

## FUEL INJECTION AND GM ENGINE MANAGEMENT TRAINER



The ConsuLab EM-330-1 Fuel Injection and Engine Management Trainer functions as in a real automobile, but uses non-flammable fluid instead of gasoline for safety and educational purposes. The trainer is used to teach and demonstrate engine management systems in a vehicle.

### EDUCATIONAL ADVANTAGES

- Allows demonstration of engine management systems in a classroom environment.
- Allows full communication with a scan tool for fault codes and data stream.
- Live fuel injection operation using non-flammable fluid in a transparent enclosed system.
- Live ignition system function with observable spark.

### APPLICATION

- GM Chevrolet Cobalt / Pontiac G5 2007+

### STANDARD EQUIPMENT AND FEATURES

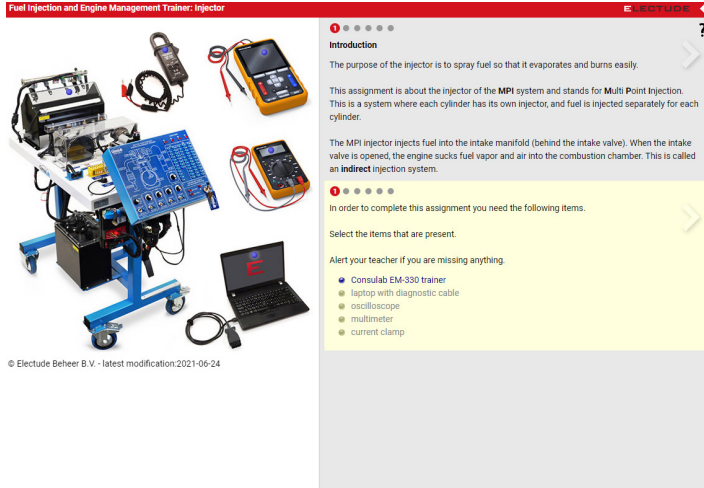
- All OEM components, wiring, connectors and wire colors
- No component simulation
- OBDII data link connector
- Integrated ECM breakout box
- All engine input sensors and output actuators
- Return type fuel system with pressure regulator
- COP (Coil-On-Plug) ignition system
- ECM breakout box with test receptacles for test equipment hookup
- Adjustable sensor inputs

### PHYSICAL SPECIFICATIONS

- **Dimensions:** 21.5 x 47 x 46 inch (54.6 x 119.4 x 116.8 cm) / 40 x 78 x 48 inch (101.6 x 198.1 x 121.9 cm) with packaging
- **Weight:** 177 lb (80.3 kg) / 345 lb (156.5 lb) with packaging

## FUEL INJECTION AND GM ENGINE MANAGEMENT TRAINER

Fuel Injection and Engine Management Trainer: Injector



**Introduction**

The purpose of the injector is to spray fuel so that it evaporates and burns easily.

This assignment is about the injector of the MPI system and stands for Multi Point Injection. This is a system where each cylinder has its own injector, and fuel is injected separately for each cylinder.

The MPI injector injects fuel into the intake manifold (behind the intake valve). When the intake valve is opened, the engine sucks fuel vapor and air into the combustion chamber. This is called an indirect injection system.

In order to complete this assignment you need the following items.

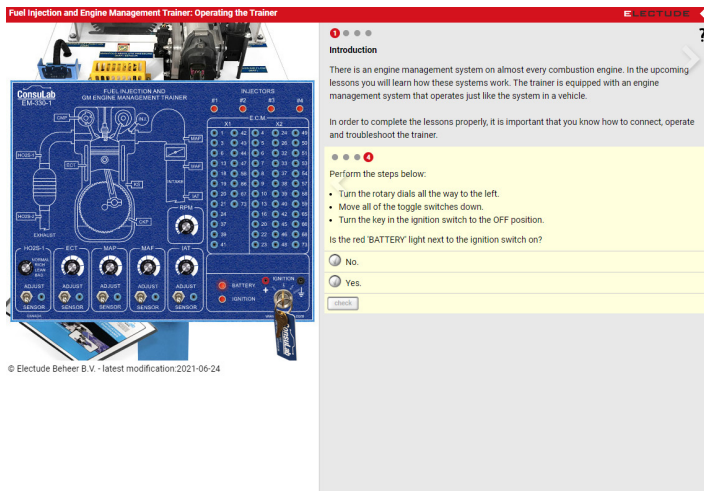
Select the items that are present.

