AUTOEDU
Automotive technical education equipment

MSCAN1

CAN BUS
Training Board

https://autoedu.lt/

https://bads.lt/

https://automotivetrainingequipment.com/

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CONTENTS

1. SAFETY REQUIREMENTS

Attention:

Read the training equipment manual before beginning any work on the equipment.

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

The staff conducting the training (teacher, 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 requirements of work safety.

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

Do not ignore the information on potential hazards provided by the warning signs on the training equipment.

Beware of the dangers 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.

Before working with the training equipment, check that:

- Equipment is not mechanically damaged or broken;
- All protective shields are assembled;
- 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 equipment will not pose any danger to operating personnel during operation;
- There are other factors not specified in the instructions that may endanger the health of personnel working with the equipment and others.

When working with the equipment, make sure that:

- Does not smell 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 or other persons working with the equipment.

2. GENERAL INFORMATION

2.1. Purpose of training equipment

Training equipment for educational activities. It is a visual aid for the interpretation and demonstration of the structure and operation of various automotive parts, assemblies, structures, systems. The equipment is used as a teaching and learning tool for monitoring and analysing the work processes of various car systems. It is possible to perform various measurements of the parameters of the ongoing processes installed in the training equipment. 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 for teaching and learning the design and operation of the car CAN bus GATEWAY 2.0, the principle of operation.

2.2. Training equipment parameters

Length	1360 mm;
Width	500 mm;
Height	1820 mm;
Weight	~ 60 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.

Training equipment with its own chassis must be equipped with locked transport wheels during training and storage (including transport). The wheels can only be unlocked when the training equipment is relocated.

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.

2.4. Preparation and use of equipment

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

It is necessary to constantly monitor the leakage of fluids from the training equipment units.

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.

In the case of training equipment with internal combustion engines, gearboxes and air-conditioning systems, maintenance and service shall be carried out in accordance with the vehicle used in the training equipment.

Only technical fluids of the appropriate quality and technical specification (engine, transmission oil, coolant, brake fluid, etc.), quality filters and other spare and component parts must be used for maintenance and service work on the training equipment.

2.5. Preparation and use of equipment

When preparing training equipment for work, it must be properly constructed and secured. Equipment with its own stand or chassis is built on a level and solid floor. The equipment transport wheels are locked by locking the brakes.

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 "Occupational safety → Before working with the training equipment, check that:".

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).

A charged 12 V battery is connected before working with the training equipment.

Emergency stop switch and ignition key

If the emergency stop switch needs to be used, it is pressed with your finger or the palm of your hand. No need to turn.

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.

