

## CT 300.03 *Single Cylinder Engine w. Variable Compression for CT 300*



- \* **Operation as external ignition petrol engine or auto-ignition diesel engine**
- \* **Continuously adjustable compression ratio**
- \* **Experimental motor for demanding investigations on combustion engines**

### Technical Description

In conjunction with the CT 300 test stand, the CT 300.03 engine is a complete engine test stand.

Major technical modifications have been made to a standard water-cooled single cylinder engine to allow demanding issues in engine technology to be investigated by experiment. The key feature is that the cylinder has been modified so that its height can be adjusted along with that of the cylinder head. This allows the compression ratio to be adjusted over a wide range.

The engine can be operated as an external ignition petrol engine or an auto-ignition diesel engine. The mode of operation can be changed by a few simple conversion steps.

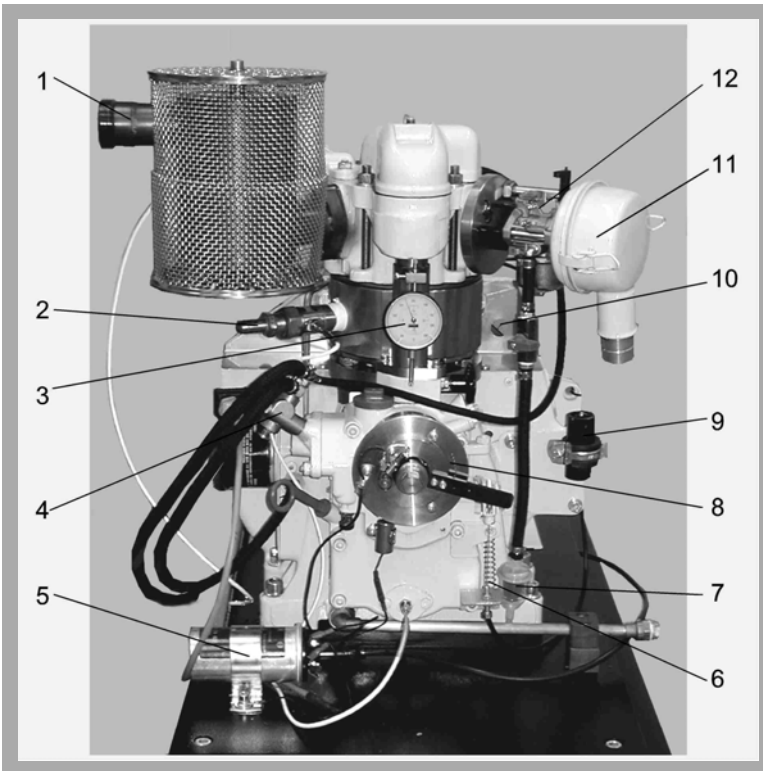
In petrol engine mode, it is also possible to change the ignition point so that the influence of this factor on the characteristic curves and values can be investigated experimentally.

The engine is mounted on a vibration-insulated base plate of the test stand CT 300 and is bolted into place. It is connected to the brake unit using an elastic claw coupling. The engine is fitted with sensors that measure temperatures and the oil pressure. The sensors are connected to the test bed switch cabinet on the CT 300. The fuel supply hoses have self-sealing quick-release couplings. The water cooling is provided by the CT 300 and the laboratory network.

### Learning Objectives / Experiments

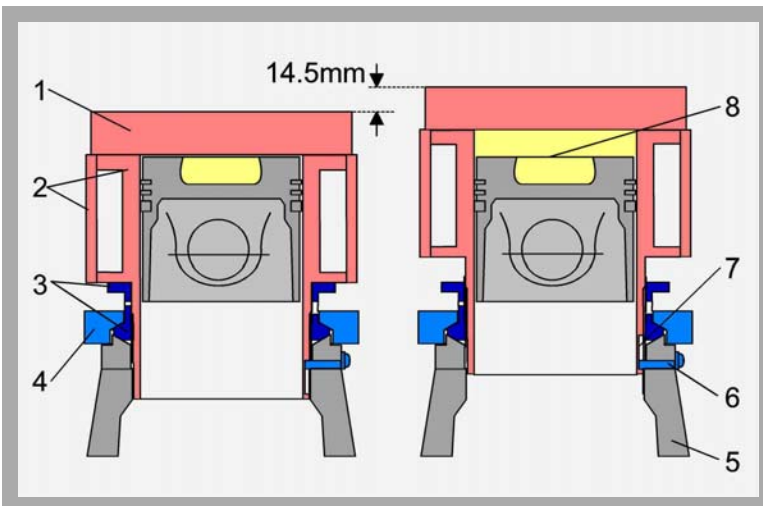
- Comparison of diesel and petrol cycles
- Plotting of torque and power curves
- Determination of specific fuel consumption
- Determination of efficiency
- Determination of volumetric efficiency and lambda (fuel-air ratio)
- Energy balances
- Determination of friction loss (in passive mode)
- Influence of compression on fuel consumption, power output, efficiency and exhaust gas composition
- Influence of ignition point on fuel consumption, power output, efficiency and exhaust gas composition

## CT 300.03 Single Cylinder Engine w. Variable Compression for CT 300



Experimental engine in diesel mode:

1 exhaust gas connection, 2 cooling water inlet, 3 dial gauge for monitoring the cylinder position when adjusting the compression ratio, 4 diesel injection pump, 5 ignition coil for petrol mode, 6 throttle cable for diesel mode, 7 petrol hose with fuel filter, 8 ignition angle adjustment, 9 mounting for diesel injector during petrol mode, 10 TDC marker indication, 11 air filter housing (without cover), 12 carburettor



Compression adjustment: minimum combustion chamber / maximum compression (left), maximum combustion chamber / minimum compression (right)

1 cylinder head, 2 cylinder with cooling jacket, 3 screw nut for height adjustment of the cylinder, 4 tensioning device, 5 crankcase, 6 locking pin (prevents the cylinder twisting when the nut is turned), 7 groove for locking pin, 8 combustion chamber

### Specification

- [1] Water-cooled single-cylinder experimental engine for setting up an engine test stand in conjunction with CT 300
- [2] Demonstration of diesel and petrol processes on an engine with variable compression
- [3] Creation of different compression ratios using a height adjustable cylinder
- [4] Adjustable ignition point
- [5] Diesel mode with direct injection
- [6] Petrol mode with carburettor
- [7] Engine mounted on base plate
- [8] Force transmission to brake unit using claw coupling
- [9] Engine completely equipped with fuel lines and temperature sensors for exhaust gas and cooling water
- [10] Fuel hoses with self-sealing quick-release coupling

### Technical Data

Water-cooled single-cylinder engine

- displacement: 470cm<sup>3</sup>
- bore: 90mm
- stroke: 74mm
- max. compression pressure: 60...70bar
- compression ratio 1:5.5...1:19
- power output: approx. 6kW at 3000rpm
- adjustable ignition point: 20° after TDC to 60° before TDC

### Dimensions and Weight

l x w x h: 600 x 600 x 650 mm  
Weight: approx. 140 kg

### Connections

Cooling water supply from CT 300 test stand  
Electrical supply from CT 300

### Scope of Delivery

- 1 engine, complete with all connections and supply lines
- 1 set of tools
- 1 manual

### Order Details

063.30003 CT 300.03 Single Cylinder Engine with Variable Compression for CT 300