TCD 2.9

Engine for Industrial Applications

28 - 55.9 kW | 38 - 75 hp at 2600 min^{-1} | rpm

EU Stage III B / US EPA Tier 4 interim

The engine company.

DEUTZ®

Characteristics

4 cylinder in-line engines turbocharged, with or without charge air cooler | Water-cooled | Compact engine design | Advanced fuel injection and combustion system | External cooled exhaust gas recirculation | Full line customized options | Excellent cold starting ability for extreme climatic conditions | Full power at flywheel end for axial or radial drives | Optional side PTO from gear end cover | In compliance to non-road emission standards EU Stage III B and US EPA Tier 4 interim

Your Benefits

- Compact 4 cylinder engine with high specific power and torque, a market leader in engine performance, specially designed for short and narrow machine installations.
- The modern common rail fuel injection system, the rear gear drive and optional balancer shafts guarantee low noise, low vibration and smooth engine operation under all load conditions.
- Engine variant, without aftertreatment but with otherwise identical installations parameters, providing flexibility for export markets with lower emission requirements.
- Low fuel consumption via high pressure Common Rail system, 500 hr oil change interval and the maintenance free valve train provide durable productivity and life long low operating cost.
- Low fuel consumption, recyclable components and fluid change friendly systems, designed to protect the environment.
- An exhaust aftertreatment system tailored to meet all the requirements of Industrial Equipment and offer the opportunity of compact installation through the flexibility of loose or engine mounted options.
  The DVERT® 'wall flow' high efficiency system with active regeneration is suitable for all equipment applications with a minimum ash servicing period of 3000 hours.
  The DVERT® 'through flow' system offers the eligible feature of service free operation throughout the engine design life.
  Our modular design provides the benefits of competitive cost and robust compliant solutions for all applications, duty cycles and markets.
- The extensive network of DEUTZ distributors and dealers providing excellent technical back up and enviable global brand presence.

Engine Specifications

Cylinder:	4 cylinder in-line
Cooling system:	Water-cooled, belt driven water pump with integrated, thermostat controlled bypass
Crankcase:	Ribbed, thin-wall grey cast iron, noise-optimised
Crankcase breather:	Closed-circuit system
Cylinder head:	Grey-cast iron, U-flow design, 2 valves per cylinder
Valve train:	Overhead valves in cylinder head, two valve per cylinder, actuated via rocker arms, push rods and hydraulic tappets, driven by low-noise straight cut gears and camshaft.
Charging:	Wastegate turbo charger and air-to-air charge cooling version
Piston:	3-ring piston with oil jet cooling
Connecting rod:	Drop-forged steel rod, fracture split
Crankshaft:	High grade SG iron, fillet-rolled, casted counterweights, tri-metal shell bearings
Camshaft:	Steel
Lubrication system:	Gear driven oil rotor pump, integrated oil cooler with spin-on cartridge filter
Fuel injection system:	High pressure Common Rail, electronically controlled
Fuel filter:	Replaceable cartridge main filter and a pre-filter with water trap
Fuel lift pump:	Electrical pump
Alternator:	Three-phase alternator, 14 V / 55 - 120 A (depending on application)
Starter motor:	12 V / 2.6 kW
Options:	Intake manifold connections, exhaust manifolds connections, hydraulic pumps drives, mass balancing shafts, engine mounts, multi oil pan drains, dipsticks, SAE flywheel housings, flywheels, oil filter position horizontal, vertical and remote, oil filler in cylinder head cover and low level fill on side of crankcase, electrics 12 V and 24 V

Technical Data

Engine model		D 2.9 L4	TD/TCD 2.9 L4
Number of cylinders		4	4
Bore/stroke	mm | in	92/110 | 3.6/4.3	92/110 | 3.6/4.3
Displacement	l | cu in	2.92 | 178	2.92 | 178
Compression ratio		1 : 19.2	1 : 17
Rated speed	min^{-1} | rpm	2600	2600
Mean piston speed	m/s | ft-m	11.0 | 2165	9.5 | 1877

