VCR Engine Test Setup (Computerised) ...Code 234

Single cylinder, Four stroke, VCR, Diesel with EGR

Description

The setup consists of single cylinder, four stroke, VCR (Variable Compression Ratio) Electric start Diesel engine connected to eddy current type dynamometer for loading. The compression ratio can be changed without stopping the engine and without altering the combustion chamber geometry by specially designed tilting cylinder block arrangement. Setup is provided with necessary instruments for combustion pressure and crank-angle measurements. These signals are interfaced to computer through engine indicator for Pθ–PV diagrams. Provision is also made for interfacing airflow, fuel flow, temperatures and load measurement. The set up has stand-alone panel box consisting of air box, two fuel tanks for blend test, manometer, fuel measuring unit, transmitters for air and fuel flow measurements, process indicator and engine indicator. Rotameters are provided for cooling water and calorimeter water flow measurement.

The setup enables study of VCR engine performance with EGR for brake power, indicated power, frictional power, BMEP, IMEP, brake thermal efficiency, indicated thermal efficiency, Mechanical efficiency, volumetric efficiency, specific fuel consumption, A/F ratio and heat balance. Labview based Engine Performance Analysis software package "Enginesoft" is provided for on line performance evaluation.

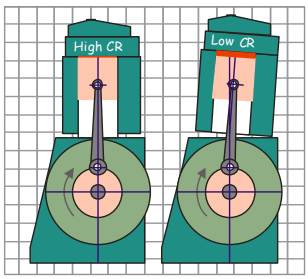
A computerized Diesel injection pressure measurement is optionally provided

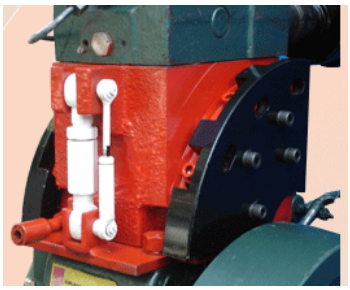
Features

- CR changing without stopping the engine
- No alteration in Combustion chamber geometry
- Water cooled EGR
- Electric start with battery and charger
- Arrangement for blend test
- PΘ-PV plots, performance plots and tabulated results
- Data logging, editing, printing and export, Configurable graphs
- IP,IMEP,FP indication, combustion analysis

Range of Experiments

- Study of VCR engine performance (Computerized mode)
- Study of emissions with EGR variation
- Study of combustion with different fuel blends
- Study of pressure volume plot and indicated power





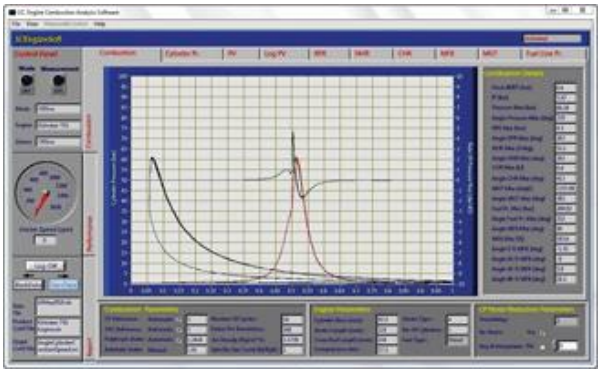
Utilities Required

Electric supply
230 +/- 10 VAC, 50 Hz, 1 phase

Computer
IBM compatible with standard configuration

Water supply
Continuous, clean and soft water supply @ 1000 LPH, at 10 m. head. Provide tap with 1" BSP size connection

Software



EngineSoft is Labview based software package developed by Apex Innovations Pvt. Ltd. for engine performance monitoring system. EngineSoft can serve most of the engine testing application needs including monitoring, reporting, data entry, data logging. The software evaluates power, efficiencies, fuel consumption and heat release. It is configurable as per engine set up. Various graphs are obtained at different operating condition. While on line testing of the engine in RUN mode necessary signals are scanned, stored and presented in graph. Stored data file is accessed to view the data graphical and tabular formats. The results and graphs can be printed. The data in excel format can be used for further analysis.

Specifications

Product	VCR Engine test setup 1 cylinder, 4 stroke, Diesel with EGR (Comp.)
Product code	234
Engine	Make Kirloskar, Type 1 cylinder, 4 stroke Diesel, water cooled, power 3.5kW @ 1500rpm, stroke 110mm, bore 87.5mm. 661cc, CR17.5. Modified CR 12-18 (special case CR 12-22). Electric start arrangement.
VCR arrangement	CR change is accomplished with special features as below • The compression ratio can be changed without stopping the engine. • Without changing the combustion chamber geometry and cylinder head. • It is furnished with specially designed tilting cylinder block mechanism.
Dynamometer	Type eddy current, water cooled
Propeller shaft	With universal joints
Air box	M S fabricated with orifice meter and manometer
Fuel tank	Capacity 15 lit with glass fuel metering column
Calorimeter	Type Pipe in pipe
EGR	Water cooled, SS 304, Range 0-15%
Piezo sensor	Range 5000 PSI with low noise cable
Crank angle sensor	Resolution 1 Deg, Speed 5500 RPM with TDC pulse.
Data acquisition device	Analog inputs: 16 SE/8 DIFF; Digital I/O: 8; Analog outputs: up to 2; counters 2 x 32 bit; Sample rate: 250 kS/s; Resolution: 16- bit; Analog input Vmax ±10V of AI GND; High speed multifunction USB DAQ card
Piezo powering unit	Model AX-410.
Temperature sensor	Type RTD, PT100 and Thermocouple, Type K
Temperature transmitter	RTD PT100, Range 0–100°C,3 Nos; Thermocouple, Range 0-1200 °C, 2 Nos
Load indicator	Digital, Range 0-50 Kg
Load sensor	Load cell, type strain gauge, range 0-50 Kg
Fuel flow transmitter	DP transmitter, Range 0-500 mm WC
Air flow transmitter	Pressure transmitter, Range (-) 250 mm WC
Software	“EngineSoft” Engine performance analysis software
Rotameter	Engine cooling 40-400 LPH; Calorimeter 25-250 LPH
Pump	Type Monoblock
Overall dimensions	W 2000 x D 2500 x H 1500 mm
Optional	Computerized Diesel injection pressure measurement with injection variation 0-25 deg BTDC

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