Alert your teacher if you are missing anything.

- Consulab EM-330 trainer
- laptop with diagnostic cable
- oscilloscope
- multimeter
- current clamp

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Fuel Injection and Engine Management Trainer: Operating the Trainer



**Introduction**

There is an engine management system on almost every combustion engine. In the upcoming lessons you will learn how these systems work. The trainer is equipped with an engine management system that operates just like the system in a vehicle.

In order to complete the lessons properly, it is important that you know how to connect, operate and troubleshoot the trainer.

Perform the steps below:

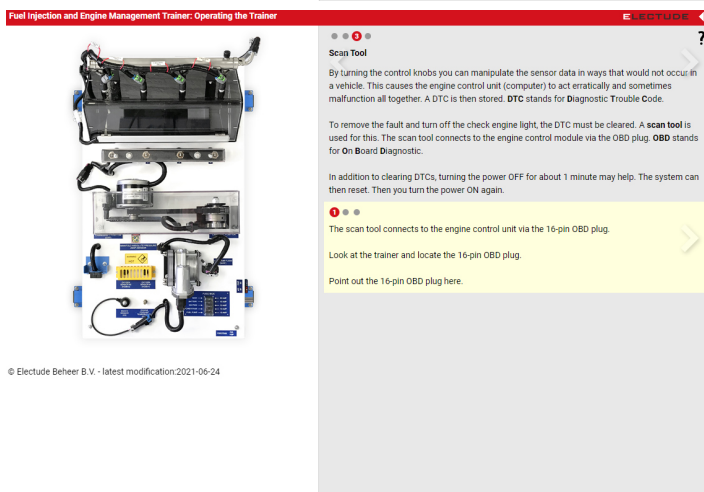
- Turn the rotary dials all the way to the left.
- Move all of the toggle switches down.
- Turn the key in the ignition switch to the OFF position.

Is the red 'BATTERY' light next to the ignition switch on?

No.  
Yes.

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Fuel Injection and Engine Management Trainer: Operating the Trainer



**Scan Tool**

By turning the control knobs you can manipulate the sensor data in ways that would not occur in a vehicle. This causes the engine control unit (computer) to act erratically and sometimes malfunction all together. A DTC is then stored. DTC stands for Diagnostic Trouble Code.

To remove the fault and turn off the check engine light, the DTC must be cleared. A scan tool is used for this. The scan tool connects to the engine control module via the OBD plug. OBD stands for On Board Diagnostic.

In addition to clearing DTCs, turning the power OFF for about 1 minute may help. The system can then reset. Then you turn the power ON again.

The scan tool connects to the engine control unit via the 16-pin OBD plug.

Look at the trainer and locate the 16-pin OBD plug.

Point out the 16-pin OBD plug here.

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# ELECTUDE

**THE CONSULAB EM-330-1 FUEL INJECTION AND GM ENGINE MANAGEMENT TRAINER IS NOW AVAILABLE WITH ELECTUDE COURSEWARE (SOLD SEPARATELY).**

The Fuel Injection and Engine Management Trainer consists of a practical setup and the associated E-learning. With this practical setup, the participant can supplement previously acquired knowledge about the engine management system with practical skills.

The set-up has a fully functioning engine management system, but at the same time offers the advantage of a safe learning environment. All relevant components are present and function just like in a real vehicle. Due to the presence of control buttons, sensor values can be changed and the system will respond to this. This allows the functioning of the system (cause and effect) to be experienced and understood. Because the Trainer has a Break-out box with measurement connections and an OBD plug, students can perform measurements on the system using a multimeter, oscilloscope or diagnostic tester.

Through the preparatory theory and practical assignments, the participant learns :

- To recognize sensors and actuators.
- To understand the operation of sensors and actuators.
- To read electrical diagrams.
- To carry out measurements and checks on sensors and actuators by applying a diagnostic tester, multimeter or oscilloscope.
- To analyze and draw conclusions from measured values.
- To understand and explain the operation of an engine management system.
- To understand the structure and operation of control loops.
- How the engine control module processes signals.
- How the engine control unit detects any failure.
- To investigate and explain a number of operating modes.

**Includes 18 practical learning modules for a total of 19 hours of instruction.**