

## CT 400.02

### Four-cylinder diesel engine for CT 400



#### Learning objectives/experiments

- in conjunction with CT 400 load unit
  - ▶ plotting of torque and power curves
  - ▶ determination of specific fuel consumption
  - ▶ determination of volumetric efficiency and lambda (fuel-air ratio)
  - ▶ energy balances
  - ▶ overall engine efficiency

#### Description

- engine for setup of a test stand in conjunction with the CT 400 load unit
- closed cooling water circuit
- easy connection with CT 400 load unit

In conjunction with the CT 400 load unit, the CT 400.02 test engine is a complete engine test stand. The engine used here is a four-cylinder diesel engine. It has its own closed cooling water circuit.

A solid welded frame on rollers carries the entire setup. Hazardous areas such as hot surfaces and rotating parts are covered with perforated plates. The connection to the brake is made via a rotationally elastic coupling with a jointed shaft. The engine is attached to the load unit by fasteners.

The engine is fitted with sensors that measure the temperatures and the cooling water flow rate. The switch cabinet contains all of the electronic equipment for managing the engine (factory set). On the switch cabinet are an ignition key, an operating time counter and warning lamps. Data is transferred between the CT 400 load unit and the engine via a data cable connecting the switch cabinets for the two units. A starter battery is also housed in the frame.

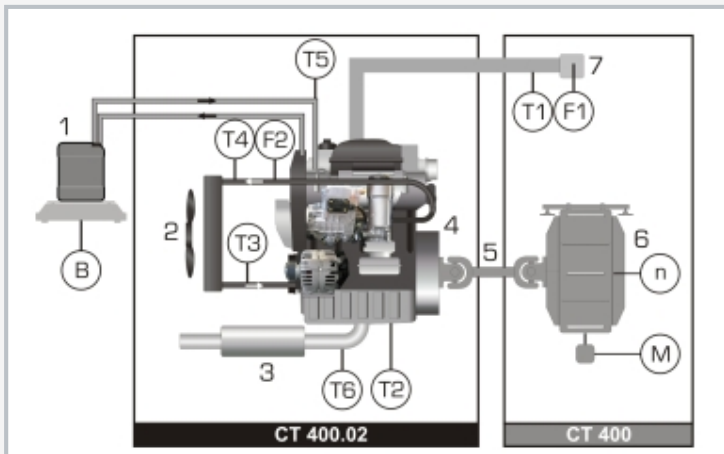
For safety reasons, the engine has been modified in a way that it only starts when it is connected to the load unit both mechanically and electrically.

# CT 400.02

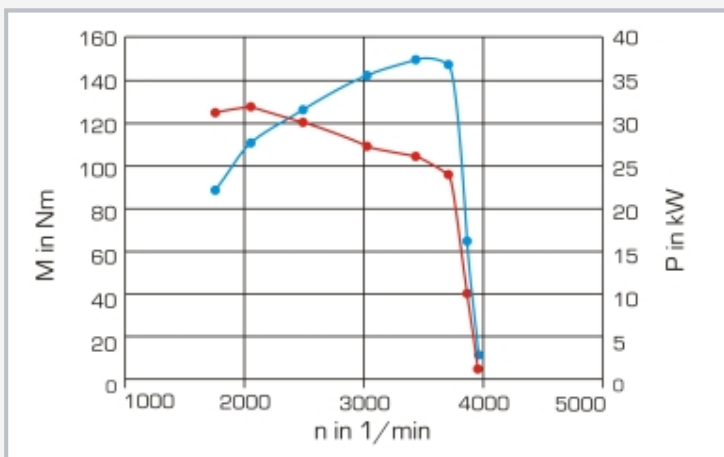
## Four-cylinder diesel engine for CT 400



1 cooling water tank, 2 cooler with protective screen, 3 exhaust gas connection, 4 fuel tank, 5 battery with main switch, 6 operating time counter, 7 warning lamps, 8 key switch for ignition, 9 connection for engine feed air



1 fuel tank, 2 radiator, 3 exhaust, 4 engine, 5 cardan shaft, 6 eddy current brake, 7 air inlet; n speed, M torque, B fuel consumption, volumetric flow rate: F1 air, F2 cooling water, temperatures: T1 intake air, T2 oil, T3 cooling water inlet, T4 cooling water outlet, T5 fuel, T6 exhaust gas



Power and torque characteristics of the engine:  
n speed, M torque, P power

### Specification

- [1] water-cooled four-cylinder diesel engine for setup an engine test stand in conjunction with CT 400 load unit
- [2] engine flexibly mounted on mobile frame
- [3] power transmission to brake unit via elastic coupling and a jointed shaft
- [4] engine complete with fuel supply (tank, pump, line) and cooling water circuit
- [5] sensors for cooling water flow rate and temperatures (exhaust gas, cooling water, fuel, oil)
- [6] transfer of measured data via data cable from switch cabinet to CT 400 control cabinet
- [7] switch cabinet with warning lamps (oil pressure, alternator failure, preheat), operating time counter and ignition key

### Technical data

Water-cooled four-cylinder diesel engine with direct injection

- displacement: 1896cm<sup>3</sup>
- bore: 79,5mm
- stroke: 95,5mm
- power output: max. 44kW at 3600min<sup>-1</sup>
- torque: max. 130Nm at 2200min<sup>-1</sup>

Starter battery: 12V

Fuel tank capacity: 5L  
Engine oil: SAE 5W-30

LxWxH: 1200x1150x1430mm  
Weight: approx. 440kg

### Required for operation

ventilation 2500m<sup>3</sup>/h

### Scope of delivery

- 1 engine, built into frame
- 1 manual

## **CT 400.02**

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#### Required accessories

CT 400                    Load unit, 75kW, for four-cylinder engines

#### Optional accessories

CT 159.02              Exhaust gas analysing unit  
CT 400.09              Electronic engine indicating system for CT 400  
with  
CT 400.17              Pressure transducer and TDC sensor for CT 400.02