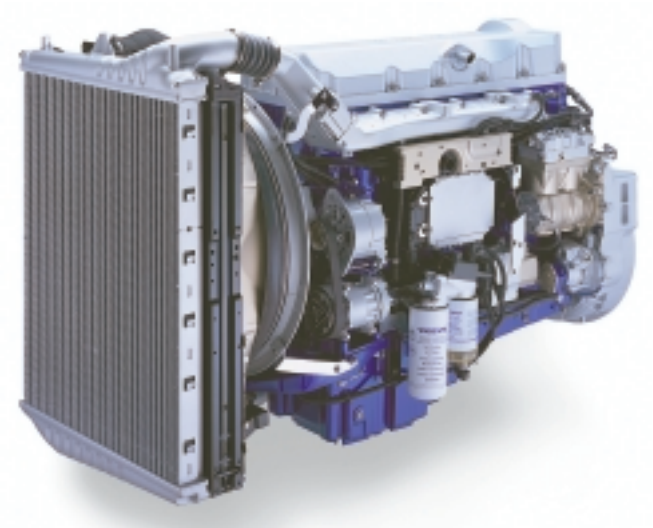
Fact Sheet

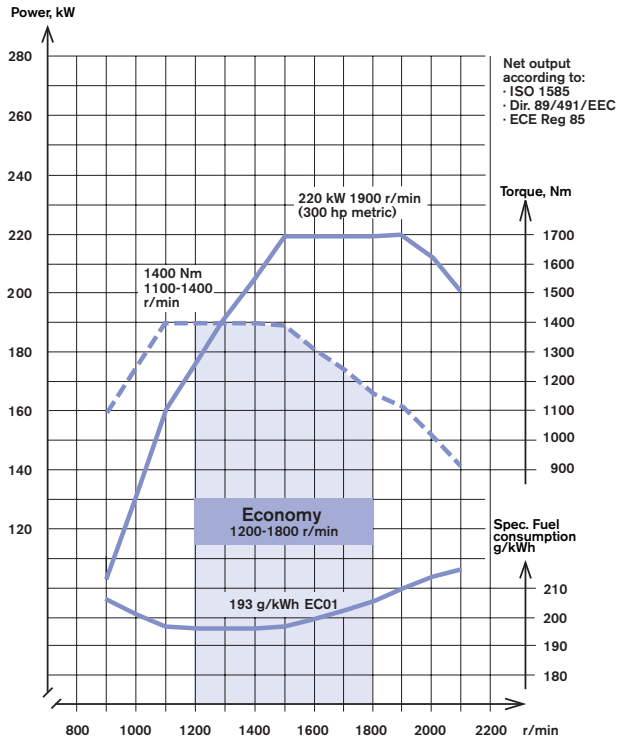
Engine
D9A300, EM-EC01

The D9A300 is a straight, six-cylinder, 9.4 litre 300 hp metric diesel engine with a turbo compressor and intercooler. The engine meets EU regulations regarding exhaust and noise emissions according to Euro 3.



The D9300 is based on the same fundamental concept as the larger D12D engine and has an overhead camshaft, four valves per cylinder, unit injectors and fitted cylinder head. The design has a very low weight.
The engine functions are controlled completely electronically by Volvo's EMS (Engine Management System), which contributes to low fuel consumption and low exhaust emissions. The system also provides advanced capabilities for diagnostics and troubleshooting.
The highly efficient combustion is achieved by the high charge pressure from the turbo compressor combined with precision-controlled injection.
The transmission is on the flywheel side of the engine, giving the engine a compact installation and allowing a rear power take-off to be installed.
The D9A300 generates high torque at low engine speeds, resulting in very good lugging capability. This, combined with a wide engine speed range, gives the engine very good drivability. The D9A300 is characterised by the following features:

- Electronic engine management (EMS) with precise fuel injection results in low fuel consumption and low emission values.
- Electronically controlled fuel injection with centrally located vertical unit injectors.
- Electronic oil level transmitters which provide readings on the driver information display.
- Maximum torque in a wide range of engine speeds provides good driving characteristics and low fuel consumption.
- High engine braking power with VEB*.
- Engine rear power take-off for directly running a hydraulic pump or flange.



