



# TCD 4.1

# TCD 6.1

**Engine for Industrial Applications**

**70-180 kW | 94-241 hp at 2300 to 2400 min<sup>-1</sup> | rpm**

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

The engine company.



# Characteristics

Modern, water-cooled 4 and 6-cylinder in-line engines | Turbocharged with intercooler (air/air), cooled external exhaust gas recirculation and diesel particulate filter | Robust 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 Common Rail System (DCR®) | In compliance to non-road emission standards EU Stage III B and US EPA Tier 4 interim

## Your Benefits

- Excellent economy, based on simple and cost-effective installation, exceptional reliability, long service intervals, and exceptionally low fuel and oil consumption
- Very low noise emissions eliminate the need for costly additional sound insulation.
- Slender engine design and variable layout of the front and rear end of the engine offer maximum flexibility for diverse installation purposes
- Based on the DVERT® platform, the TCD 4.1 / 6.1 are prepared for future EU Stage IV and US EPA Tier 4 exhaust emission stages.
- The optional mass balancing shafts of the smooth running 4-cylinder engine guarantees great driving comfort.
- A modular exhaust aftertreatment system tailored to meet the requirements of construction equipment with respect to compact installation and competitive cost: the closed Diesel particulate filter (DPF) with throttle regeneration respectively diesel burner regeneration
- The extensive network of DEUTZ distributors and dealers providing excellent technical back up and enviable global brand presence.

## Engine Specifications

|  |  |
|--|--|
| Type of cooling:   | Water cooling  |
| Crankcase:   | Grey cast iron with integrated cylinders   |
| Crankcase ventilation:                                   | Open vent system   |
| Cylinder head:   | Modular design, one-piece grey cast iron cylinder head   |
| Valve control:   | Overhead valves in the cylinder head, two intake and exhaust valves per cylinder, actuated by tappets, pushrods, and rockers. Control is driven by camshaft                |
| Pistons:   | 3-ring piston with oil jet cooling   |
| Turbocharging:   | Wastegate turbocharger with charge air intercooler (air/air).  |
| Connecting rod:  | Drop-forged steel  |
| Crankshaft bearings:                                     | Bi-metal shell bearings  |
| Piston rod bearings:                                     | Tri-metal shell bearings   |
| Crankshaft:  | Drop-forged steel  |
| Camshaft:  | Steel driven by high-geared spur gears   |
| Lubrication system:                                      | Forced-feed lubrication, integrated oil cooler with spin-on cartridge filter   |
| Injection system:  | 1600 bar and 2000 bar High pressure Common Rail DEUTZ DCR® system with two high pressure pumps, CR injector with 8 hole injection nozzle and EMR 4 electronic control unit |
| Fuel supply pump:  | Belt-driven gear pump  |
| Fuel filter:   | Replaceable cartridge  |
| Alternator:  | Three-phase alternator 28 V, 100 A (standard)  |
| Starter:   | 24 V / 5,5 kW (standard)   |
| Heating system:  | Optional connection for cab heating  |
| Options for adapting to specific equipment requirements: | 12 V / 24 V electrical system, hydraulic pump drives, connection housing, flywheels, oil pans, fan attachments   |

# Technical Data

| Engine model        |                         | TCD 4.1 L4          | TCD 6.1 L6          |
|---------------------|-------------------------|---------------------|---------------------|
| Number of cylinders |                         | 4                   | 6                   |
| Bore/stroke         | mm   in                 | 101/126   3.98/4.96 | 101/126   3.98/4.96 |
| Displacement        | l   cu in               | 4.04   247          | 6.06   370          |
| Compression ratio   |                         | 18 : 1              | 18 : 1              |
| Max. rated RPM      | min <sup>-1</sup>   rpm | 2400                | 2300                |
| Mean piston speed   | m/s   ft-m              | 10.1   1988         | 9.7   1902          |

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

| Power ratings <sup>1)</sup>                     |                         | TCD 4.1 L4 | TCD 6.1 L6 |
|---|-------------------------|------------|------------|
| Power output acc. to ISO 14396                  | kW   hp                 | 115   154  | 180   241  |
| at engine speed                                 | min <sup>-1</sup>   rpm | 2400       | 2300       |
| At mean effective pressure                      | bar   psi               | 14.2   206 | 15.5   225 |
| Max. torque                                     | Nm   lb-ft              | 609   449  | 1000   738 |
| at engine speed                                 | min <sup>-1</sup>   rpm | 1600       | 1450       |
| Minimum idle speed                              | min <sup>-1</sup>   rpm | 600        | 600        |
| Specific fuel consumption <sup>2)</sup>         | g/kWh   lb/hp-hr        | 215   0.35 | 210   0.34 |
| Weight acc. to DIN 70020, Part 7A <sup>3)</sup> | kg   lb                 | 400   882  | 520   1146 |

