MOTOPLAT

USER MANUAL

VC-05 COM

Handheld Tester

The VC-05 COM alternator tester is a handheld, very useful and easy to use device, used by car garages, diagnostic stations, authorised service stations and rebuilders. The VC-05 allows you to diagnose an alternator (12V) that is communicating with the ECU of the car, even when it's still mounted or to be used in combination with all conventional test benches.

Specifications

- On-car testing
- Operates on conventional testers
- Touch screen
- User-friendly

ENGLISH VERSION 2020

www.motoplat.nl

IMPORTANT INFORMATION

Safety Warning

Electrical devices should be installed and operated in such a way that all applicable safety requirements are met. It is your responsibility as an installer to ensure that you identify the relevant safety standards and comply with them. Failure to do so may result in damage to equipment and personal injury. In particular, you should study the contents of this guide carefully before installing or operating the equipment.

People who start using this product should review carefully this instruction manual, or have had a training from a qualified person.

The use of electrical equipment is entirely at your own risk and Motoplat® is under no circumstances responsible for any incidental, consequential or special damages of any kind whatsoever, including but not limited to lost profits arising from or in any way connected with the use of the automated test equipment or this manual.

The tester should be connected to a properly grounded outlet.
If the power cable is damaged, you must have it be replaced by the supplier or by another qualified person in order to avoid dangerous situations.

Since this tester only operates in conjunction with other test equipment, you should also be aware of the installation, operation and safety requirements of the other equipment.

Environment

The tester should be installed in a weather protected area where heat, humidity or any other climate situation can not damage the tester.

The tester should be installed on a level surface that is clear of debris and obstructions.

- Motoplat® -

CONTENT

INTRODUCTION

Thank you for choosing a Motoplat Test Equipment product.

Motoplat VC-05 COM Tester for diagnostics of automotive alternators is made of high-quality components and material through the use of advanced techniques of diagnostic equipment manufacture.

The User Manual contains information concerning VC-05 COM usage, equipment set, design, function, technical characteristics and operation.

The Manufacturer reserves the right to change the design and software of the equipment without prior notice to users.

Read carefully User Manual before putting VC-05 COM (hereafter referred to as tester) into use. Take a special training at the equipment manufacturing facility if necessary.

1. APPLICATION

VC-05 COM Tester is designed to diagnose automotive alternators with a supply voltage of 12V in two ways:

- directly in the car;
- on the diagnostic test bench which provides its drive.

2. TECHNICAL CHARACTERISTICS

General	
Dimensions (L*W*H), mm	120×65×18
Weight, kg	0,3
Supply voltage, V	from 10 to 18
TFT-LCD Touch screen, color	2.8” screen size
Operating temperature, ˚C	from 0 to +40
Storage temperature, ˚C	from 0 to +40
Ingress protection rating	IP20
Alternator testing	
Types of tested alternators	«COM» («LIN», «BSS»), «SIG», «RLO», RVC» «C KOR.», «P-D», «C JAP.».
Tested parameters	- Stabilizing voltage For COM voltage regulators: - ID; - Protocol type - Exchange rate - Errors
Supply voltage of tested alternators, V	12
Polarity reversal protection	Yes
Short-circuit sound alert	No
Battery pack	No

3. EQUIPMENT SET

VC–05 COM Tester set includes:

- VC–05 COMTester – 1 pc.;
- Set of diagnostic cables:
  - Four-wire cable - 1 pc.;
  - Cable for connection of additional "+" - 1 pc.;
- User Manual – 1 pc.

Observe VC–05 COM Tester. If any damage is detected, please contact the manufacturer or sales representative before launching the equipment.

⚠ **WARNING! In case of obvious damage, the operation of the equipment is forbidden.**

4. DESCRIPTION

Fig.1. VC-05 COM Tester. General view.

The tester is a compact device supplied with a touch screen. A connector for diagnostic cable connection is located in the upper part of the tester (Fig. 2), a MicroSD connector for software updates - in its lower part (Fig. 3).

Fig. 2. Connector for diagnostic cable.

Fig. 3. MicroSD connector.

Two diagnostic cables are also included in the equipment set (Fig. 4, 5): a diagnostic cable and an auxiliary cable to connect an additional positive contact.

Fig. 4. Four-wire diagnostic cable.

The cable has the following marking:

"GC" (Yellow) is intended for connection to the alternator voltage control terminal.

"FR" (Green) is intended for connection to the alternator load control terminal.

"-" (Black) - "B-." Battery negative pole (the alternator housing).

"+" (Red) - "B+". Battery positive pole, the alternator output. Used to power the device when testing the alternator on the test bench or in the car; it is also used for “B+” voltage indication.

Fig. 5. Cable for connection of additional “+”.

4.1 Tester menu

The main menu consists conditionally of three sections (Fig. 6):

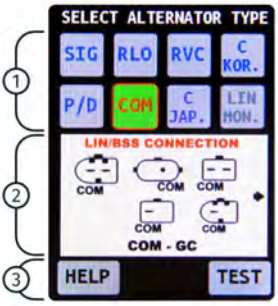

Fig. 6. Tester main menu.

