



≡ FOUR-STROKE DIESEL ENGINE

TD302

Four-stroke, single-cylinder diesel engine, with modified cylinder head and crank, for use with Regenerative Engine Test Set.



KEY FEATURES

- For safe and effective studies and demonstrations of a four-stroke, single-cylinder diesel engine
- For use with TecEquipment's Regenerative Engine Test Set (TD300)
- Modified for use with optional Pressure (ECA101) and Crank Angle (ECA102) Transducers and Engine Cycle Analyser (ECA100)
- Wide range of investigations possible
- Quickly and accurately mounts on the test bed
- Includes colour-coded fuel tank with quick-release couplings

LEARNING OUTCOMES

When used with TecEquipment's Regenerative Engine Test Set (TD300), investigations into the performance and characteristics of a four-stroke diesel engine, including:

- Torque, speed and power relationship
- Brake mean effective pressure
- Engine performance curves
- Air and fuel consumption
- Volumetric and thermal efficiencies

When used with TecEquipment's Regenerative Engine Test Set (TD300), Cylinder Head Pressure Transducer (ECA101), Crank Angle Encoder (ECA102) and Engine Cycle Analyser (ECA100) students can investigate further features including:

- Plotting $p-\theta$ and $p-V$ diagrams
- The thermodynamic cycle of an internal combustion engine
- Indicated mean effective pressure
- Indicated power
- Comparison of brake and indicated mean effective pressures
- Mechanical efficiency of the engine



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DESCRIPTION

High-quality, cost-effective four-stroke, single-cylinder diesel engine for use with TecQuipment's Regenerative Engine Test Set (TD300). Adapted specially for education to enable effective laboratory testing and demonstrations, the engine includes an exhaust thermocouple, a half-coupling to link to the test bed dynamometer, and all essential hoses and fittings. In addition, each engine includes a colour-coded fuel tank with self-sealing couplings.

The couplings ensure the engine can be connected and disconnected quickly and efficiently with minimum loss or spillage of fuel. For convenience and safety, the fuel tank can be removed for filling or for storage in a fuel locker when not in use. Removing the fuel tank also prevents unauthorised use of the equipment.

The engine has a modified cylinder head and crank. These allow use with the Cylinder Head Pressure Transducer (ECA101 available separately) and the Crank Angle Encoder (ECA102 available separately). These can then connect to the Engine Cycle Analyser (ECA100 available separately) to extend the range of experiments possible.

The engine is mounted on a sturdy precision bed plate. The bed plate has dowels and slots which align and locate it accurately with the dynamometer test set. This minimises the time spent replacing one engine with another.

If a mains power failure or emergency stop occurs, interlocking relays on the engine immediately cut the fuel supply. In addition, to prevent transmission of accidentally ignited flames or explosions, the air inlet includes a flame arrestor.

The TD300 Test Bed is supplied with two sections of exhaust. A 1 metre length to connect the engine to TD300a and a second 3 m length to connect TD300a to a suitable outlet to atmosphere. All TecQuipment engines are supplied with a 1" BSP threaded stub adaptor for connection to the TD300 exhaust. Alternatively the user can connect their own adaptor and connect to their laboratory exhaust.

STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer

ESSENTIAL BASE UNIT

- Regenerative Engine Test Set (TD300)

RECOMMENDED ANCILLARIES

- Cylinder Head Pressure Transducer (ECA101)
- Crank Angle Encoder (ECA102)
- Engine Cycle Analyser (ECA100)

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Well ventilated laboratory

STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

NOISE LEVELS:

The noise level produced by this engine exceeds 95 dB at the operator position, therefore you must wear ear defenders when you use it.

SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

DIMENSIONS:

Nett: 560 mm high x 500 mm wide x 460 mm and 75 kg

Packed: 0.22 m³

ENGINE CAPACITY:

462 cc

POWER:

Approximately 7 kW at 3600 rev.min⁻¹

MAXIMUM SPEED:

Approximately 3600 rev.min⁻¹

COOLING:

Air cooled

NOTE:

- All values stated are approximate and subject to variation
- The engines supplied have very similar or equivalent specifications to that used by TecQuipment to generate the sample results. However, some performance variations will occur.
- The characteristics of some engines may vary as the latest emission regulations come into force
- For the latest performance information please refer to the engine manufacturer's website.