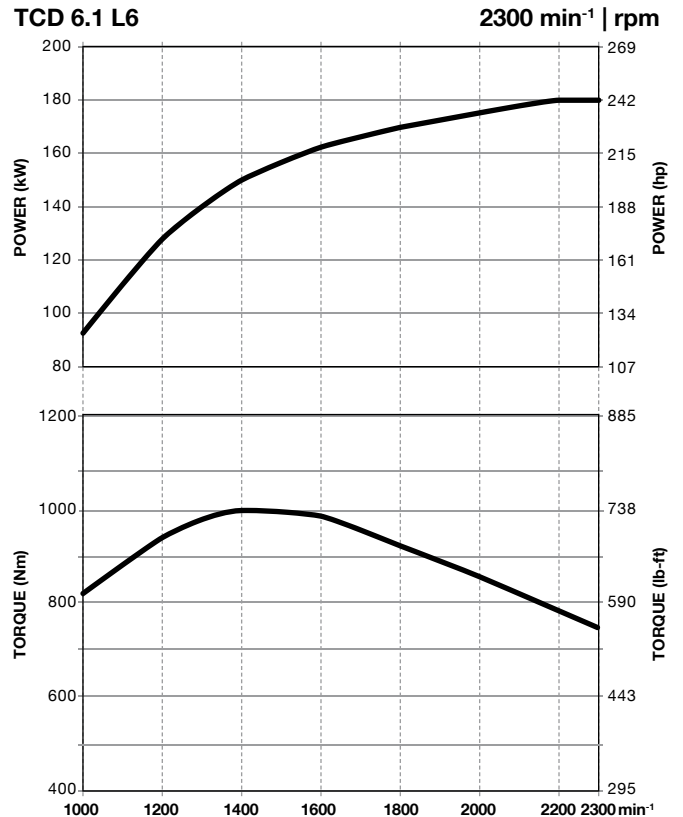
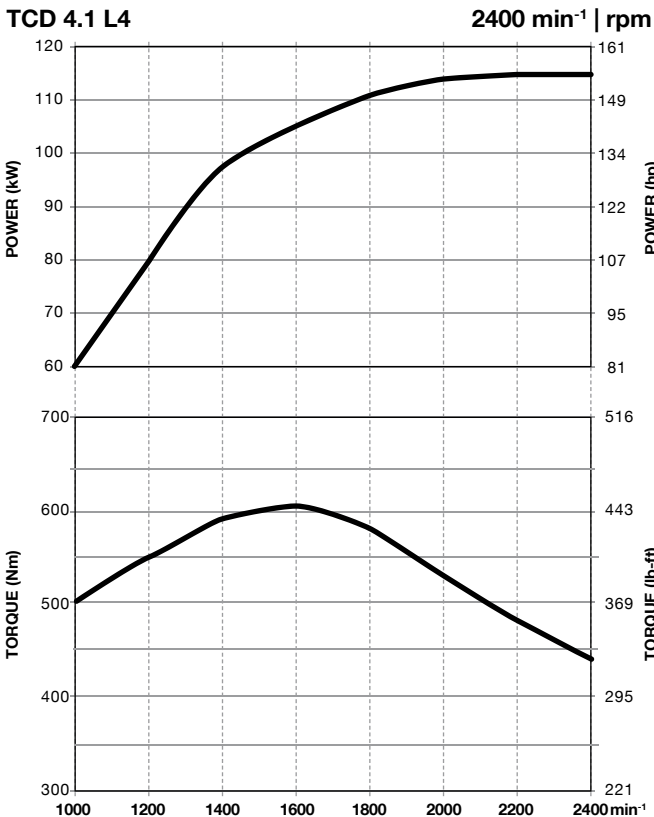
1) Power ratings at flywheel gross, without cooling system

2) At optimal operating point. Specific fuel consumption based on diesel fuel with a specific gravity of 0.835 kg/dm<sup>3</sup> at 15 °C (6.96 lb/US gallon at 60 °F).

