

# CT 400.01

## Four-cylinder petrol 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 to the CT 400 load unit

In conjunction with the CT 400 load unit, the CT 400.01 engine is a complete engine test stand. The engine used here is a four-cylinder petrol engine with a controlled catalytic converter. 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.

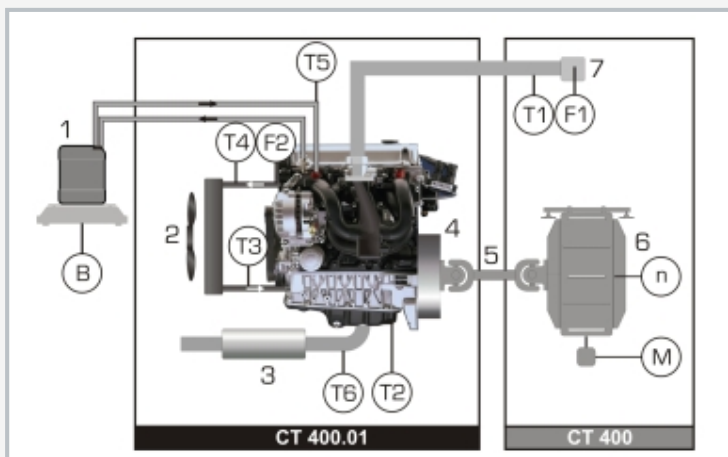
For safety reasons, the engine has been modified in a way that it only starts when it is connected to the load unit both mechanically and electrically.

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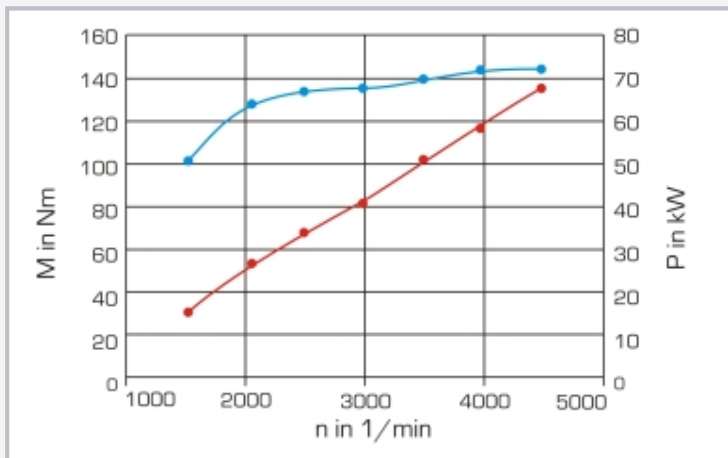
## Four-cylinder petrol engine for CT 400



1 connection for engine feed air, 2 cooling water tank, 3 radiator with protective screen, 4 exhaust gas connection, 5 battery main switch, 6 battery, 7 fuel tank, 8 operating time counter, 9 engine control lamp, 10 warning lamps, 11 key switch for ignition



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 petrol engine for setup of a test stand in conjunction with the CT 400 load unit
- [2] engine flexibly mounted on mobile frame
- [3] force transmission to brake via rotationally elastic coupling and jointed shaft
- [4] engine complete with fuel supply (tank, pump, hose) 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 switch cabinet
- [7] switch cabinet with warning lamps (oil pressure, alternator failure), operating time counter and ignition key

### Technical data

Water-cooled four-cylinder petrol engine

- displacement: 2500cm<sup>3</sup>
- bore: 89mm
- stroke: 100mm
- power output: max. 62kW at 3200min<sup>-1</sup>
- torque: max. 192Nm at 2400min<sup>-1</sup>
- compression ratio: 9,7:1
- ignition sequence: 1-3-4-2

Starter battery: 12V  
Fuel tank capacity: 5L  
Fuel: petrol 95 Octane  
Engine oil: SAE 5W-30

230V, 50Hz, 1 phase  
230V, 60Hz, 1 phase  
230V, 60Hz, 3 phases  
LxWxH: 1200x1120x1340mm  
Weight: approx. 400kg

### Required for operation

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

### Scope of delivery

- 1 engine, built into frame
- 1 manual

# CT 400.01

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### Required accessories

063.40000	CT 400	Load unit, 75kW, for four-cylinder engines
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### Optional accessories

063.15902	CT 159.02	Exhaust gas analysing unit
063.40009	CT 400.09	Electronic engine indicating system for CT 400
with		
063.40016	CT 400.16	Pressure transducer and TDC sensor for CT 400.01