

AHPLIN03

HYBRID PLUG-IN FUNCTIONAL MODEL TOYOTA PRIUS III

https://autoedu.lt/

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ATTENTION:

REGISTRATION BY GOVERNMENT AUTHORITIES AND USE OF THIS TRAINING EQUIPMENT ON PUBLIC TRAFFIC IS PROHIBITED.

THE TRAINING EQUIPMENT CAN ONLY BE USED IN CLOSED AND DRY ROOMS.

IN THE TRAINING EQUIPMENT THE FRONT AIRBAGS ARE DISASSEMBLED. THEY WILL NOT WORK IN ANY SITUATION.

CONTENTS

1. Safety requirements	5
1.1. General safety requirements	5
1.2. Safety requirements for working with electric and hybrid training equipment	6
2. General information	,11
2.1. Purpose of training equipment	, 11
2.2. Training equipment parameters	, 11
2.3. Transport and storage conditions	, 11
2.4. Preparation and use of equipment	.12
3. Training equipment	.14
3.1. General overview of training equipment	. 14
3.2. Wiring diagram	.16
4. Fault simulator	.22
5. Warranty conditions	.30
Warranty maintenance coupon	.31
Notes	.32
Annex	.33
Contacts	.38

1. SAFETY REQUIREMENTS

1.1. General safety requirements

Attention:

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

Familiarize yourself with the Toyota Prius III 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.

When working with high voltage systems (hybrid power plants and electric vehicles), it is mandatory to comply with electrical safety requirements and use personal protective equipment against electric shock.

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 for people who do not have the appropriate qualifications to open the electrical input boxes, connect or change anything there.

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;

- Sufficient technical fluids (e.g., brake fluid, oil, coolant, etc.);

- Liquids do not leak through the joints;

- 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 use of training equipment with internal combustion engines ensures the removal of burns from the auditorium;

- 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 removal of incinerators from the auditorium is smooth and uninterrupted;

- The noise emitted by the equipment is characteristic of such a work process (no extraneous sounds);

- No leakage of liquids from the equipment;

- The exhaust gas extraction system is working properly;

- Sufficient quantity of technical fluids;

- 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.

1.2. Safety requirements for working with electric and hybrid training equipment

Employees, lecturers, students, support and service personnel must be familiar with the requirements of the work instructions for work with electrical devices after listening to the instructions and must sign the work safety logs. Instruction of employees and other personnel is carried out in accordance with the normative legal acts, laws and by-laws in force in that state (country). The "Safety Regulations for the Operation of Electrical Equipment" are followed.

Only persons with appropriate qualifications may work with high-voltage components and circuits of electric vehicles.

Elements marked in orange (wires, connectors, control units, voltage converters, etc.) are constantly or periodically exposed to high voltages.

Follow the rules for safe work when operating cars.

The high voltage system can turn on automatically. Before starting work on the stand, it is necessary to make sure that the air conditioning control timer is not set.

Warning:

• Before inspecting or servicing the circuits and components of the high voltage system, be sure to remove the maintenance connector (fuse) from the socket in the battery box of the high voltage battery. This will turn off the high voltage circuit.

• Place the maintenance connection (fuse) safely out of the reach of other persons to prevent it from being accidentally connected by another person during maintenance and service work.

• Before working on high voltage components, take care of personal protective equipment and equipment: gloves, shoes, face shield, rubber mat, earthing circuit, etc.

• Take care of the safety of the work area around the high-voltage battery: the work area must be marked, a responsible employee must be appointed, and the work area must be fenced. When work is not in progress, high-voltage parts and components must be covered with insulating covers or shields to prevent them from touching them.

CAUTION: HIGH VOLTAGE. DO NOT TOUCH DURING OPERATION.

To draw the attention of other employees, set up an information warning sign.

