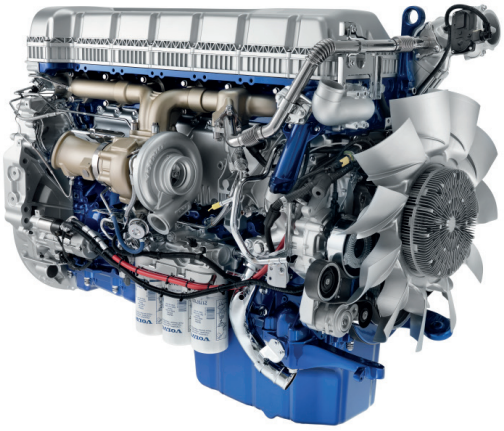
FACT SHEET

Engine D13K540, EU6SCR





The D13K540 is a 540 hp, 12.8-litre, in-line, six-cylinder diesel engine equipped with an overhead camshaft, four valves per cylinder and common rail fuel injection. The engine meets the Euro 6 exhaust emissions requirements.

The D13K540 is designed for heavy long-haul and distribution operations. It is based on a robust and dependable design with an overhead camshaft, four valves per cylinder and precisely controlled electronic fuel injection.

The timing mechanism is located at the rear of the engine, which results in less vibration and permits the fitting of a rear-mounted power take-off.

The D13K540 is a low-emission engine in terms of both exhaust gases and noise. Euro 6 legislation reduces nitrogen oxide (NO_x) by 80% and particulate emissions by 50% compared with Euro 5. In order to meet legislative requirements, Volvo Trucks has developed an after-treatment system that, in the silencer, combines a Diesel Oxidation Catalyst (DOC), a Diesel Particulate Filter (DPF), a Selective Catalytic Reduction unit (SCR) and an Ammonia Slip Catalyst (ASC).

The Euro 6 engine is based on the reliable Euro 5 engine. It features an uncooled EGR circuit that in combination with diesel injection into the exhaust increases the exhaust temperature when needed in cold driving cycles.

Volvo´s engines together with the emission after treatment system are highly efficient and are exceeding the legal requirements referred to as Euro 6 Step C version.

The D13K can be equipped with VEB+ (Volvo Engine Brake) and EPG (Exhaust Pressure Governor). These systems provides extremely high braking effect, further improving safety and reducing wear on the wheel brakes.

FEATURES AND BENEFITS

- Maximum torque within a broad rev range.
- Fuel efficient.
- Low-emission variant, Euro 6.
- Extremely high engine braking effect with VEB+ and EPG (option).
- Rear-mounted power take-off with high power output (option).

Efficient combustion for excellent driveability

The D13K is equipped with common rail fuel injection that provide high injection pressure. The combustion chamber and inlet manifold are designed for optimum combustion. The gas-fill ratio is extremely high, which contributes to the high efficiency.

The design creates a fuel-efficient engine with high power and immense torque within a broad rev range. This gives the D13K excellent driveability.

The torque curve of the D13K engine is improved compared to Euro 5, providing higher torque at even lower revs.

Fulfilling the Euro 6 standard

The additional components in the after-treatment system serve two main purposes: to improve gas flow and make sure the exhaust gases reach the after-treatment system at optimum temperature, thus ensuring that the emission level is not exceeded.

The Diesel Oxidation Catalyst (DOC) produces the nitrogen dioxide (NO_2) necessary for the Diesel Particulate Filter (DPF) to efficiently combust the particulates. In cold conditions, it also provides the heat needed for regeneration.

The Diesel Particulate Filter (DPF) collects particulate matter (PM) until it is automatically burned off during regeneration.

In the mixing zone in the Selective Catalytic Reduction unit (SCR), the exhaust gases are sprayed with AdBlue. When they reach the catalyst, the nitrogen oxides (NO_x) are efficiently transformed into harmless nitrogen gas and water.

The Ammonia Slip Catalyst (ASC) is the last step before the tailpipe where any remaining ammonia (NH_3) is removed.

Hydrocarbon injection into the exhaust pipe is used for heat management of the aftertreatment system. The diesel is combusted in the DOC, heating it, which ensures the efficiency of the DPF and good SCR functionality.

Low noise emission at idling

The D13K meets the relevant noise emission requirements. The crankshaft and camshaft feature hydraulic vibration dampers that minimise noise and vibrations. Pre-injection of fuel is used to further dampen noise at idling.

Crankcase ventilation

The D13K offers a choice of two types of closed crankcase ventilation. CCV-C is recommended down to -25 degrees Celsius. CCV-OX is only recommended for arctic markets.

Both system promotes an extremely clean and environmentally compatible engine.

Timing and power take-off at the rear

The engine timing mechanism is located at the rear and drives the power steering pump, oil pump, fuel feed pump and air compressor. It is a compact, quiet and thoroughly sealed design that saves weight. With the timing mechanism at the rear, the engine's cooling is also improved since the flow of incoming cooling air is not obstructed.

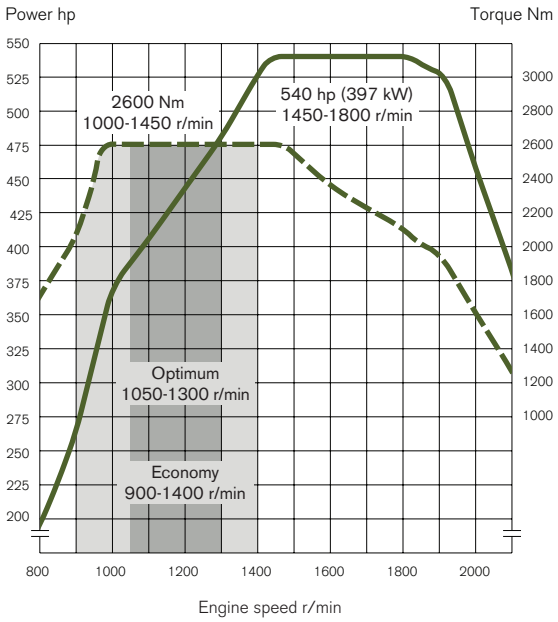
The D13K can be equipped with a power take-off designed for propshaft operation or direct-mounted hydraulic pumps (also clutchable). PTO mounting on the engine's flywheel results in a dependable design and permits high torque levels, up to 1,000 Nm in continuous operation.

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SPECIFICATION

Type designation	D13K540, EU6SCR
Max power output at 1450–1800 r/min	540 hp (397 kW)
Max revs	2100 r/min
Max torque at 1000–1450 r/min	2600 Nm
No. of cylinders	6
Bore	131 mm
Stroke	158 mm
Displacement	12.8 dm3
Compression ratio	17.0:1
Exhaust brake effect (EPG) at 2300 r/min	200 kW
Engine braking effect (VEB+) at 2300 r/min	375 kW
Economy revs range	900–1400 r/min
Optimum rev range	1050–1300 r/min
Oil-change volume incl. oil filter	approx. 33 l
Oil filters	2 full-flow, 1 bypass
Cooling system, total volume	approx. 38 l
Dry weight (base engine)	approx. 1100 kg
Exhaust after treatment system, weight	approx. 130 kg



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