

EAU-962

Auxiliary Electrical Systems with Multiplexing

The trainer is designed to aid the study of new technologies applied to the Auxiliary Electrical Systems incorporated into vehicles, those systems which carry out additional functions (i.e. other than producing movement).

The parts used in the trainer are genuine and found in the most recent generation of the Ford Focus, which uses the Multiplex CAN-BUS network, a system with ultrasound parking sensors, an interior rear-view mirror with automatic darkening and anti-dazzle light sensors, and a combined rain / luminosity sensor to automatically switch on the lights and start the windscreen wipers.

The trainer has the components and accessories necessary for its performance to be similar to those systems contained in a vehicle.

Ref.: 9EQ962EA6C - 230 V

Ref.: 9EQ962EA3C - 115 V



Teaching application

The teaching model is based on activities with genuine car parts arranged to **facilitate the student's learning process**:

- The **application is real**, with all of the pieces of the vehicle that are to be learned about effectively integrated (electrical installations, connections, cabling, components, circuits, etc.).
- Help in **significantly reducing** procedural activities **learning time**, thanks to the easy accessibility to the components, connectors and verification points. In addition, the characteristics of a car mounted motor are preserved.
- The instructor has the possibility of **demonstrating** the various systems and how to check the symptoms of different malfunctions.
- It enables students to develop **diagnostic** capabilities using **professional tools** and to repair break-downs.
- It is **motivational** for the students.

Teaching characteristics

The student will develop many skills using this equipment:

1. Diagram interpretation.
2. Circuit Analysis.
3. Identification of symbols, connectors, cable coding and component location.
4. Verification and analysis of components and systems.
5. Maintenance and regulation of the auxiliary electrical systems.
6. Use and interpretation of technical documentation.
7. Instrument operation for verification and diagnosis.
8. Diagnosis and repair of break-downs.
9. Simulations of malfunctions, verification and symptom recognition.

Teaching features

A system enabling analysis, diagnosis and repair of breakdowns in different circuits is incorporated into the control panel, and includes:

- A terminal plate for measuring the tension and intensity of current in system components.
- Module to generate malfunctions and breakdowns representative of those that could really appear in a vehicle.
- Equipment usage authorization switch.
- Switch to disconnect the multiplex network on the instrument panel.

User Manual.

This manual contains explanations regarding the workings of different circuits, diagrams of basic principles, real related reference diagrams, fuse characteristic, relays, lamps and electrical boxes, standards regarding light installation, operating standards for the equipment, characteristics, maintenance, etc.



SIRVAUT software integrated in the equipment.

Practice Activities Manual.

The manual proposes different types of activities that can be carried out using the trainer. It includes answers and appropriate solutions to the problems



presented in order to make the teaching process easier. Identification of individual components, identification of systems, verification of sensors and actuators, verification of signals, re-creation and identification of breakdown symptoms, breakdown search and find, proposals for defect resolution, virtual repair, etc.

Wiring diagram manual.

This is a manual of electrical diagrams similar to that used in automobile repair workshops and will help in the activities where circuits are followed, in locating and identifying installations, and in determining the breakdowns that have been initiated in the trainer.

Technical characteristics

- Light system with switch and panel illumination:
 - Automatic front headlights with running lights and turn signal, headlight stabilizer in case of braking.
 - Electrical headlight balancing system.
 - Rear lights.
 - Back and front anti-fog lights.
 - Turn signals.
 - Emergency light.
 - Interior light.
 - Hatchback light.
 - Number plate light.
 - Third break light.
 - Backup lights.
- Door and Hatchback opening and closing systems with a remote control:
 - Centralized locking.
 - Fuel tank lock.
 - Hatchback lock.
- Motors and buttons for the front electric windows openers integrated in the multiplex network.
- Rear-view mirrors:
 - Adjustable heated exterior mirrors.
 - Interior mirror with automatic darkening and light sensor based dazzle control.
- Ultrasound parking sensors.
- Rain and luminosity sensor for automatic headlights and windscreen wipers.
- Front and back windscreen wipers.
- Pump for windscreen cleaning liquid.
- Horn with a button incorporated on the steering wheel.
- Accessories plug-in socket.
- Fuel level sensors.
- Motors for automatic closing of fuel tank.
- Switch for brake, hatchback and backup lights.
- Illuminated instrument panel indicating:
 - Lighting and signalling system.
 - Fuel level.
- Emergency light switch.
- Steering wheel with light and windscreen wiper switches.
- Central Electrical Box and battery, fuse, relay unions.
- Standard EOBD (EOBDII) connection.
- Power Supply (battery substitute).
- Back window heating simulator.
- Terminal plates enabling the measurement of signals in different components of the system for analysis, diagnostics and breakdown repair.

- Module for generating breakdowns.
- Safety systems made up by:
 - Function permission button.
 - Protection with bornier tests.
- The equipment is mounted on wheels.
- Dimensions and weights
 - Equipment dimensions: 1.250 x 1.080 x 1.900 mm.
 - Package dimensions: 1.465 x 1.230 x 2.080 mm.
 - Package weight: 300 kg.

