



# TCD 2013

**Engine For Agricultural Equipment**

**172–261 kW | 214–355 hp at 2200 min<sup>-1</sup> | rpm**

**EU Stage III B / US EPA Tier 4 interim**

The engine company.



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

Starting January 2011, diesel engines of mobile construction machines with power classes ranging from 130 to < 560 kW must meet European regulations on exhaust emissions according to EU Stage III B and US EPA Tier 4 interim. These emission standards will require considerable reductions in particulate matter and NO<sub>x</sub> emissions.

Accordingly, our engines will be receiving additional exhaust emission treatment equipment that is adapted to the respective combustion principle.

### The individual solution counts

Our goal as engine specialists is to provide our customers with engines that not only meet all of their power needs but also comply with the various emission regulations worldwide while meeting their demands for efficient and economical engine operation to the greatest possible extent.

The modular DVERT® system developed by DEUTZ enables us to implement different emission-reducing techniques specifically tailored to fulfill individual customer requirements while maintaining the proverbial criteria of our engines, which include high economy, dependability, and long life.

Selective catalytic reduction (SCR) is one of the standard DVERT® modules we use to highly efficiently reduce the NO<sub>x</sub> emissions of our 2013-series engines, beginning with exhaust emission stages III B and EPA Tier 4 interim.

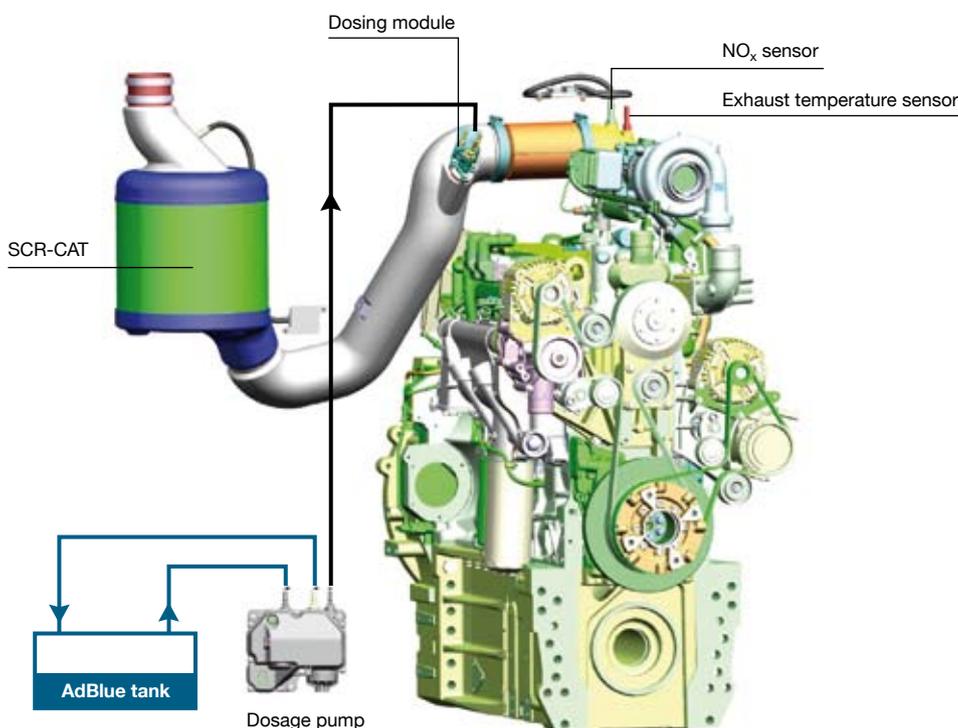
This method does not directly use the ammonia necessary for the selective catalytic reaction but instead injects it as a 35% water-based urea solution into the engine exhaust where the chemical reaction produces ammonia (NH<sub>3</sub>) and carbon dioxide (CO<sub>2</sub>). At the corresponding temperature, the ammonia formed in the SCR catalytic converter reacts with and reduces the nitrogen oxide (NO<sub>x</sub>) in the exhaust. The amount of urea solution injected by a special injection nozzle depends on the amount of nitrogen oxide currently present at the engine operating point and thus the respective load and rpm. The urea consumption thus depends on the collective engine load and can range between 2% and 5% of the engine fuel consumption.