OPERATION NOT TOUCH DURING HIGH VOLTAGE. DO

CAUTION:

CAUTION:

HIGH VOLTAGE. DO NOT TOUCH DURING OPERATION The table must be printed, folded into a triangle (the bends are marked with a dotted line) and placed on the car.

Hybrid cars may not make any noise. The absence of noise does not mean that the car is switched off.

Always disconnect the negative terminal of the 12 V battery if necessary.

High voltage battery, connected with high voltage (marked in orange) wires to voltage converter, electric motor / generator, air conditioner pump. High voltage wires, regardless of their polarity, have orange insulation.

The high voltage battery is protected by a fuse. Voltage switching on and off is control

Attention:

There may be residual voltage in the high voltage circuit after it has been switched off. Therefore, wait at least 10 minutes after switching off the system. During this time, it is forbidden to touch, disconnect, repair or inspect high-voltage wires.

Both positive and negative high voltage wires are separated from the car body. Therefore, there is no possibility of electric shock when touching the metal parts of the car.

The high voltage battery is disconnected as soon as the SRS (Supplemental Restraint System) is activated in the event of a car accident. This prevents high voltage leakage into the car body.

When working with high voltage components, the battery must use protective equipment:

- glasses
- face shield
- rubber, latex gloves;
- protective clothing and apron;
- rubber boots:
- rubber mats.

All protective and working equipment must meet the requirements of electrical safety standards, be metrologically inspected and have valid metrological inspection documents.

When preparing to work with a hybrid car, it is necessary to turn off the car by removing the negative terminal of the car's 12 V battery. Using protective equipment (gloves, work clothes, shoes, goggles, mats, etc.) disconnect the high voltage service connector (fuse): unlock the lever lock, lift the lever up and pull the entire service connector out of the socket.

When disconnecting high-voltage wires or other electrical connections, it is mandatory to insulate the open contacts with insulating materials.

After disconnecting the electrical components, make sure that there is no residual voltage.

Protective equipment must be used when working with high voltage circuits. Measure the voltage inside the electrical components before working on them. The devices must display 0 V. It is only possible to work with high-voltage circuit elements at least 10 minutes after the circuit has been switched off. There are capacitors in the system that need to be discharged (discharged).

The SRS system may still operate 90 seconds after disconnecting the battery. The system must be handled with care to avoid possible injuries due to operation of the SRS system components.

Attention!

Work safety instructions must be observed when working with high voltage circuits. Workers working on high-voltage circuits can be shocked by high-voltage electricity and injured by improper handling of measuring and repair equipment due to sparks. At the beginning of the work, it must be ensured that all repair and maintenance work is carried out only with the highvoltage lines disconnected.

When disconnecting high voltage cables, they must be insulated. This avoids short circuits, self-coupling and human protection. Use only fully insulated tools for this purpose.

Attention:

In hybrid car stands, the internal combustion engine can start independently at any time as long as the POWER switch is on. Engine start is controlled and performed by the car's hybrid system control computer by estimating the charge level of the high-voltage battery. When working with hybrid car stands, it is mandatory to ensure that the flues are properly removed from the room and that there are no working persons or foreign objects near the rotating engine parts before switching on the POWER switch.

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 for demonstration, training and learning of the design, construction, principle of operation, settings and adjustments of the Toyota Prius III hybrid car.

2.2. Training equipment parameters

Length	4480 mm;
Width	1745 mm;
Height	1490 mm;
Weight	1420 kg;
Power supply	12 V battery
Production year	2012
High voltage battery 21,5 Ah, 207 V	
Gasoline A91 or higher	
Do not use gasoline containing more than 10 % ethanol	

2.3. Transport and storage conditions

The training equipment is mounted on a dedicated stand, frame, platform or chassis. When transporting equipment with an internal combustion engine or any other technical fluids, it is forbidden to overturn or lay down. 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 with protective equipment if the equipment is 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 (switching off the power supply and / or disconnecting the 12 V battery).

