



MODIFIED FOUR-STROKE DIESEL ENGINE

TD212

Four-stroke, single-cylinder diesel engine, with modified cylinder head and crank, for use with Small Engine Test Set, available in pull and electric start (ES).



YANMAR ENGINE

KEY FEATURES

- For safe and effective studies and demonstrations of a four-stroke, single-cylinder diesel engine
- For use with TecQuipment's Small Engine Test Set (TD200)
- 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
- Electric start option (TD212ES)
- Includes colour-coded fuel tank with quick-release couplings

LEARNING OUTCOMES

When used with TecQuipment's Small Engine Test Set (TD200), 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
- Willans line

When used with TecQuipment's Small Engine Test Set (TD200), 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
- Engine cycle analysis
- 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 and cost-effective four-stroke, single-cylinder diesel engine for use with TecQuipment's Small Engine Test Set (TD200). 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.

This engine starts using a simple pull cord, however TecQuipment can supply an electric start version (TD212ES). The electric start version is supplied with a suitable cable to connect to the optional battery (TD200b) or another suitable battery. Contact our sales team for details.

The TD200 Test Bed is supplied with a 2.5 m exhaust. All TecQuipment engines are supplied with a 1" BSP threaded stub adaptor for connection to the TD200 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

- Small Engine Test Set (TD200)

RECOMMENDED ANCILLARIES

- Engine Cycle Analyser (ECA100)
- Cylinder Head Pressure Transducer (ECA101)
- Crank Angle Encoder (ECA102)
- 12 V Battery (TD200b) for the electric start (ES) model only)

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 may exceed 70 dB, therefore TecQuipment strongly recommends the use of suitable ear defenders.

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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 (WHEN FITTED TO BASE PLATE):

455 mm (height), 475 mm (width), 355 mm (depth)

Packed 0.15 m³

WEIGHT:

MODEL	YANMAR
TD212	33 kg
TD212ES	38 kg

Packed: 50 kg

FUEL:

Diesel to minimum specifications EN590, BS2869 A1/A2 or ASTM D 975 - 1D/2D

ENGINE CAPACITY:

219 cm³ (0.219 L) or 219 cc

POWER AND TORQUE:

3.1 kW at 3450 RPM

Torque 10 Nm at 1700 RPM

SPEED:

Governed to 3200 to 3400 RPM

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.