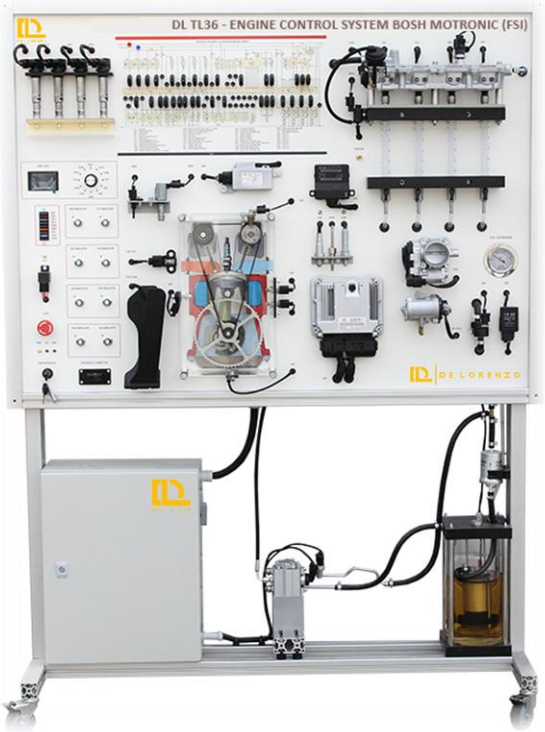
# ENGINE CONTROL SYSTEM
# BOSCH MOTRONIC MED 9.0 TRAINER




# DL TL36

## *PURPOSE OF THE TRAINER*

This training equipment **DL TL36** is intended for demonstration, training and learning of the design, construction, principle of operation, settings and adjustments of a direct petrol (gasoline) injection control system **Bosch Motronic MED 9.0** (**FSI – F**ield **S**tratified **I**njection). It is based on **OEM** (**O**riginal **E**quipment **M**anufacturer) components of **Volkswagen Golf V car**.

With it, it's possible to change the engine operating parameters, monitor fuel injection. It includes all the engine management components as in the real car, such as fuel supply, exhaust and ignition systems, helping users to understand how these parts interact. It is possible to perform various measurements of the system installed in the training equipment, parameters of ongoing processes, to perform fault simulations, to diagnose.

## *MAIN FEATURES*

- A complete electrical wiring diagram is available to help with system checks and troubleshooting.
- High and low pressure fuel supply systems with visible low-pressure pump operation.
- Monitoring and measurement over 20 electrical values in real time using banana plug connectors.
- Key settings can be adjusted manually, including:

- Crankshaft speed,
- Coolant temperature,
- Lambda sensor reading,
- NOx sensor reading,
- Intake manifold pressure,,
- Exhaust gas temperature.

- OBD II 16-pin diagnostic connector supporting:
  - ECU identification,
  - Live data reading,
  - Fault code management,
  - Actuator testing,
  - Throttle adaptation,
  - Control unit coding/configuration.
- Sensor signal simulation such as lambda, NOx, exhaust gas temperature, intake pressure, and manual fault simulation via circuit jumper disconnection.
- Voltage display from critical engine sensors and actuators such as:
  - Accelerator pedal,
  - Throttle position,
  - EGR (**E**xhaust **G**as **R**ecirculation),
  - Intake manifold flap,
  - Fuel pressure,
  - Temperature sensors.
- The system can analyze synchronization between the crankshaft and camshaft.

## *EDUCATIONAL OBJECTIVES*

With this equipment and with the help of a complete wiring diagram of the direct petrol injection system (FSI), the **STUDENTS** can:

- Learn how fuel supply, exhaust, and ignition systems work together in direct petrol injection engines using real **OEM** components.
- Understand both high and low pressure fuel systems, including injected fuel quantity and spray pattern quality.
- Explore how the crankshaft and camshaft synchronize during engine operation.
- Practice diagnosing over 20 types of electrical faults by disconnecting banana plug connectors to simulate real issues.
- Adjust engine parameters manually using potentiometers and simulators such as:
  - Crankshaft speed,
  - Sensor values,
  - Airflow rate,
  - Temperature readings.
- Study the electrical circuits of key components used in direct injection engines.
- Learn how modern ignition systems operate and how to troubleshoot them.

- Use banana plug connectors to monitor and measure electrical signals in real time with tools like an oscilloscope, multimeter, scan tool, or the built-in TFT voltmeter.
- Simulate sensor signals such as:
  - Lambda (oxygen) sensor,
  - Engine temperature,
  - NOx sensor,
  - Exhaust gas temperature,
  - Intake manifold pressure.
- Read and interpret voltage signals from various engine sensors and measure high-voltage ignition circuits.

For the **TEACHER**, this equipment gives a **big support** to carry out **meaningful activities,** basing on:

- **Compact and mobile design** with a strong, lightweight aluminum frame – perfect for classroom use and long-term safety.
- **Real OEM components** providing realistic and safe hands-on training, closely replicating real vehicle systems.
- **Real-time monitoring and fault simulation** helping students to understand systems better and to improve troubleshooting skills.
- **Quick reset to default settings** with minimal adjustments – making it easy to prepare for each lesson.
- **Closed panels and internal wiring** protect sensitive parts and ensure safe operation.
- **Advanced training tools** allowing students to explore key automotive systems and diagnostics interactively.
- **Compatibility with Audi/VW OEM systems**, allowing diagnostics with most multibrand, specialized, or OEM scan tools.

## *GENERAL FEATURES*

The equipment has the following general features:

- Dimensions: approx. (HxLxW) 1820 x 1360 x 500 mm.
- Weight: approx. 100 kg.
- Power supply: single-phase from the mains.

## *SUGGESTED ACCESSORIES (NOT INCLUDED)*

- A multimeter.
- An oscilloscope.
- OBD scanner.

The equipment is supplied with an operating manual including equipment introduction and operation method.