Stands with internal combustion engines and stands - cars are switched off with the control key. The key is removed from the lock. Such a stand is stored like a normal car. The battery (12 V) is not disconnected.

- The 12 V battery must be taken care of and charged regularly.

- The charge level of the high-voltage battery (hybrid cars and electric cars) must be taken into account. It must not be less than the minimum allowable voltage specified (specified) by the

The training equipment must be switched on and operated for at least 20 minutes within a period of 30 days. This is a preventative measure designed to reduce the chances of stalling and getting stuck in various components of the engine or car systems. It is not recommended to leave the training equipment unused for more than 2 months. period. If it is necessary to leave the equipment unused for more than two months, it must be properly prepared and preserved.

2.4. Preparation and use of equipment

Attention:

Equipment with internal combustion engines must be connected to a functioning exhaust gas removing system. The room must be well ventilated even when the exhaust gas removing system is operating.

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

Training equipment - a car, maintained and serviced according to the car manufacturer's recommendations.

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 airconditioning systems, maintenance and service shall be carried out in accordance with the technical requirements and conditions of the vehicle manufacturer 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.

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 \rightarrow Before working with the training equipment, check that: and Observe during work with the equipment:".

The engine oil and filter are changed once a year using the right quality parts and specifications.

In the case of equipment with internal combustion engines, the level of the engine oil and the coolant level must be constantly monitored.

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

On stands - cars, the engine oil level, coolant level, brake fluid level, clutch fluid level, gearbox oil level must be constantly monitored.

The drive element (chain or belt) of the gas distribution mechanism of an internal combustion engine shall be replaced according to the engine manufacturer's recommendations. The criterion is time.

In training equipment with pneumatic wheels, the air pressure in the tires is constantly monitored. If the air pressure in the wheel constantly decreases, leaks must be repaired - sealed.

The charge of the 12 V battery must be checked and monitored regularly. Strong battery discharge (voltage less than 10.5 V) is not permitted. Do not store a discharged battery for more than 10 days (lead acid batteries can cause irreversible sulphation processes that can damage the battery).

The battery charge level of high voltage (hybrid and electric) batteries must be checked regularly. The charge level must not be less than the minimum permissible battery voltage specified by the battery manufacturer. If necessary, the battery must be charged with the appropriate means and equipment.

Training equipment with internal combustion engines or equipment demonstrating the operation of car systems (systems: interior air conditioning, petrol or diesel engine power supply, ignition, etc.) must be switched on and operated for at least 20 minutes within a period of 30 days. This is a preventive measure designed to reduce the chances of stalling and getting stuck in various components of the engine or car systems.

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.

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.



Hybrid plug-in functional model



Engine Control Module (ECM) and Power Management Control ECU (PMC) breakout box

The breakout boxes are located in the car cabin. These boxes can be moved to different places inside the cabin, as far as its connecting cables allow.

When driving a car, the breakout boxes must be placed and fixed in such a way that it does not pose a danger to passengers in the cabin and does not interfere with the driver's control of the car.

Attention:

On Breakout Box it is possible to measure the electrical signals of the control units. Only multimeter / oscillograph set for VOLTAGE couplings can be used for measurements.

It is forbidden to measure currents, resistances.

It is forbidden to connect contacts by wire to each other.

Breakout box for use only in dry environments.

Keep the breakout box away from contact with liquids.

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 and other.



Attention: The A26 contact shown in the electrical diagram on page 9 is not present in the car.



Wiring diagram of PMC (1 side)

How to read the wiring diagrams:

ECM - Engine Control Module

Two connectors are connected to the engine control module. These connectors on different information sources are labelled differently:

- the first connector: A57 (A);
- the second connector: D28 (B).

By using the wiring diagrams, we recommend that you follow the inscriptions A and B. This will avoid confusion.



Electrical diagrams are provided in the attached supplementary documents.