### Higher performance and dynamics – lower fuel consumption

The customer benefits from using the SCR method in the 2013-series in that fuel and lubricating oil consumption remains at known low levels for his machines and no extra expense incurs for engine cooling. The SCR process, in conjunction with optimized injection and combustion technology, makes it possible to reduce particulate emission limits solely with the help of engine modifications.

### DVERT® – solutions for the future

Only after exhaust emission stage EU IV / US EPA Tier 4 takes effect, will it be necessary to equip engines of this model series with combined particulate filter and DeNO<sub>x</sub> technology.



# Characteristics

Modern, liquid-cooled 6-cylinder in-line engine | Turbocharged with intercooler (air/air) | High-performance, rugged engine with a high power density | Power take-off capabilities integrated in the gear train | Electronic engine control with intelligent adaptation to drive management | High-pressure fuel injection with DEUTZ's Common Rail System (DCR®) | SCR Exhaust aftertreatment

## Your Benefits

- Highly economical due to very good fuel economy, simple and cost-effective installation, and long service intervals.
- Low noise emissions eliminate the need for costly additional sound insulation.
- Slender engine design and variable layout of the front end of the engine offer maximum flexibility.
- With the DVERT® platform, the 2013 is prepared for future EU Stage IV and US EPA Tier 4 exhaust emission stages.
- The compelling performance of the smooth running engine guarantees great driving comfort.
- The 2013 complies with emissions controls for mobile machinery in accordance with EU Nonroad 2004/26/EU Stage III B and US EPA Tier 4 interim.

## Engine Specifications

<b>Type of cooling:</b>	Liquid cooling
<b>Crankcase/cylinders:</b>	Gray cast iron housing, wet cylinder sleeves
<b>Crankcase ventilation:</b>	Open
<b>Cylinder head:</b>	Modular design, gray cast iron cylinder head
<b>Valve arrangement / control:</b>	Overhead in the cylinder head, two intake and exhaust valves per cylinder, actuated by tappets, pushrods, and rockers. Control is driven by camshaft running in binary bearings
<b>Pistons:</b>	Triple-ring pistons, two compression rings, one oil ring
<b>Piston cooling:</b>	Injected cooling oil
<b>Turbocharging:</b>	Wastegate turbocharger with charge air intercooler (air/air).
<b>Connecting rod:</b>	Drop-forged steel
<b>Crankshaft bearings:</b>	Ternary bearings, one of which thrust bearing
<b>Piston rod bearings:</b>	Quarterternary/ternary friction bearings
<b>Crankshaft:</b>	Drop-forged steel
<b>Camshaft:</b>	Steel, running in binary bearings
<b>Camshaft drive:</b>	By the crankshaft by straight, high-geared spur gears
<b>Lubrication:</b>	Forced-feed lubrication
<b>Lubricating oil cooler:</b>	External
<b>Lubricating oil filter:</b>	Replaceable paper microfilter cartridge in main lubricating oil flow
<b>Injection pump / controller:</b>	Two high-pressure unit pumps
<b>Fuel supply pump:</b>	Gear pump in gear train
<b>Injector:</b>	8-hole injection nozzle
<b>Fuel filter:</b>	Replaceable paper microfilter cartridge
<b>Alternator:</b>	Three-phase alternator 14 V, 150 A (standard)
<b>Starter:</b>	12 V / 4 kW (standard)
<b>Heating system:</b>	Optional connection for cab heating
<b>Options for adapting to specific equipment requirements:</b>	Hydraulic pumps, connection housing, oil pans, fan attachments, air-conditioning compressor, alternators

# Technical Data

Engine model		TCD 2013 L6 4V
Number of cylinders		6
Bore/stroke	mm   in	110/136   4.33/5.35
Displacement	l   cu in	7.75   473
Compression ratio		18,1 : 1
Rated RPM	min <sup>-1</sup>   rpm	2200
Mean piston speed	m/s   ft-m	10.0   1963

