MSAS02

LIGHTING TRAINING BOARD

https://autoedu.lt/

https://bads.lt/

https://automotivetrainingequipment.com/

2023 Kaunas Lithuania

CONTENTS

1. SAFETY REQUIREMENTS

Attention:

Before using the training board, take a look at the user manual.

Training equipment may only be used for the training purposes specified in the instructions.

The staff conducting the training (lecturer, teacher, instructor and others) must be familiar with the instructions for the training equipment, know the methods and principles of use, settings, control of the equipment, be able to switch off (stop) the training equipment in an emergency.

The training staff (lecturer, teacher, instructor and others) acquaint those working and learning with the training equipment with the work safety requirements.

It is forbidden to work with educational equipment for children, unqualified staff.

It is forbidden to work with training equipment for persons under the influence of alcohol or other psychotropic substances.

It is prohibited to improve, modify or otherwise change the design of training equipment without the written consent of the manufacturer.

Do not ignore the information on possible dangers provided by the warning signs on the training equipment. Beware of the hazards indicated on the warning signs.

The training equipment must be switched off completely during cleaning work.

It is forbidden to wash the training equipment with running water or any chemical cleaning agents.

It is forbidden to clean the electronic components of the training equipment with damp cloths.

The equipment must be completely switched off during maintenance and repair work on the training equipment.

It is forbidden to disconnect the power cords of the electrical elements of the training equipment. Careless or repeated disconnection of these wires will result in damage to the connectors and loss of contact. The desired electrical measurements can be performed at specially designed and installed banana-type connectors in the training equipment. Banana type connectors are resistant to multiple joints.

Before working with training equipment, check that:

- Equipment is not mechanically damaged, broken;
- All protective shields are assembled;
- All heated, rotating parts (e.g., heating plugs, pulleys, gears, etc.) are covered;
- All components (e.g., wires, jumpers, fuses, handles, etc.) are available;
- The equipment components are free of foreign bodies;
- Undamaged power cords;
- Neat power supplies (battery or stand power supply);
- Power supplies are properly connected (e.g., battery terminals are screwed on, polarity is not mixed, proper power supply is used according to local electrical installation standards);
- The training equipment is properly constructed and locked (e.g., the equipment is placed on a sufficiently solid base, the transport wheels are locked);
- During operation, the equipment will not pose any danger to those working with it and the surrounding staff;
- There are other factors not specified in the instructions that may endanger the health of personnel working with the equipment and others.

Observe during work with the equipment:

- The noise emitted by the equipment is characteristic of such a work process (no extraneous sounds);
- Odour of glowing, burning objects;
- Power supplies are working properly;
- There are no factors or processes other than those specified in the instructions that could endanger the health of personnel working with the equipment or other persons.

2. GENERAL INFORMATION

2.1. Purpose of training equipment

Teaching equipment for educational activities. It is a visual tool for explaining and demonstrating the structure and operation of various automotive parts, assemblies, structures, systems. The equipment is used as a teaching and learning tool for monitoring and analysis of various car systems work processes. It is possible to perform various measurements of the system parameters installed in the training equipment, to perform fault simulations, to diagnose. A variety of laboratory tasks can be performed using the training equipment. The equipment is designed and manufactured in order to provide learners with the clearest and most convenient information about the structure of the unit, the composition of the system and the principle of operation.

The training equipment is intended to introduce and demonstrate the operation, construction and principle of operation, settings and regulation of the car's signalling and lighting systems.

2.2. Training equipment parameters

Length	1360 mm;
Width	500 mm;
Height	1820 mm;
Weight	63 kg;
Power supply	12 V battery.

2.3. Transport and storage conditions

Training equipment is installed in a dedicated box. Do not overturn or lay the equipment during transport. During transport, the equipment must be protected from falling, tipping, shocks, humidity, temperature, vibration.

Put the training equipment only on a suitable, solid base (table, cupboard).