PMC – Power Management Control ECU (ECU – Electronic Control Unit)

Four connectors are connected to the engine control module. These connectors on different information sources are labelled differently:

- the first connector: A21 (A);
- the second connector: A22 (B);
- the third connector L5 (C);
- the fourth connector L6 (D).

By using the wiring diagrams, we recommend that you follow the inscriptions A, B, C, D. This will avoid confusion.



Part of wiring diagram

Electrical diagrams are provided in the attached supplementary documents.

A21 (A) connector with 34 pins is shown in the wiring diagram on page 1 on the left side.



A22 (B) connector with 35 pins is shown in the wiring diagram on page 9 on top right side.





L5 (C) connector with 36 pins is shown in the wiring diagram on page 3 bottom.

L6 (D) connector with 31 pins is shown in the wiring diagram on page 9 on bottom right side.



4. FAULT SIMULATOR

In the instrument panel storage box is installed switches for making faults simulations on three different systems. On engine control module are ready 10 faults simulations, on power management control ECU are ready 10 faults simulations, and on high voltage system are ready 4 faults simulations.

When the switch is ON (position I), the systems work normally, without faults. When the switch is OFF (position O), faults are simulated in the systems.



Switches for faults simulations



Location of the hidden fault switch on wiring diagram

Depending on the capabilities of the diagnostic equipment used, there may be various options for scanning and removing (erasing) fault codes.

- Fault codes with diagnostic equipment can be erased immediately after the corresponding switch of the error simulation has been activated.
- Fault codes with diagnostic equipment can be deleted immediately after the fault simulation has been switched off. Rechecking the memory of the control unit with diagnostic equipment shows the fault codes again. These codes disappear from the memory of the control unit only after the car is completely turned off and on.
- Fault codes with diagnostic equipment can be deleted immediately after the fault simulation has been switched off. When repeatedly checking the control unit

memory with diagnostic equipment, no fault codes are displayed, but the display of the actual parameter value is restored only after disconnecting and connecting the 12 V battery.

Vehicle identification in the diagnostic equipment is carried out according to the WIN number or by specifying the following data: Toyota Prius III.

Simulated fault codes:

In the ECM – Engine Control Module

FAULT 1 (B106)
ACTUAL FAULT
Open circuit between ECM pin B106 (IGT3) and Ignition coil assembly No. 3 pin 3 (IGT3).
DTC DESCRIPTION
P0353 Ignition Coil "C" Primary / Secondary Circuit.

FAULT 2 (B36)

ACTUAL FAULT

Open circuit between ECM pin B36 (OC1+) and Camshaft timing oil control valve (Intake side) pin 1 (+).

DTC DESCRIPTION

P0010 Camshaft Position "A" Actuator Circuit (Bank1).

FAULT 3 (B64)

ACTUAL FAULT

Open circuit between ECM pin B64 (THW) and E.F.I Engine coolant temperature sensor pin 2 (THW).

DTC DESCRIPTION

P0118 Engine Coolant Temperature Circuit High Input.

FAULT 4 (B116)

ACTUAL FAULT

Open circuit between ECM pin B116 (THA) and Intake mass air flow meter pin 1 (THA).

DTC DESCRIPTION

P0113 Intake Air Temperature Circuit High Input.

FAULT 5 (B74)

ACTUAL FAULT

Open circuit between ECM pin B74 (NE+) and Crankshaft position sensor pin 1 (NE).

DTC DESCRIPTION

P0335 Crankshaft Position Sensor "A" Circuit.

FAULT 6 (B74/B120) ACTUAL FAULT Short circuit between ECM pin B74 (NE+) and pin B120 (NE-). DTC DESCRIPTION P0335 Crankshaft Position Sensor "A" Circuit.

FAULT 7 (B21)

ACTUAL FAULT

Open circuit between ECM pin B21 (M+) and Throttle body assembly pin 2 (M+).

DTC DESCRIPTION

P2102 Throttle Actuator Control Motor Circuit Low.

