

# 909. The engine for construction equipment.

5.8 - 11 kW at 1500 - 3000 rpm



## These are the characteristics of the 909:

Air-cooled single-cylinder engine.

0.7 litre displacement.

Advanced direct fuel injection and combustion system, in conformity with exhaust emission standard Level II (EU-RL 97/68).

Maximum torque 38.2 Nm at 2,000 rpm.

Stiff grey-cast crankcase, with additional acoustic optimisation.

Easy access for all adjustment and service work.

Flexibility through various starting options:

- manual starting using hand crank • electric starter motor
- manual and electric starting.

## Your benefits:

- ▶ High torque at low speeds and 90 % of maximum torque across a wide speed range give you great elasticity in the use of your equipment.
- ▶ Extremely long service life thanks to heavy-duty designs.
- ▶ Low exhaust emission values ensure environmentally friendly operation. A special version of the engines is available on request to meet strict US exhaust emission regulations (EPA).
- ▶ High degree of reliability and long service life even in extreme operating conditions.
- ▶ Broad power range from 1,500 to 3,000 rpm ensures the operating point and speed range you are looking for are always available.
- ▶ Excellent rugged design places minimum demands on your operating personnel.



## ► Engine description

<b>Cooling system:</b>	Air-cooled with integrated radial-flow blower. Cooling air enters via side openings in the crankcase.
<b>Crankcase:</b>	Grey cast iron, acoustically optimised through internal design.
<b>Crankcase ventilation:</b>	Closed crankcase ventilation system.
<b>Cylinder head:</b>	“Cross-flow” light alloy cylinder head.
<b>Cylinder:</b>	Wear-resistant grey cast alloy with generously dimensioned cooling fins, ensures efficient cooling of cylinder and piston.
<b>Valve arrangement/ timing:</b>	Overhead valves in the cylinder head, one inlet and one exhaust valve, actuated from gear-driven camshaft via tappets, push rods and rocker arms.
<b>Piston:</b>	Three-ring piston: two compression rings and one oil scraper ring.
<b>Piston cooling:</b>	Oil spray via nozzle.
<b>Crankshaft:</b>	Drop-forged steel crankshaft.
<b>Connecting rod:</b>	Drop-forged steel rod, diagonally split.
<b>Main and big end bearings:</b>	Ready-to-install tri-metal plain bearings.
<b>Main bearing on flywheel side:</b>	Roller bearings for reduction of friction losses.
<b>Camshaft:</b>	Forged steel, induction hardened. Enables manual starting and PTO at half-speed.
<b>Balancing of masses:</b>	Forged offset balancing of masses, mounted on the oil pump drive shaft.
<b>Lubrication system:</b>	Forced-feed circulation lubrication with rotary pump. External pressure regulating valve for easy cleaning of valve, if necessary.
<b>Lube oil filter:</b>	Paper-type micro-filter as replaceable-cartridge full flow filter.
<b>Fuel system:</b>	14.5 litres fuel tank. Automatic breathing of the fuel injection system.
<b>Injection pump/ governor:</b>	Mountable pump in crankcase with mechanical centrifugal governor.
<b>Injection nozzle:</b>	Advanced 5-hole nozzle.
<b>Fuel filter:</b>	External, easy-access replaceable cartridge.
<b>Air filter:</b>	Dry-type air filter with easy-access arrangement in fuel tank. A conventional dry-type air filter can be supplied separately on request.
<b>Starter motor:</b>	12 V; 1.4 kW.
<b>Alternator:</b>	Three-phase alternator (flywheel alternator) 14 V; 23 A.
<b>Options:</b>	Flywheels for various applications, fine adjustment for two speed points, speed adjustment for vehicle application, various engine monitoring systems (panel) in 12 V version, 12 V electro-magnetic switch (release switch), industrial couplings, various V-belt options for PTO, hydraulic pumps with various capacities, irrigation pumps (centrifugal) in low, medium and high-pressure versions.

## ► Technical data

Engine type		D 909 L 1
Number of cylinders		1
Bore/Stroke	mm	95/100
Displacement	l	0.7
Compression ratio		17
Max. rated speed	rpm	3000
Mean piston speed	m/s	10.0

### Power ratings for construction equipment engines

Power ratings for automotive <sup>1)</sup> and industrial engines		
	kW	11
at speed	rpm	3000
Mean effective pressure	bar	6.21

Power ratings for industrial engines <sup>2)</sup> highly intermittent operation		
	kW	11
at speed	rpm	3000
Mean effective pressure	bar	6.21

Intermittent operation	kW	10.5
at speed	rpm	3000
Mean effective pressure	bar	5.93

Max. torque	Nm	38.2
at speed	rpm	2000

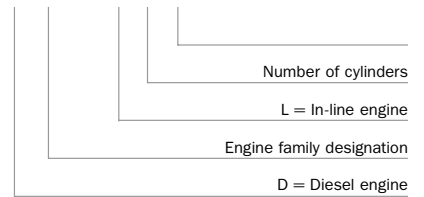
Minimum idle speed	rpm	850
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Specific fuel consumption <sup>3)</sup>	g/kWh	236
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Weight to DIN 70020, part 7A <sup>4)</sup>	kg	106
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## ► Model designation

### D 909 L 1



1) Power ratings to ISO 1585 and European guidelines 80/1269/CEE and 88/195/CEE.

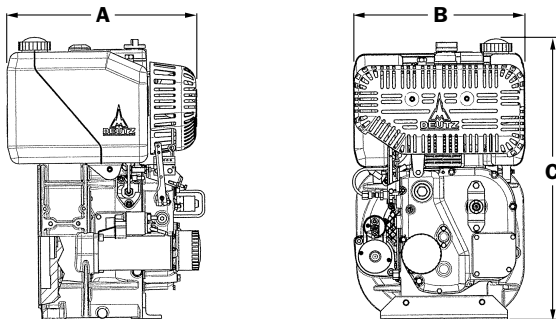
2) Power ratings to ISO 3046/1 for industrial engines.

3) Specific fuel consumption based on diesel fuel to DIN 51601 with a specific gravity of 0.835 kg/dm<sup>3</sup> at 15°C.

4) Without starter motor/alternator, without liquids, but with standard flywheel.

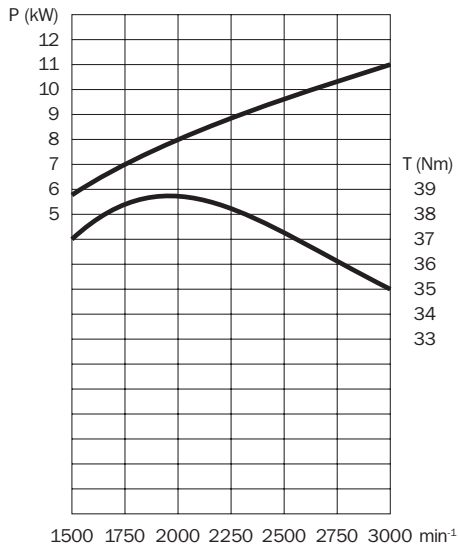
The values given in this datasheet are for information purposes only and are not binding. The information given in the offer is decisive.

## ► Dimensions



Engine		A	B	C
D 909 L 1	mm	453	400	665

## ► Standard engine



► **D 909 L 1**



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