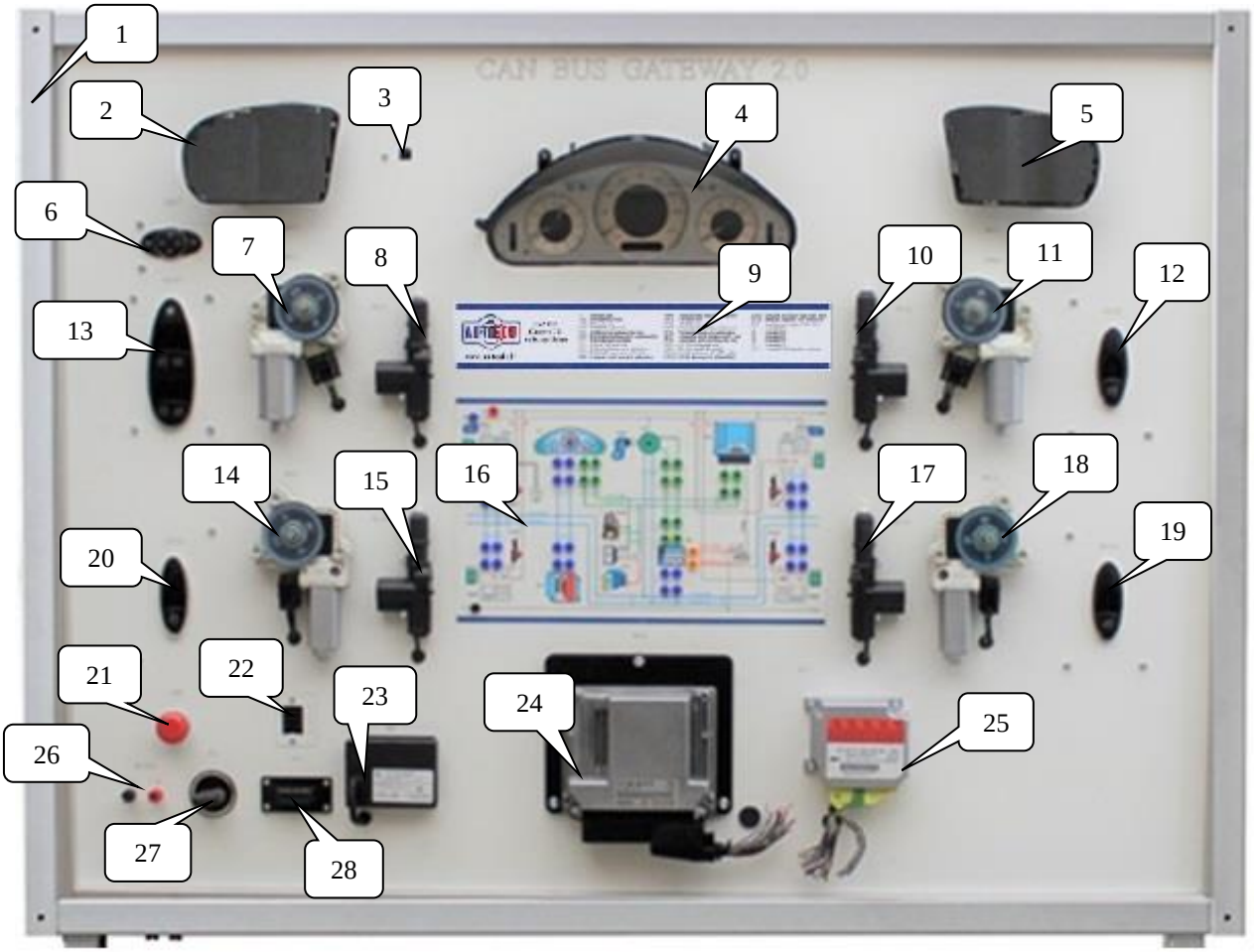
CAN bus training stand

The stand is made using the base of the car Mercedes Benz E 211.

When working with the stand, it is possible to control the central locking system, side window lifting and lowering mechanisms, make adjustments to the side mirrors, monitor and measure the signals circulating on the CAN bus, simulate faults.

Note:

The window closing mechanisms do not stop in their end positions. There are no real car door glasses on the stand, so the mechanisms idle without much resistance. Without resistance, the load does not increase when the window glass reaches the end position. So, the window closing - opening mechanism rotates all the time until it is turned off.