## EU Stage III B / US EPA Tier 4 interim

Power ratings for mobile construction machines <sup>1)</sup>		TCD 2013 L6 4V
Power output acc. to ISO 14396	kW   hp	261   350
at engine speed	min <sup>-1</sup>   rpm	2100
Max. power	kW   hp	269   360.7
At speed	min <sup>-1</sup>   rpm	1900   2100
At mean effective pressure	bar   psi	19.23   279
Max. torque	Nm   lb-ft	1498   1105
at engine speed	min <sup>-1</sup>   rpm	1500
Minimum idle speed	min <sup>-1</sup>   rpm	600
Specific fuel consumption <sup>2)</sup>	g/kWh   lb/hp-hr	198   0.33
Weight	kg   lb	1246   2747

1) Power ratings without deducting fan power consumption

2) Best WOT consumption based on diesel fuel with a density of 0.835 kg/dm<sup>3</sup> at 15 °C.

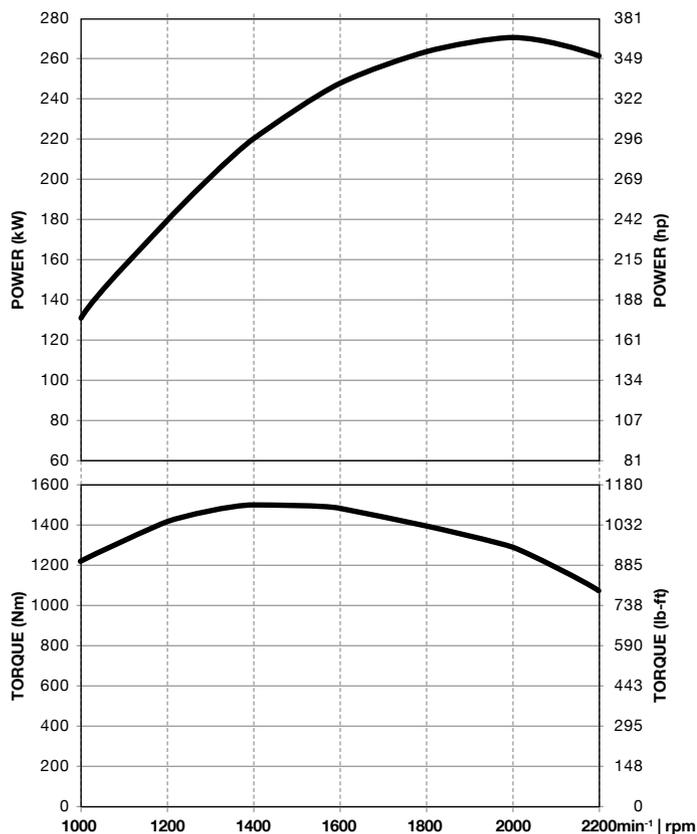
3) Without starter/alternator, cooling system and liquids but with flywheel and flywheel housing

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

## Standard Engine

TCD 2013 L6 4V

2200 min<sup>-1</sup> | rpm



**Dimensions**

TCD 2013 L6 4V

mm | in

**A**

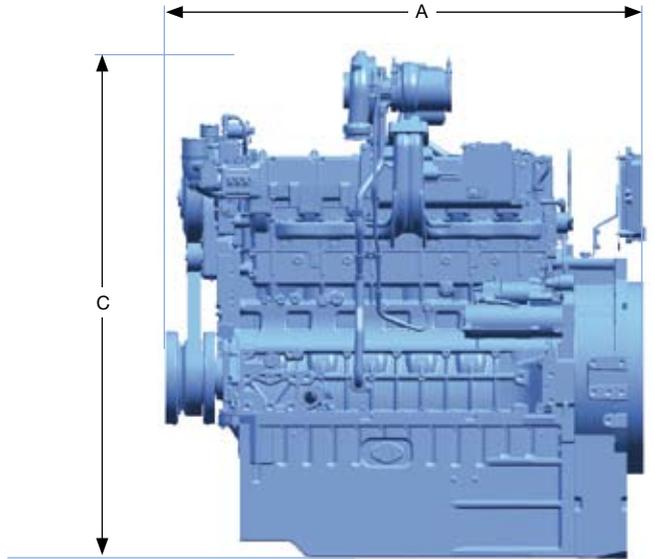
1256 | 49.4

**B**

700 | 27.6

**C**

1355 | 53.3



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