Export or import procedures must take into account the legislation in force between the countries. Import export procedures and various taxes apply to various technical fluids, oils, batteries, tires and more.

Training equipment must be stored in a room with a minimum ambient temperature of at least +10 ° C. Relative humidity not more than 60 %.

Training equipment must not be exposed to direct sunlight. Equipment must be covered by protective equipment if it is stored in a place exposed to direct sunlight.

Unused training equipment is kept completely switched off. The training stands are switched off with the control key and by disconnecting the power supply.

It is necessary to take care and regularly charge the battery of 12 V batteries.

2.4. Preparation and use of equipment

The training equipment is maintained as conventional mechanical, electrical machines and systems. Training equipment requires minimal maintenance and service.

All components of the training equipment must be controlled and ensured.

Damaged, broken parts, blown fuses, damaged connecting cables and other parts are replaced with new ones.

The technical condition of the equipment, attachment of protective shields, complete set and other things are checked. For more information on safe work requirements, see the section "Safety requirements → Before working with the training equipment, check that: and Observe during work with the equipment:".

The position of the emergency stop switch is checked. If the training equipment has been stopped in an emergency, the emergency stop switch will remain depressed and the equipment will not start. When the emergency stop switch is unlocked, it pops out when its upper part is turned clockwise (the upper part moves to the right).

If the emergency stop switch needs to be used, it is pressed with your finger or palm. There is no need to turn anything.

The training equipment is activated by ignition key.

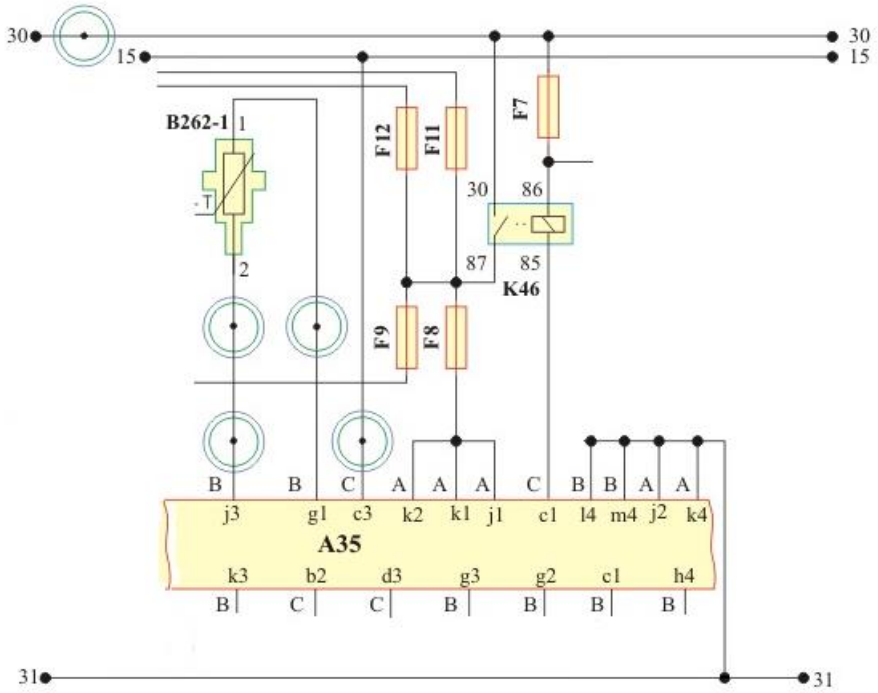
In training equipment with an in-car dashboard, all indications of equipment operation are reflected on the dashboard.

The training equipment is intended for study and demonstration of the design, operation of the car's signalling and lighting system. The systems installed in the equipment are fully operational.