Specification

Type designation	D9A300, EM-EC01
Max. power at 1900 rpm	220 kW (300 hp)
Max. rpm	2100 rpm
Max. torque at 1100-1400 rpm	1400 Nm
No. of cylinders	6
Bore	120 mm
Stroke	138 mm
Displacement	9.4 dm^3
Compression ratio	18.5:1
Exhaust brake output at 2400 rpm	140 kW
Engine brake output (VEB)* at 2400 rpm	264 kW
Economy rpm	1200-1800 rpm
Engine oil capacity, including filters	26 l
No. of oil filters	2 full-flow, 1 bypass
Cooling system, total volume	36 l
Weight	865 kg

*VEB (Volvo Engine Brake) is available as a variant.

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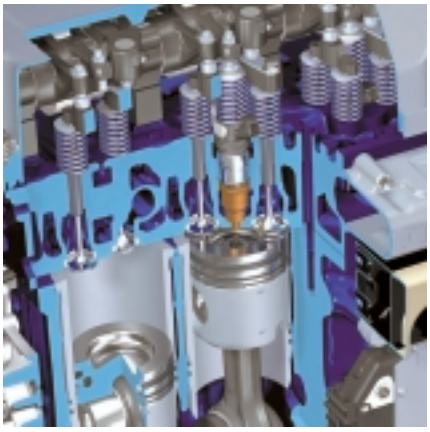
Four-valve engineering and overhead camshaft

The D9A has four valves per cylinder and separate inlet and exhaust ports with transverse flow. This results in rapid gas exchange. The combustion chamber is designed to provide an optimum combustion process.
The design of the inlet port and the location of the valves in the cylinder head minimise the rotational velocity of the inlet air, so that the pressure drop is small. The degree of gas filling becomes high, contributing to high efficiency.



Symmetrical injection results in more efficient combustion

The D9A is equipped with unit injectors, which allow high injection pressures.
The high pressure is created mechanically via a rolling rocker arm, which is driven by the overhead camshaft. The profile of the injection cam is matched to the injector to provide sufficient lift.
The cylinder head has only one common fuel channel to the injectors and inlet ports, and valves are of large diameter to give a low loss of pressure.
This design solution results in precise injection and low fuel consumption with high output and low emissions.

Electronic engine control integrated in the vehicle's electronic system

The D9A engine is equipped with Volvo EMS (Engine Management System), which means that the engine's functions are controlled completely electronically. EMS provides efficient engine control and advanced capabilities for diagnostics and troubleshooting.
The engine control unit is connected to the vehicle electronic system's data links, and the information is presented on an easy-to-read display on the dashboard.

Transmission with compact installation

The transmission is located at the rear of the engine. The transmission drives the steering servo pump, fuel pump, camshaft and air compressor. The cooling pump, fan, generator and AC compressor are located at the front of the engine and driven by multi-groove, Poly-V belts.
This design solution makes it possible to locate a power take-off at the rear of the engine. The location of the transmission additionally results in a compact installation.

VEB – reliable engine braking with high power

The D9A can be equipped with a steplessly variable Volvo Engine Brake (VEB), which is a compression engine brake. The design is a Volvo patent which makes maximum use of the engine's compression stroke to produce high braking power.
VEB can be used together with the cruise control to maintain high average speed with good operating economy.
VEB reduces wear on the ordinary wheel brakes. In addition, the system has low weight in comparison with other supplementary brakes.

Power take-off with high capacity

The Volvo D9A can be equipped with an engine-driven, clutch-independent power take-off to operate a directly mounted hydraulic pump or flange. The power take-off can transfer up to 1000 Nm in continuous operation. It is located at the rear of the engine together with the transmission. The power take-off is designed for high torque take-offs with high reliability.

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