We will gradually be releasing more engines for alternative fuels in the new truck range, with the exception of HVO which can be used in all our Euro 6 engines, regardless of truck range. This means that all types of customer will, in the near future, be able to get a powertrain that also includes alternative fuels in the new generation," explains Björn Westman, Head of Engine Development at Scania.

"Our goal is for all customers, whatever their type of assignment, to be able to have a sustainable and customised comprehensive solution which includes services that match their specific needs. At Scania, we should

always be able to assist them regardless of whether their focus is on achieving the market's lowest consumption or reaching highly ambitious CO₂ targets”, says Björn Westman.

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The following Scania Euro 6 engines are available in Scania’s new truck range from the start, with more versions to follow:

	<i>Engine type</i>	<i>Max. power at r/min</i>	<i>Max. torque at r/min</i>
13-litre 370 hp 410 hp 450 hp 500 hp	Released later DC13 141 410 DC13 148 450 DC13 155 500	302 kW (410 hp) at 1,900 r/min 331 kW (450 hp) at 1,900 r/min 373 kW (500 hp) at 1,900 r/min	2,150 Nm at 1,000-1,300 r/min 2,350 Nm at 1,000-1,300 r/min 2,550 Nm at 1,000-1,300 r/min
16-litre 520 hp 580 hp 730 hp	DC16 105 520 DC16 106 580 DC16 107 730	382 kW (520 hp) at 1,900 r/min 427 kW (580 hp) at 1,900 r/min 537 kW (730 hp) at 1,900 r/min	2,700 Nm at 1,000-1,300 r/min 2,950 Nm at 1,000-1,350 r/min 3,500 Nm at 1,000-1,400 r/min

TECHNICAL ENGINE DATA

Euro 6 – base engine facts

	13 litres diesel SCR	16 litres diesel EGR + SCR
Principle	Charge cooled	Charge cooled
Swept volume	12.7 litres	16.4 litres
Firing order	1-5-3-6-2-4	1-5-4-2-6-3-7-8
Cylinders	Inline six	90° V8
Cylinder heads	6	8
Valves per cylinder	4	4
Bore x stroke	130x160 mm	130x154 mm
Compression ratio	20:1	17.4:1
Fuel injection	Scania XPI	Scania XPI
Emission control	Scania FGT, DOC, DPF, SCR	Scania EGR, VGT, DOC, DPF, SCR
Max. exhaust braking at r/min	256 kW 2400	320 kW 2400
Oil capacity	43 litres	43 litres