Training board components

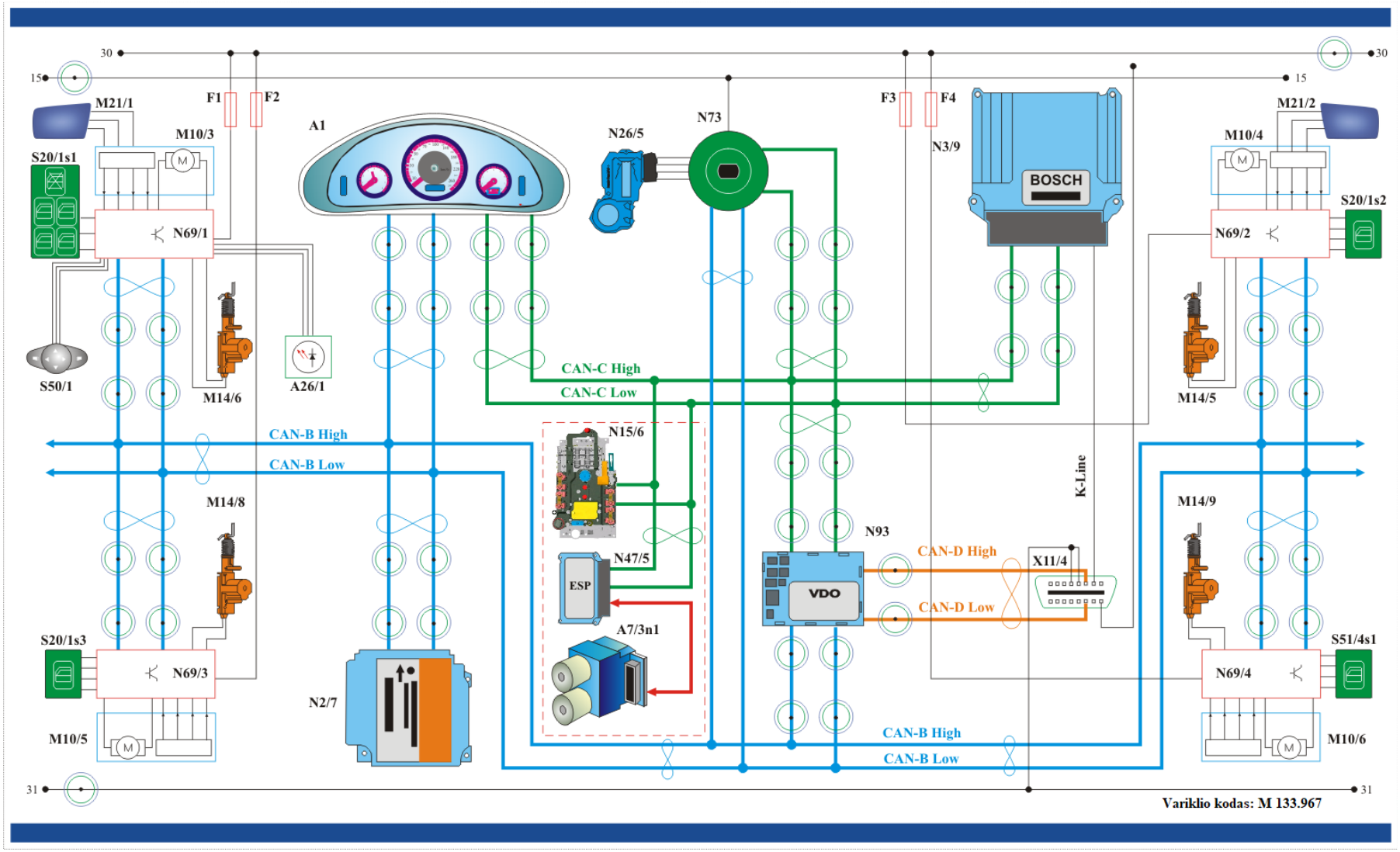
1 Stand frame;
2 Left side mirror;
3 IR receiver;
4 Dashboard;
5 Right side mirror;
6 Mirror control switch;
7 Left side front window control motor;
8 Central locking motor;
9 Legend;
10 Central locking motor;
11 Right side front window control motor;
12 Right side window control switches;
13 Left side window control switches;

14 Left side rear window control motor;
15 Central locking motor;
16 Wiring diagram;
17 Central locking motor;
18 Right rear window control motor;
19 Right side window control switches;
20 Left rear window control switches;
21 STOP switch
22 Fuse box;
23 CAN controller;
24 Engine control unit;
25 Airbag control unit;
26 Additional 12 V contacts;
27 Ignition lock;
28 OBD II Diagnostic Connector;

3.2. Wiring diagram

The wiring diagram is attached to the stand. All the main elements are listed here: sensors, execution components, diagnostic connection. The schematic of the elements, the component numbers and the values of the component numbers (legend) can be seen in this diagram.

The connectors have two contacts that connect the circuit. The third connector contact is for connecting measuring instruments. The wiring is equipped with open contacts for connecting measuring instruments and monitoring signals. E.g., contact 30 (red) steady battery plus. Contact 31 (black) - Mass, constant minus of the battery. 15-pin (blue) battery plus that occurs when the ignition key is turned to the on position.



Wiring diagram of the CAN BUS

Coding of components of the training circuit wiring diagram

A1 – Dashboard;
A26/1 – IR receiver;
A7/3n1 – Sensotronic brake system control computer;
N3/9 – Engine control unit;
N2/7 – Safety system control unit;
N26/5 – Electronic steering wheel lock;
N73 – Ignition lock;
N93 – Main CAN bus control unit;
N69/1 – Left side front door control unit;
N69/2 – Right side front door control unit;
N69/3 – Left side rear door control unit;
N69/4 – Right side rear door control unit;
N47/5 – ESP control unit;
N15/6 – Gearbox control unit;
M10/3 – Left side front door window motor;
M10/4 – Right side front door window motor;
M10/5 – Left side rear door window motor;
M10/6 – Right side rear door window motor;
M14/5 ... M14/9 – Central locking drives;
M21/1 ... M21/2 – Rear mirrors;
S20/1s1 – Left side window control switch;
S20/1s2 – Right side window control switch;
S20/1s3 – Left side rear window control switch;
S51/4s1 – Right side rear window control switch;
S50/1 – Control switch for side-view mirrors;
F1 – Fuse 20 A;
F2 – Fuse 20 A;
F3 – Fuse 20 A;
F4 – Fuse 20 A;
X11 / 4 – OBD II Diagnostic Connector.

4. 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

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