FAULT 8 (B18)

ACTUAL FAULT

Open circuit between ECM pin B18 (HA1A) and Air fuel ratio sensor (Bank 1, Sensor 1) pin 1 (HA1A).

DTC DESCRIPTION

P0031 Oxygen (A/F) Sensor Heater Control Circuit Low (Bank 1 Sensor 1).

FAULT 9 (B28)

ACTUAL FAULT

Open circuit between ECM pin B28 (PRG) and Purge VSV pin 1.

DTC DESCRIPTION

P0443 Evaporative Emission Control System Purge Control Valve Circuit.

FAULT 10 (B41)

ACTUAL FAULT

Open circuit between ECM pin B41 (HT1B) and Oxygen sensor (Blank 1, Sensor 2) pin 1 (HT1B).

DTC DESCRIPTION

P0037 Oxygen Sensor Heater Control Circuit Low (Bank 1 Sensor 2).

In the Power Management Control ECU (PMC) system

FAULT 1 (A13)

ACTUAL FAULT

Open circuit between PMC pin A13 (IWP) and Inverter water pump motor pin 3 (SWP).

DTC DESCRIPTION

P0C73 Motor Electronic Coolant Pump "A" Control Performance.

FAULT 2 (A24)

ACTUAL FAULT

Open circuit between PMC pin A24 (MMT) and Motor generator 2 pin 1 (MMGT).

DTC DESCRIPTION

POA2D Drive Motor "A" Temperature Sensor Circuit High.

FAULT 3 (A29)

ACTUAL FAULT

Open circuit between PMC pin A29 (SI0) and Battery cooling blower assembly pin 3 (SI0).

DTC DESCRIPTION

P0A84 Hybrid Battery Pack Cooling Fan 1 Control Circuit Low.

FAULT 4 (B2)

ACTUAL FAULT Open circuit between PMC pin B2 (IG2D) and IG2 Relay pin A2. DTC DESCRIPTION C2309 Open in B + Circuit C1242 Open Circuit in IG1 / IG2 Power Source Circuit U0100 Lost Communication with ECM / PCM "A" Other

Note:

To erase errors from the memory of the control unit, it is necessary to disconnect and reconnect the battery of the 12 V battery.

FAULT 5 (B6)
ACTUAL FAULT
Open circuit between PMC pin B6 (MREL) and IGCT Relay pin 1.
DTC DESCRIPTION
C2309 Open in B + Circuit
U0293 Lost Communication with Hybrid Vehicle Control system
Other

Note:

To erase errors from the memory of the control unit, it is necessary to disconnect and reconnect the battery of the 12 V battery.

FAULT 6 (B26)

ACTUAL FAULT

Open circuit between PMC pin B26 (VPA1) and Accelerator pedal sensor assembly pin 6 (VPA1).

DTC DESCRIPTION

P2122 Throttle / Pedal Position Sensor / Switch "D" Circuit Low Input.

FAULT 7 (C20)

ACTUAL FAULT

Open circuit between PMC pin C20 (VSX3) and Shift lever position sensor pin 4. DTC DESCRIPTION

P082B Gear Lever X Position Circuit Low.

FAULT 8 (C25)

ACTUAL FAULT

Open circuit between PMC pin C25 (VSX1) and Shift lever position sensor 2 pin 1.

DTC DESCRIPTION

P082F Gear Lever Y Position Circuit High.

FAULT 9 (C28)

ACTUAL FAULT

Open circuit between PMC pin C28 (THB) and HV battery thermometer pin 2. DTC DESCRIPTION

P0517 Battery Temperature Sensor Circuit High.

FAULT 10 (D25)

ACTUAL FAULT

Open circuit between PMC pin D25 (CA1H) and Computer data lines system. DTC DESCRIPTION

U0293 Lost Communication with Hybrid Vehicle Control System U0100 Lost Communication with EWCM / PCM "A"

U0151 Lost Communication with Restraints Control Module Other.

