



## P8250 AUTOMOTIVE 1 ENGINE TEST SET

### FEATURES

- ◆ Self contained, compact easily installed bench mounted unit
- ◆ Single cylinder air cooled four stroke gasoline engine
- ◆ Electrical AC dynamometer and load bank
- ◆ Fully instrumented for air and fuel flow, exhaust temperature, speed and power
- ◆ Optional Single Cylinder Diesel Engine ( P8252)

### EXPERIMENTAL CAPABILITY

- ◆ Engine performance curves at full and part load
- ◆ Engine efficiency and fuel consumption variation with speed and load
- ◆ Effect of mixture strength on gasoline engine performance and fuel consumption
- ◆ Effect of mixture ignition timing on gasoline engine performance and fuel consumption
- ◆ This unit is provided with a lean/rich fuel mixture device.

### DESCRIPTION

Cussons Automotive 1 Engine Test Set is the smallest engine test in the Cussons ranges. It is a self-contained compact unit designed for easy installation and bench mounting, although a wheeled stand (P8251) is available as an optional extra.

An automotive alternator is used as a dynamometer to load the engine and dissipate the power in a resistive load bank. The alternator is modified to provide manual control of the load. The test set is supplied as standard with a Briggs and Stratton single cylinder, four stroke, spark ignited, air cooled, side valve engine which is typical of small engines used in a variety of industrial and domestic applications throughout the world. A Diesel engine is offered as a separate alternative ( P8252)

The engine and dynamometer are carried on a solid steel baseplate resiliently mounted within a steel framework.

Included within the framework are the fuel system, which incorporates a fuel tank and fuel solenoid valve, and the air induction system. The instrumentation and control panel is mounted on the front of the frame.

The engine is supplied with a cylinder head drilled and tapped to accept a piezo pressure transducer for

the easy addition of electronic indicating equipment.

### EXPERIMENTAL WORK

The Cussons P8250 Automotive 1 Engine Test Set allows the following engine parameters to be determined at different speeds:

- Engine torque
- Brake power
- Volumetric fuel consumption
- Specific fuel consumption
- Air flow rate
- Air/Fuel ratio
- Volumetric efficiency
- Brake mean effective pressure (bmep)

### INSTRUMENTATION AND CONTROLS

The instrumentation and control panel is made from a durable melamine resin coated laminate and carries full operating instructions together with details of the test procedure which can be carried out.

The controls provided include a manual engine throttle and adjustment of the excitation applied to the alternator which act together to provide complete and efficient control of the engine speed and load. The petrol engine carburettor is modified to include a mixture control.

The following instrumentation is included:

- Engine speed
- Dynamometer output voltage
- Dynamometer output current
- Air-flow - by orifice plate and manometer
- Fuel flow - by burette
- Exhaust temperature indication - by thermocouple

Engine power and torque may be easily determined from the electrical output of the dynamometer. The efficiency characteristics of the machine are supplied thus enabling the mechanical input power and torque to the dynamometer to be calculated from the electrical output of the alternator, and the alternator speed.

### DYNAMOMETER

Lucas 3 phase, star connected, 12 pole automotive alternator with integral output and field diodes, rated at 45 Amp 6000 rev/min with a maximum continuous speed of 15000 rev/min. The alternator is modified to allow external control of the field excitation circuit. The machine is belt driven and the

electrical power is dissipated in a resistive load bank.

### STANDARD ENGINE

Briggs & Stratton four stroke, air cooled, single cylinder, side valve, spark ignited engine having a capacity of 127cc, maximum power 2.2kW (3 bhp) at 3600 rpm. The engine is fitted with a modified carburettor to allow adjustment of the mixture strength. The cylinder head is drilled and tapped to allow for the fitting of a piezo pressure transducer.

### ADDITIONAL EQUIPMENT

#### P8252 - Air cooled Single Cylinder Diesel Engine for use with P8250 Automotive 1

The cylinder head is drilled and tapped to allow for the fitting of a piezo pressure transducer.

#### P8251 - Wheeled Stand

Fabricated steel stand designed specifically to mount the P8250 Automotive 1 Engine Test Bed, and provided with a shelf for storage.

#### P4605 - 4 Channel Basic Electronic Engine Indicating & Combustion Analysis System for Gasoline & Diesel

### SERVICE REQUIREMENTS

The test set does not present significant installation problems being designed for placement on a sturdy laboratory bench and provided with the following services:-

- Engine exhaust outlet.
- Single phase power supply 220/240 volt, 50/60 Hz rated 2 amps. Alternative voltages can be supplied on request.
- Since all the power is dissipated as heat to the

	Nett Weight	Length	Width	Height
	kg	mm	mm	mm
P8250	63	950	560	620
P8251	30	1000	580	900