With the help of system scanners, written fault codes / messages can be found in the car's control computer memory. These codes / messages are stored in the memory when the sensor, the actuator, the wire is broken, the contacts are lost, the jumper is removed from the circuit. All fault codes can be deleted from the car's control computer memory using system scanners. Fault codes are stored in the memory, for example: when the jumper is disconnected when the training equipment is switched on, the signals of the speed sensors do not match, due to voltage fluctuations and other real or simulated malfunctions. As in cars, errors can only be cleared from the control computer's memory when the fault has been physically rectified (e.g., jumper inserted, cable connected, faulty sensor replaced, etc.).

2.5. Symbols and markings

Automotive symbols for marking wiring diagrams and components are used in the training equipment. The figure below shows an example of component marking in a wiring diagram.



Example of wiring diagram and component marking.

Marking of wiring diagrams:

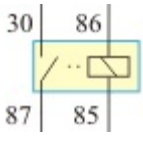
Black line connecting wires;

the wires are connected to each other;

30 a numbered wire is an electrical circuit having a constant voltage of +12 V from a battery;

15 the numbered wire is an electrical circuit in which a +12 V DC voltage is turned on by the ignition key;

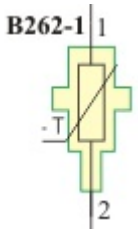
31 is the electrical circuit connected to the car body and the negative terminal of the battery (ground ⏚);



4-pin relay. Numbers 86 and 85 denote the contact numbers on the relay through which the relay electromagnet connecting contacts 30 and 87 is controlled. Numbers 30 and 87 denote contact numbers through which a current of 30 A (or greater) may be transmitted;

Fuse. Fuse marking symbol. In the circuit it is an F7 fuse.

A35 vehicle system (unit) control unit (computer) (e.g., engine control unit, airbag control unit, brake ABS control control unit or other). The letters A, B, C denote the connection used to connect the electrical wiring to the control computer. The symbols g1, c3, k2, b2, d3 denote the contact of the control unit connector.



B262-1 Temperature Sensor 1. Numbers 1, 2 temperature sensors contact numbers.

A 4 (2) mm banana was installed in the training equipment and connected to that cable. connector (socket) for connecting measuring equipment or a jumper.

Two banana connectors (sockets) are mounted on the cable for connecting the jumper. A jumper removed from the connectors breaks the circuit of this wire. Electric current cannot flow. The wiring diagram of the stand does not show this disconnection of the cord, because in real cars banana connectors are not installed. These connections are installed in the electrical circuit of the training equipment, enabling measurements to be made and faults to be simulated.

Jumper. Connector with banana type 4 mm contacts (plugs) at the bottom and one banana type 4 mm contact (socket) at the top. All three contacts inside the jumper are connected to each other.

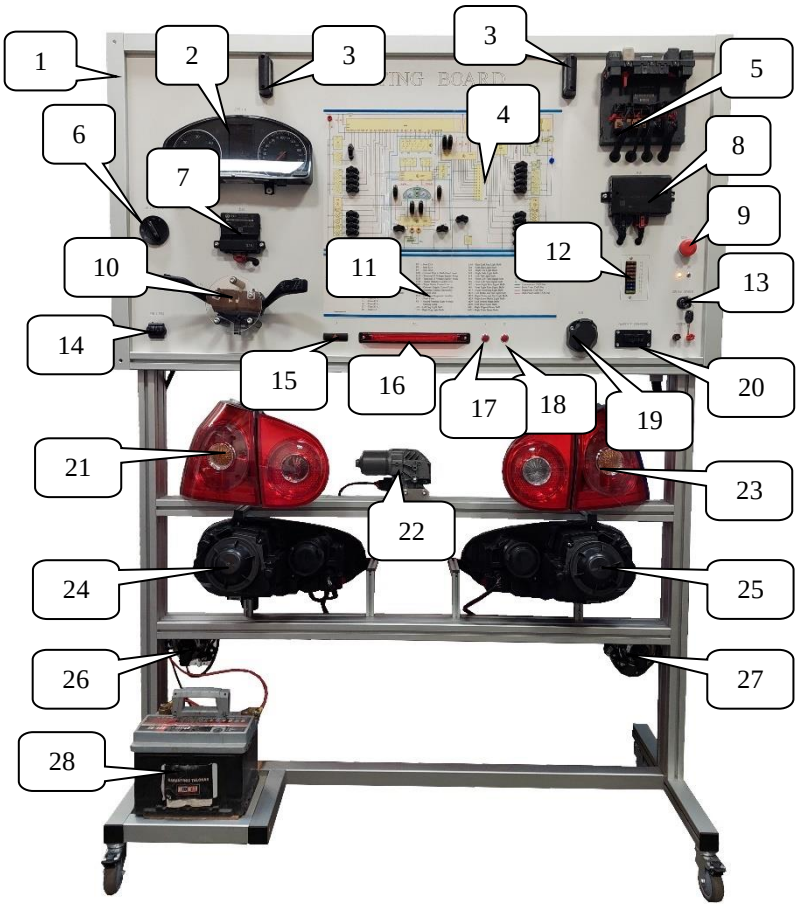
Attention:

It is recommended to connect measuring wires with 4 mm banana type contacts (plugs) to the training equipment when performing various measurements of electrical parameters.

3. TRAINING EQUIPMENT

3.1. General overview of training equipment

A general view and structure of the training equipment is given in the illustrations below.

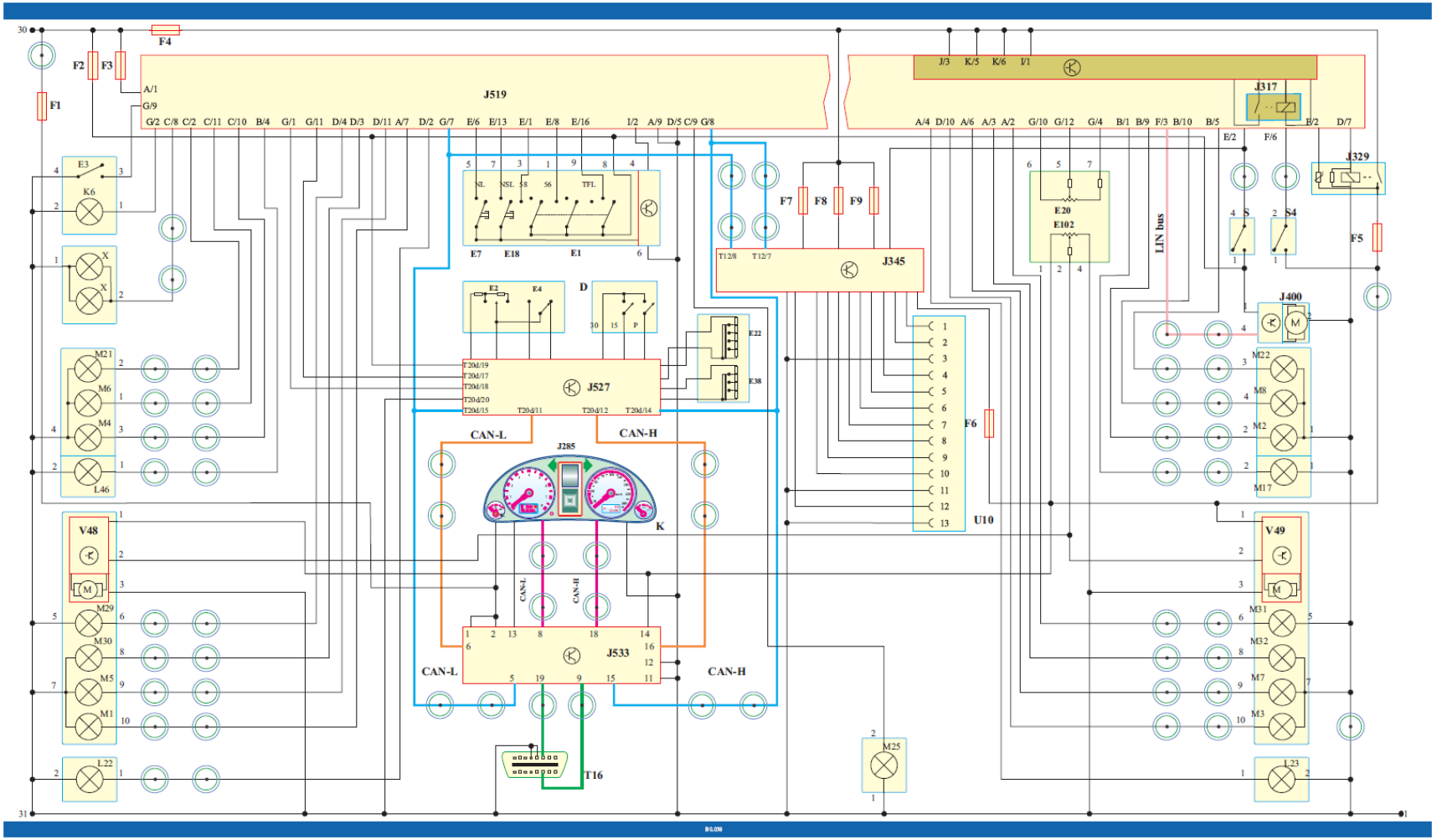


Training equipment

1. Frame
2. Dash panel
3. Licence plate light
4. Wiring diagram
5. Onboard supply control unit
6. Light switch
7. Data bus diagnostic interface
8. Trailer detector control unit
9. STOP button
10. Light, turn light and wiper control switches
11. Legend
12. Fuses
13. Ignition switch
14. Illumination regulator and Headlight range control regulator
15. Hazard warning light switch
16. High-level brake light
17. Brake light switch
18. Reversing light switch
19. Trailer socket
20. Diagnostic connector
21. Rear left lamp
22. Wiper
23. Rear right lamp
24. Front left lamp
25. Front right lamp
26. Front left fog lamp
27. Front right fog lamp
28. 12 V Battery

3.2. Wiring diagram

The wiring diagram contains all the elements: sensors, actuator components, data transmission lines, diagnostic connection. This diagram shows the connection circuits of the elements, the connection contact numbers, the component numbers, the mounting locations of the jumpers.



Wiring diagram

Legend