In the High Voltage (HV) system

FAULT 1 ACTUAL FAULT P0A0D High Voltage System Inter – Lock Circuit High C1259 HV Control System Regenerative Malfunction C1310 HV System Malfunction DTC DESCRIPTION

When the switch No. 1 (S1) is turned OFF, the circuit between PMC contact A32 and inverter with converter assembly contact A35 is interrupted. See the picture below.



FAULT 2 ACTUAL FAULT C1259 HV Control System Regenerative Malfunction C1310 HV System Malfunction DTC DESCRIPTION

When the switch No. 2 (S2) is turned on, the main relay on inverter with converter assembly is turned on. This is noticed by the control unit. See the picture below.

Note:

This error must be enabled before the ignition is turned on. Error activation after ignition activation no longer has an effect.



FAULT 3 ACTUAL FAULT P0AA6 Hybrid Battery Voltage System Isolation Fault

DTC DESCRIPTION

When the switch No. 3 (S3) is turned on, one cell of the high-voltage battery is connected to the ground of the car body through a resistance of 10 k ohms. See the picture below.



Note:

Wait about 1 minute until the control unit registers the fault.

FAULT 4 ACTUAL FAULT Only the charging station reports the failure.

DTC DESCRIPTION

When the switch No. 4 (S4) is turned on, one of the high voltage wires of the charging socket is connected to the ground of the car body through a resistance of 10 k ohms. See the picture below.



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	
		/ Signature

NOTES



ANNEX

It's important

Always check technical fluid specifications and quantities in the manufacturer's official information sources.

Vehicle identification	
No. of cylinders	Type 4/DOHC
Capacity (Fiscal)	cc 1798
Compression ratio	1:13
Suitable for unleaded petrol	Yes
Minimum octane rating	RON 95
Ignition system	Make Toyota
Ignition system	Description Map-DI
Trigger location	Cam/Crankshaft
Fuel system	Make Toyota
Fuel system	Description MFI-s
Air metering	Type Mass
Combined ignition and fuel ECM	Yes
Diagnostic socket	Yes
In the materia	
Firing order	1-3-4-2
Tuning and emissions	
Tuning conditions	
Ignition timing - basic BTDC	Engine/rpm 10±2/1000 Not adjustable
Ignition advance checks	Engine/rpm ECM Controlled
Idle speed	rpm 1000±50 Not adjustable
Oil temperature for CO test	°C 80
CO level at idle speed - tailpipe	Vol. % CO 0,2 Max Not adjustable
HC level at idle speed	ppm 100
CO2 level at idle speed	Vol. % CO ₂ 14,5-16
O2 level at idle speed	Vol. % O ₂ 0,1-0,5
Increased idle speed for CO test	rpm 2300-2700
CO content at increased idle speed	Vol. % 0,2
Lambda at increased idle	λ 0,97-1,03

Spark plugs	
Spark plugs	Original equipment Denso
Spark plug	Type SC20HR11
Electrode gap	mm 1,0-1,1
Spark plugs	Make NGK
Spark plug	Type ILKAR7B-11
Electrode gap	mm 1,0-1,1
Fuel system	
System pressure	Bar 3,0-3,4
Engine coolant temperature (ECT) sensor	Ohm/°C 2320-2590/20
Crankshaft position (CKP) sensor/engine speed (RPM) sensor	Ohm 1850-2450
Injector	Ohm 11,6-12,4
Lambda sensor (Oxygen) heater	Ohm 11,0-16,0
Throttle motor	Ohm 0,3-100
Service checks and adjustments	
Valve clearance -INLET	mm Hydraulic
Valve clearance -EXHAUST	mm Hydraulic
Compression pressure	Bar 8,1
Oil pressure	bar/rpm 1,4/2500
Radiator cap	Bar 0,79-1,22
Thermostat opens	°C 80-84
Lubricants and capacities Preferred engine oil	
Ambient temperature range	All temperatures
Engine oil grade	SAE 0W-20
Engine oil classification	API/ACEA SL/A1, A3
Engine oil options	
Ambient temperature range	All temperatures
Engine oil grade	SAE 5W-20, 5W-30
Engine oil classification	API/ACEA SL/A1, A3
Ambient temperature range	-18°C
Engine oil grade	SAE 10W-30
Engine oil classification	API/ACEA SL/A1, A3