EU Stage III B / US EPA Tier 4

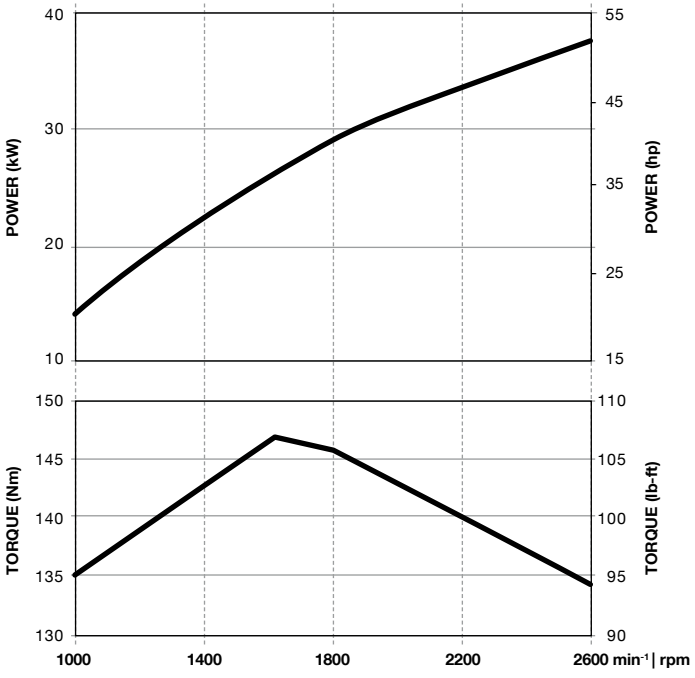
Power ratings[1)]		D 2.9 L4	TD/TCD 2.9 L4
Power acc. to ISO 14396	kW | hp	36.9 (36.4[3)]) | 50	55.9 (55.4[3)]) | 75
at engine speed	min^{-1} | rpm	2600	2600
mean effective pressure	bar | psi	5.1 | 186	8.8 | 128
Max. torque	Nm | ft-lb	147 | 108	255 | 188
at engine speed	min^{-1} | rpm	1600	1800
Minimum idle speed	min^{-1} | rpm	900	900
Weight acc. to DIN 70020, Part 7A[2)]	kg | lbs	210[2)] | 463[2)]	225[2)] | 496[2)]

1) Power ratings at flywheel gross, without cooling system
2) Not including starter motor/alternator, radiator and operating fluids but including flywheel and flywheel housing.
3) Power rating for US EPA Tier 4

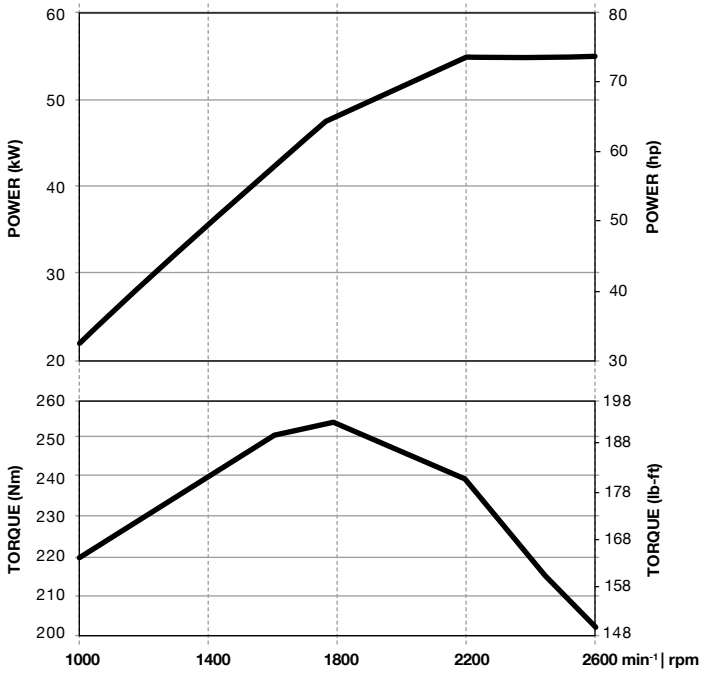
The figures indicated in this datasheet are for informational purposes only and are not binding.
The specifications in the quote are determinative.