D – Ignition Switch
E1 – Light Switch
E2 – Turn Signal Switch
E3 – Hazard Warning Light Switch
E4 – Headlight dipper/flasher Switch
E7 – Fog Light Switch
E18 – Rear Fog Light Switch
E20 – Illumination Regulator
E22 – Intermittent Wiper Switch
E38 – Intermittent Wiper Regulator
E102 – Headlight Range Control Regulator
F1 – Fuse 10 A
F2 – Fuse 20 A
F3 – Fuse 40 A
F4 – Fuse 40 A
F5 – Fuse 20 A
F6 – Fuse 5 A
F7 – Fuse 15 A
F8 – Fuse 15 A
F9 – Fuse 20 A
J285 – Control Unit in Dash Panel Insert
J317 – Terminal 30 Voltage Supply Relay
J329 – Terminal 15 Voltage Supply Relay
J345 – Trailer Detector Control Unit
J400 – Wiper Motor Control Unit
J519 – Onboard Supply Control Unit
J527 – Steering Column Electronics Control Unit
J533 – Data Bus Diagnostic Interface
K – Dash Panel
K6 – Hazard Warning Light System Warning Lamp
L22 – Left Fog Light Bulb
L23 – Right Fog Light Bulb
L46 – Rear Left Fog Light Bulb
M1 – Left Side Light Bulb
M2 – Right Tail Light Bulb
M3 – Right Side Light Bulb
M4 – Left Tail Light Bulb
M5 – Front Left Turn Signal Bulb
M6 – Rear Left Turn Signal Bulb
M7 – Front Right Turn Signal Bulb
M8 – Rear Right Turn Signal Bulb
M17 – Right Reversing Light Bulb
M21 – Left Brake and Tail Light Bulb
M22 – Right Brake and Tail Light Bulb
M25 – High-Level Brake Light Bulb
M29 – Left Dipped Beam Bulb
M30 – Left Main Beam Bulb
M31 – Right Dipped Beam Bulb
M32 – Right Main Beam Bulb