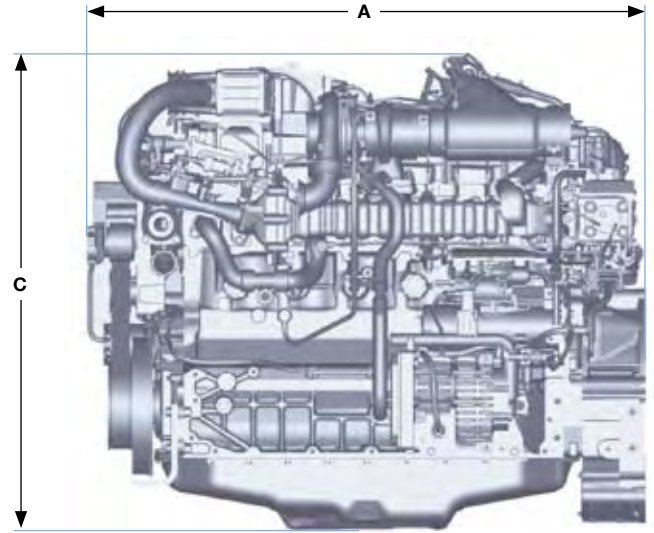
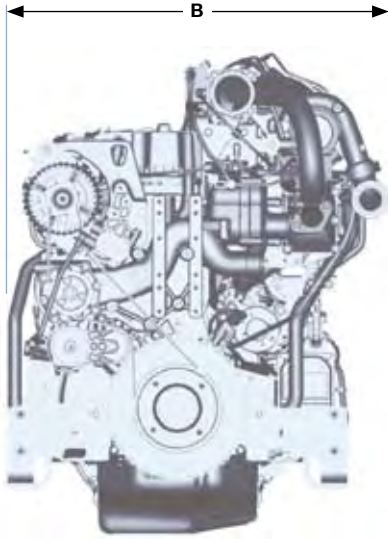
3) Without starter/alternator, cooling system and liquids but with flywheel and flywheel housing

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

## Standard Engines



| Dimensions |         | A         | B        | C        |
|------------|---------|-----------|----------|----------|
| TCD 4.1 L4 | mm   in | 783   31  | 629   25 | 812   32 |
| TCD 6.1 L6 | mm   in | 1095   43 | 680   27 | 990   39 |



## 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 or US EPA Tier 4 interim. The considerable reduction in particulate matter and NO<sub>x</sub> necessary to meet those emission regulations requires that engines be equipped with 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. 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 techniques specifically tailored to fulfil requirements while maintaining the proverbial criteria of our engines, which include high economy, dependability, and long life. The Diesel Oxidation Catalytic Converter combined with Diesel Particulate Filter (DPF) is one of the DVERT® modules we use. This is the standard technology we implement for TCD 4.1/6.1 series engines complying with the EU exhaust emission Stage III B and the US EPA Tier 4 interim.

### **Operation mode and Regeneration of the Diesel Particulate Filter**

The Diesel Oxidation Catalytic converter initially oxidizes gaseous pollutants such as HC, CO and NO. Soot particulates are then captured at nearly 100 % efficiency in a closed Diesel Particulate Filter installed after the catalytic converter. DEUTZ offers passive regeneration systems for engines with power ratings < 130 kW. The defined exhaust gas conditions, which are prerequisite for this can be achieved by implementing specific engine control measures. A continuous catalytic reaction regenerates the filter. The NO<sub>2</sub> produced in the DOC oxidizes in the Diesel Particulate Filter thereby generating the temperature required to burn off the deposits of soot. This type of filter regeneration is possible for virtually all load patterns and represents by far the most cost-effective solution.

In case of a DPF installation in combination with low exhaust temperatures, the regeneration is actively supported by an electronically controlled intake air throttle to achieve the temperature level required for the regeneration.

For engines >130 kW DEUTZ offers active regeneration solutions where the filter is regenerated by a burner combined with an exothermic reaction in the DOC. The burner creates a primary flame that is used to vaporize fuel additionally injected into the exhaust. This mixture produces a strong exothermic reaction in the downstream Diesel Oxidation Catalytic converter, which ensures that the temperature of the exhaust is increased to the level necessary for regenerating the DPF. This solution enables regeneration of the Diesel Particulate Filter at all time and for all load patterns without any impact on machine performance. DEUTZ thus offers the optimum overall solution for every application – maximum performance coupled with minimum operating costs.

### **DVERT® – solutions with a future**

Only after exhaust emission Stage EU IV / US EPA Tier 4 take effect, it will be necessary to equip engines of this series with an additional SCR system, another DVERT® module already available today.

DEUTZ worldwide:

[www.deutz.com](http://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](mailto:info@deutz.com)  
[www.deutz.com](http://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](mailto:engines@deutzusa.com)  
[www.deutzusa.com](http://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](mailto:dbj@deutz.com.cn)  
[www.deutz.com.cn](http://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](mailto:dap@deutz.com)  
[www.deutz.com](http://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](mailto:deutzoz@deutz.com)  
[www.deutz.com](http://www.deutz.com)

The engine company. 