INCLUDED ACCESSORIES:

Safety connectors, test points, fuses and screwdrivers.

BREAKDOWNS

Using a repair program system, the trainer can introduce malfunctions or breakdowns to the motor.

There are two options:

- Interactive computer-aided virtual repair system for breakdowns (SIRVAUT) which enables not only breakdown analysis but also virtual repair generating a history log for evaluation by the instructor.
- Manual breakdown repair system (using switches)



New real components

The components used to manufacture the trainer are original and new from the manufacturer, so that the difference between training practice and work in a real workshop will be minimal. Some of the equipment details are presented below:

The components are easily removed with a quick fixing system.

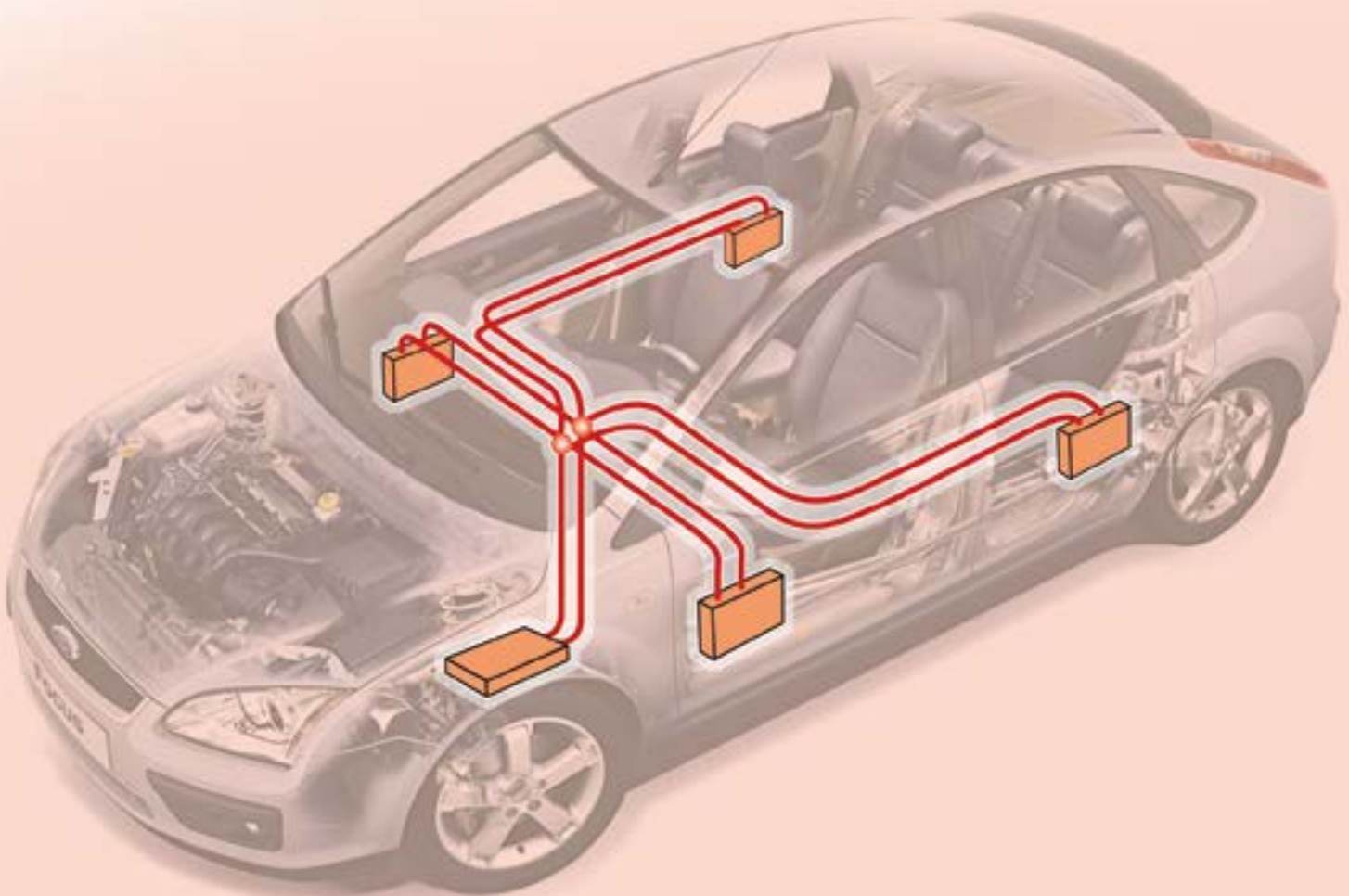


Allows component verification.



AUXILIARY ELECTRICAL SYSTEMS

- Genuine removable components
- Multiplex CAN-BUS network
- Lighting and signalling system
- Door control system
- Electronic window control
- Windscreen wiper system
- Ultrasound parking sensors
- Rain and automatic light sensor
- Instrument panel
- Diagnosis
- Simulation and repair of breakdowns



Allows making adjustment to the head-lights and anti-fog lights.



Fuse and relay box (GEM module).



Ultrasound parking sensors.