S – Brake Light Switch
S4 – Reversing Light Switch
T16 – Diagnostic Connector
U10 – Trailer socket
V48 – Left headlight range ctrl. motor
V49 – Right headlight range ctrl. motor
X – Licence Plate Light

4. WORKING WITH EDUCATIONAL EQUIPMENT

The educational stand of car lights and signalling devices works and is controlled in the same way as car lighting equipment. To make it convenient to work and carry out the training process, light and signal devices are installed in a metal frame with transport wheels. All the control buttons are installed here, the electrical diagram with the legend is presented. The schematic contains jumpers and electrical contacts for measuring and monitoring the operating parameters of various components. After removing the jumpers, it is possible to simulate faults and observe changes in the operation of the lighting system. By connecting a scanner to the OBD II diagnostic connector, it is possible to monitor live parameters, read and clear errors.

5. WARRANTY CONDITIONS

Our products meet modern technical standards. We guarantee that our product is perfectly constructed and manufactured. They operate reliably if used correctly and in accordance with the provided maintenance rules.

Educational training board is used for educational purposes and can be used only with the components and operating fluids that are fitted on the board.

The guarantee of ____ months is provided for the educational training board. The guarantee begins to run from the sale date of the stand.

In order to warrant the setting of the appropriate date of sale, we ask the buyer to save the relevant contract documents: purchase check, invoice, transfer-acceptance act, warranty card with a product name filled correctly and clearly, number, date of sale, store stamp, signature and the signature of the seller.

The warranty is not applied:

- if the user did not comply with the usage, transportation and storage conditions, used not appropriate operating fluids and aggressive cleaning agents;
- if the stand was damaged by the third parties, force majeure (fire, catastrophe etc.) or another side effect;
- for mechanical breakings and other breaches;
- for warn out parts of the stand, fuses and if non-original spare parts are used;
- when the stand is regulated, improved or remade by unauthorized persons who cannot carry out this work;
- for naturally worn parts such as collars, straps and filters;
- in case of the fluid spill;
- when using the incomplete kit;
- if extraneous objects or some water gets into the product;
- when operating incorrectly or plugging into a messy electric network.

Warranty conditions do not cover the costs related with dismantlement of the product and transportation to the authorized warranty service enterprise. Also, it does not cover consultation, actuation and adjustment work costs. If the elements necessary for repairing the board have to be ordered from the supplier, the repair work may be prolonged.

Warranty repair is done at technical service stations authorized by the manufacturer. During the warranty period defective product components are repaired or replaced free of charge. Technical service station has the right to make a decision about the repair or replacement of the components. The elements that are being changed become the property of the service station.

After completion of the warranty repairs, the guarantee is not extended but remains valid until the time limit provided. The manufacturer reserves the right to change the appearance, design and structure of the product. Service center has the right to suspend the guarantee if the stand was used for other purposes.

Warranty maintenance coupon

Name	_____
Product number	
Date of sale	
Training equipment owner	_____
Trading partner / representative	_____

Description of work performed

Data	Description of the fault and its elimination process	Technician / Signature
	_____ _____ _____ _____ _____	
	_____ _____ _____ _____ _____	
	_____ _____ _____ _____ _____	
	_____ _____ _____ _____ _____	
	_____ _____ _____ _____ _____	

NOTES

CONTACTS

Auto EDU, UAB

Ateities str. 30 G, Kaunas,
LT – 52163, Lithuania

Tel.: +370 – 37 337842
Fax: +370 – 37 337842

Email: info@autoedu.lt

www.automotivetrainingequipment.com