Ambient temperature range	-12°C→
Engine oil grade	SAE 15W-40
Engine oil classification	API/ACEA SL/A1, A3
Ambient temperature range	-7°C→
Engine oil grade	SAE 20W-50
Engine oil classification	API/ACEA SL/A1, A3
Engine with filter(s)	litres 4,2
Other lubricants and capacities	
Automatic transmission fluid	Type ATF WS
Automatic transmission (drain & refill)	litres 3,4
Coolant	Type Super long life
Coolant	Colour Pink
Cooling system - total capacity	litres 7,2
Brake fluid	Type DOT 3
Tightening torques	
Cylinder head instructions	
Cylinder head	
	Maximum bolt length
	Tighten 24 Nm
	Tighten 49 Nm
	Tighten 90°
	Tighten 45°
Other engine tightening torques	
Main bearings	Renew bolts/nuts
Main bearings	Stage 1 40 Nm
Main bearings	Stage 2 90°
Big end bearings	Renew bolts/nuts
Big end bearings	Stage 1 20 Nm
Big end bearings	Stage 2 90°
Oil pump to cylinder block	21 Nm
Sump bolts	
Sump drains bolt	37 Nm
Flywheel/drive plate	49 Nm+90°
Crankshaft pulley/damper centre bolt	190 Nm

Camshaft sprocket/gear	54 Nm
Camshaft carrier/cap	
Camshaft/rocker cover	10 Nm
Inlet manifold to cylinder head	28 Nm
Exhaust manifold to cylinder head	21 Nm
Exhaust downpipe to manifold	43 Nm
Water pump	
Spark plugs	20 Nm
Fuel rail	21 Nm
Crankshaft position (CKP) sensor/engine speed (RPM) sensor	10 Nm
Camshaft position (CMP) sensor	10 Nm
Engine coolant temperature (ECT) sensor	20 Nm
Lambda sensor (Oxygen)	44 Nm
Knock sensor (KS)	20 Nm
Engine oil pressure switch	15 Nm
Oil filter	25 Nm
Chassis tightening torques	
Front hub	216 Nm
Front hub - wheel bearing housing bolts	40 Nm
Rear hub - wheel bearing housing bolts	90 Nm
Steering wheel	50 Nm
Steering rack/box mounting	138 Nm
Steering track rod end	49 Nm
Brake calliper to carrier	Front 34 Nm
Brake calliper/carrier to hub	Front 137 Nm
Brake calliper to carrier	Rear 34 Nm
Brake calliper/carrier to hub	Rear 57 Nm
ABS sensor	Front 9 Nm
Road wheels	103 Nm
Brake disc and drum dimensions	
Minimum disc thickness for replacement - ventilated	Front 22 mm
Minimum disc thickness for replacement	Rear 7,5 mm
Disc runout	Front 0,05 mm

Disc runout	Rear 0,15 mm
Minimum pad thickness	Front 1 mm
Minimum pad thickness	Rear 1 mm
Parking brake travel	No. of notches 8-11
Air conditioning	
No. of AC service connectors	2
Air conditioning restrictor type	Expansion valve
Compressor clutch/magnetic coupling	No
Compressor variable displacement solenoid	Yes
Air conditioning refrigerant	Type R134a
Air conditioning refrigerant quantity	grams 470±30
Air conditioning oil group	POE
Air conditioning oil	Type Dens Oil 11
Air conditioning oil viscosity	ISO 46

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