



Features

- Designed for comprehensive analysis of performance of different automobile engines.
- Digital Instruments for measurement of parameters like fuel consumption, air flow, temperature and RPM etc.
- Demonstration of performance of Diesel Engines at different throttle settings & Loads.
- Optional High Speed Data Acquisition system for performance monitoring.

Tesca Automotive 4 Stroke 4 Cylinder Diesel Engine Test Bed 32743-32744 are designed to facilitate testing of different automobile diesel engines. The test bed is complete with eddy current dynamometer and measuring instruments for measuring key engine parameters required for performance analysis of an engine. The test bed can be used for testing of diesel engines rated up to 3 kW.

The test bed consists of a water cooled eddy current dynamometer or Rope-Brake dynamometer, fixed on a heavy-duty steel frame. The test bed is designed in such a way that the engine to be tested can be quickly coupled to the dynamometer with minimum effort. The test bed is equipped with dynamometer control panel with necessary safety instruments. The Engines can be used for performance tests for different loads and speeds under various throttle-opening conditions. The eddy current dynamometer provides a variable load on the engine, allowing the characteristic power and torque curves to be reproduced in the laboratory. The system comes complete with extensive instrumentation, including rpm measurement, torque (from which power can be calculated), plus various temperatures, Fuel Consumption, Air Consumption.

Different optional accessories are available to integrate with the Engine Test Bed for comprehensive engine performance analysis. These include the exhaust gas calorimeter (For Heat Balance Sheet), advance Data Acquisition System & P-V Diagram module for computerized testing.

Specifications

Eddy current Dynamometer:

- Maximum Power : ± 150 kW
- Maximum Torque : ± 500 Nm
- Maximum Speed : $\pm 8,000$ rpm
- Moment of Inertia : ± 0.093 kg.m²
- Water cooled type that shall enable for long run testing without dropping the performance of the Dynamometer.
- Capable of absorbing & measuring power in both directions of rotations (Bi-directional), in accordance with its Power and Torque characteristic curves.
- Oil Injected Type of Coupling and Grease Lubricated Shaft Bearings.
- Set of Weighing System comprises of calibration arm, weight pan assembly and calibration weight (25 kg each) that traceable to National Standard
- Set of Basket Type Strainer come with Magnetic Filter with 500 micron of filtration install at water inlet piping to

Note: Specifications are subject to change.

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avoid damage due to iron impurities in water at the site.

- Set of 60 toothed wheel & non-contact type magnetic pulse pick-up sensor for measurement of speed.
- Differential water pressure switch, for monitoring the required water pressure supply and achieve trip condition against high temperature than the set limit.
- Bearing temperature thermocouples
- Electro-less Nickel plating on water passages (groove side) of loss plates to ensure that corrosion does not detract from performance.

Optional

- Rope brake dynamometer with loading unit
- Electrically Dynamometer with loading unit
- Hydraulic Dynamometer with Pump & Sump tank and loading unit

Dynamometer Controller

Engine: Diesel Engine

- 2.0L Non-Turbo Diesel Engine or better
- In-Line 4-Cylinder
- 4-Stroke
- SOHC
 - ♦ Battery and Isolator Box
 - ♦ Engine Exhaust Piping
 - ♦ Heat Exchanger Cooling Module to control temperature of the Engine Coolant and Engine Oil. Temperature is controlled by the PID Valve to avoid thermal shock during cooling.
 - ♦ Fuel tank supply that auto filling to the Gravimetric Fuel Measurement System
- Measuring Instruments –
 - ♦ Engine RPM Sensor
 - ♦ Differential Pressure Transmitter for Air
 - ♦ Fuel Level Sensor
 - ♦ Thermocouples
 - ♦ Torque Sensor

Accessories:

- Battery for starting the engines
- Set of Anti Vibration Pads
- Auxiliary cooling unit for engine
- Pipe In pipe type heat exchanger
- Thermocouples for water & gas temperature.

Data Acquisition System & Software (Optional)

- Data Acquisition collection data compliance to ISO 1585:1992 (E) :
 - ♦ Engine Power
 - ♦ Engine Torque
 - ♦ Engine Speed
- Pressure Sensors :
 - ♦ Barometric Pressure
 - ♦ Exhaust Back Pressure
 - ♦ Air Intake Pressure
- Temperature Sensors :
 - ♦ Fuel Temperature
 - ♦ Inlet Air Temperature
 - ♦ Engine Coolant Temperature
 - ♦ Engine Oil Temperature
 - ♦ Exhaust Temperature

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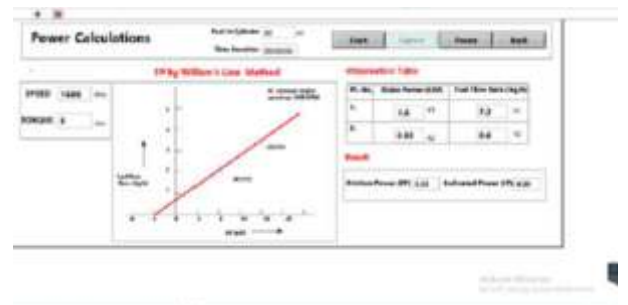
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DAQ Screen Shot



Power Calculations from William Line



- ♦ Dynamometer Water Inlet Temperature
- Humidity Sensor
- Hot-Film Air Mass Meter
- Gravimetric fuel Measurement System
- P-V Diagram Module (Optional)
 - ♦ Engine cylinder pressure
 - ♦ Crank angle Encoder

Exhaust Gas Analyzer (Optional)

- Measure Gases :

- CO (0-10%)
- CO₂ (0-16%)
- HC (0-5000ppm)
- O₂ (0-21%)
- Lambda (0.8-1.2)
- NO_x (0-5000ppm)

Usable on Petrol / Gasoline, LPG, CNG and Diesel vehicles

Experiments

- Investigate Engine Performance at different Throttle Settings & Load conditions.
- Calculation of Mechanical Efficiency & Plot brake power versus mechanical efficiency.
- Measurement & Calculation of Volumetric efficiency.
- Measurement & Calculation of specific fuel consumption
- Measurement & Calculation of brake thermal efficiency
- Determining air / fuel ratios
- Heat Balance Test (With Optional Exhaust Gas Calorimeter)
- Study of P-q & P – V Diagram for Engine (With optional P-V Module & Data Acquisition System).

Statutory Requirements

- Cold Water Circulation or Cooling Tower
- Mains Power Supply: 220-240V, 1Ph, 50Hz & 400-440V, 3Ph, 50Hz
- Exhaust Gas Outlet arrangement

Scope of Delivery

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

32743 : 4 Stroke 4 Cylinder Diesel Engine Test Bed With DAQ

32744 : 4 Stroke 4 Cylinder Diesel Engine Test Bed Without DAQ

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