Standard Engines

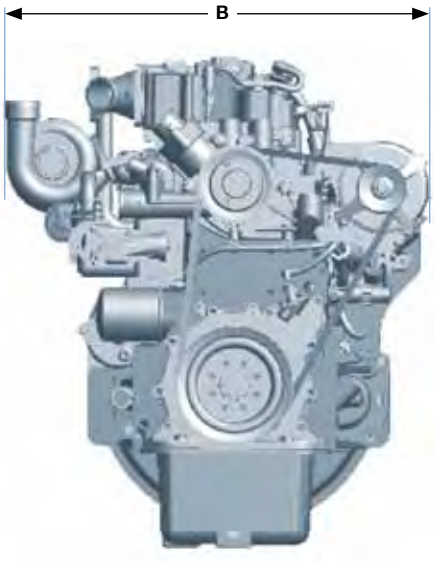
D 2.9 L4 **2600 min^{-1} | rpm**

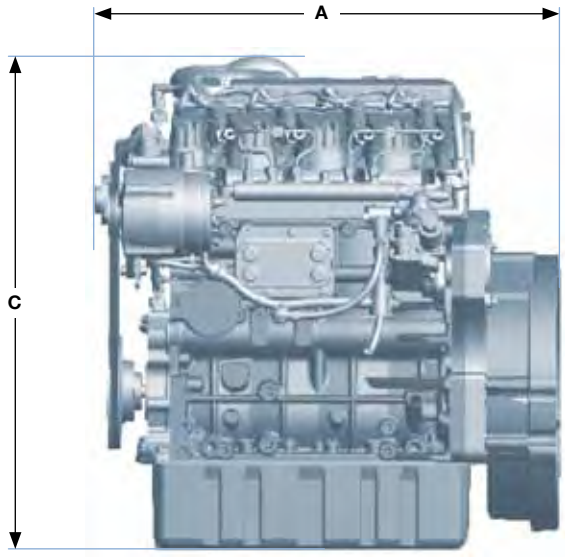


TD/TCD 2.9 L4 **2600 min^{-1} | rpm**



Dimensions		A	B	C
D 2.9 L4	mm | in	652 | 25.7	477 | 18.8	695 | 27.4
TD/TCD 2.9 L4	mm | in	652 | 25.7	552 | 21.7	695 | 27.4





Dimensions			D	L	DVERT® Systems		
					DOC only	‚Through Flow'	‚Wall Flow'
D 2.9	< 37 kW	mm | in	190 | 7.5	400 | 15.7	■		
TD 2.9	< 56 kW	mm | in	190 | 7.5	590 | 23.2		■	■
TCD 2.9	< 56 kW	mm | in	190 | 7.5	600 | 23.6	■		■

DVERT® ‚through flow' system is not suitable for some specific market legislations.
For more information please contact DEUTZ AG, Cologne, or responsible regional sales organisation.
All connection variants are available in either 0° or 90° positions of both intake and outlet flanges.

These illustrative pictures showing the scale of EAT systems vs engine are for information purposes only and not binding.
The final design will be published via DEUTZ technical documentation systems.

Tier 4 – **our driving force**, your advantage.

Starting January 2013, diesel engines of mobile construction machines with power classes ranging < 56 kW have to meet European regulations on exhaust emissions according to EU Stage III B or US EPA Tier 4. The considerable reduction in particulate matter and NO_X requires that engines be equipped with additional exhaust emission treatment equipment.

The individual solution counts
Our goal as engine specialists is to provide our customers with engines that not only meet all of their performance needs but also comply with the various emission regulations worldwide while meeting their demands for efficient and economical engine operation. We are therefore developing solutions oriented to meet individual customer requirements.
The modular DVERT® system developed by DEUTZ enables us to implement different emission-reducing technologies specifically tailored to fulfil those requirements while maintaining the performance of our engines, which include high fuel economy, dependability, and long life.
The DVERT® Oxidation Catalyst (DOC) only or combined with an open DVERT® ‚through flow' module is one of the technologies we implement for the 2.9 engine series complying with the EU exhaust emission Stage III B and the US EPA Tier 4 for many applications.
For more challenging applications and load profiles DEUTZ also offers the possibility to use a DOC and closed DVERT® ‚wall flow' system with throttle regeneration.

Operation mode and Regeneration of the Diesel Particulate Filter
The DVERT® Oxidation Catalyst (DOC) initially oxidizes gaseous pollutants such as HC, CO, and NO.
Soot particulates are then captured in an enclosed DVERT® particulate system installed after the catalyst. The DVERT® Particulate module (through or wall flow) via a temperature dependant continuous catalytic reaction burns off the deposits. In these types of system regeneration is possible for virtually all load patterns and represents by far the most cost-effective solution.
In addition the wall flow system offers active regeneration by means of an electronically controlled intake air throttle to achieve the required temperature level for the regeneration in the case of low exhaust temperatures.

DEUTZ worldwide:

www.deutz.com

DEUTZ AG
Ottostr. 1
51149 Cologne, Germany
Phone: +49 (0) 221 822-0
Telefax: +49 (0) 221 822-3525
E-Mail: info@deutz.com
www.deutz.com

DEUTZ Corporation
3883 Steve Reynolds Blvd.
Norcross, GA 30093, USA
Phone: +1 770 564 7100
Telefax: +1 770 564 7222
E-Mail: engines@deutzusa.com
www.deutzusa.com

DEUTZ AG Beijing Office
207 CITIC Building
Jian Guo Men Wai Dajie,
100004 Beijing, P.R. China
Phone: +86 10 65 00 64 44
Telefax: +86 10 65 12 00 42
E-Mail: dbj@deutz.com.cn
www.deutz.com.cn

DEUTZ Asia-Pacific (Pte) Ltd.
11 Kian Teck Road
628768 Singapore
Phone: +65 62 68 53 11
Telefax: +65 62 64 17 79
E-Mail: dap@deutz.com
www.deutz.com

DEUTZ Australia Pty. Ltd.
41 Woodlands Drive
3195 Braeside Vic, Australia
Phone: +61 3 9586 9600
Telefax: +61 3 9580 4090
E-Mail: deutzoz@deutz.com
www.deutz.com

Bestell-Nr. 0031 2262 / 02 / 2011 / VC-CM

The engine company.

DEUTZ®