1 – Selection of the alternator type. The alternator type can be selected by single-clicking on the corresponding icon. The selected type is being highlighted.

2 – Types of voltage regulator connectors are displayed as reference information.

3 – "HELP" and "TEST" buttons. Customer support contact information is displayed when the "HELP" button is pressed. Alternator testing mode is on when the "TEST" button is pressed.

4.2 Alternator testing modes

The following information is displayed when the testing mode for COM-type alternator is selected (Fig. 7):

Fig. 7. Diagnostic window of the "COM"-type alternator.

1) Type of the tested alternator;

2) "-V" and "+V" buttons are used to set the voltage on the voltage regulator, which is displayed as "set + numerical value". Each pressing of the button changes the value of preset voltage by 0.2V. The measured voltage is displayed in green below the preset voltage.

3) "COM PR.": voltage regulator protocol type. The following protocol titles appear on the display: LIN1.3 (displayed as LIN1), LIN2.0 (displayed as LIN2).

4) "ID": voltage regulator identification number. The manufacturer and the voltage regulator order number are encoded in it. The ID number should correspond to the original one, when mounting the voltage regulator on the car, otherwise the car will reject such a voltage regulator and the dashboard will display an error.

5) "COM SPEED": speed of data exchange between the voltage regulator and vehicle ECU. The following speed rates can be displayed in the "LIN" protocol:

• “L” – 2400 baud (low);

• “M” – 9600 baud (medium);

• “H” – 19200 baud (high).

6) “TYPE” - voltage regulator connection type. The following protocol types are displayed: “BSS” or one of the 12 types of “LIN” protocol: A1, A2, A3, A4, B1, B2, B3, B4, C3, D1, D2, E1.

7) "EXCITATION" – stator excitation level (load).

8) “ERROR” –voltage regulator operation errors. There are three types of potential errors:

• “EL” – electric error;

• “ME” – mechanic error;

• “TM” – thermal error.

When detected, the error is indicated in red.

9) “BACK” –diagnostic mode exit.

The following information will be displayed when the testing mode for one of the alternator types ("SIG", “RLO”, RVC”, “C KOR.”, “P/D”, “C JAP.”) is selected: (Fig. 8):

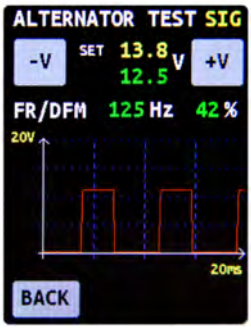

Fig. 8. Alternator diagnostic window when one of the following alternator types “SIG”, “RLO”, RVC”, “C KOR.”, “P/D”, “C JAP.” is selected.

1) Type of the tested alternator.

2) "-V" and "+V" buttons are used to set the voltage on the voltage regulator which is displayed as "set + numerical value". Each press of the button changes the voltage value by 0.2V. The measured voltage is displayed in green below the set voltage.

3) “FR” – Field response.

4) “DFM” – DFM – digital field monitor.

5). An oscilloscope is displayed on the screen and shows the measured signal and its waveform. The measured signal is displayed on two scales: 20 and 200ms. Single-click on the diagram to switch from one scale to another.

⚠ **WARNING! Contact the Motoplat support team in case you want to connect the type of alternator which is not on the list.**

5. INTENDED USAGE

1. The tester is intended for indoor use. When used outdoor, external conditions and technical characteristics of the device set out in item 2 of this manual, should be taken into consideration.

2. To avoid damage or failure of the tester, do not make any changes in the electrical diagram of the device. In case of failure, please contact Technical Support or a sales representative.

3. The device enables to test the alternator assembly either directly on the car or on the test bench, which provides its drive. Further on, the option of testing the alternator directly on a car will be looked into. Diagnostics with the test bench is performed quite the same way.

5.1 Safety measures

1. Only the personnel that has received special training in safety operation and been authorized to work with the particular equipment is allowed to use the device.

2. Make sure that measuring clamps do not have insulation damage or bare metal spots. Check the clamps for any breaks. In case of obvious damage, replace them with new ones before launching the device.

3. In order to avoid possible electric shock or injury as well as damage to the tester, do not apply voltage exceeding 20V to the device outputs (or between the earth and any of the outputs).

4. When measuring, try to connect outputs correctly, especially “B-“ones. The device has all kinds of protection against emergency situations, however not all voltage regulators have such a protection.

5.2 Testing of an alternator on a car

Testing of an alternator on a car is performed as follows:

1. Connect the tester to the automotive alternator. Observe the color marking in compliance with item 4.1 of the manual. To increase the accuracy of voltage measurement, the negative wire of the device should be connected directly to the appropriate battery terminal. The device is powered by the alternator battery. When the device is on, the main menu will be displayed.

2. For activation of the testing mode, select the appropriate terminal of the voltage regulator and press the "TEST" button.

2.1. When testing a COM-type alternator, wait for the device to identify its ID number and TYPE.

3. Start the car engine and reset the load. Wait until the engine operates steadily at idle.

⚠ **WARNING! Testing of the alternator on a car should be performed on premises equipped with combined extract and input ventilation or fume offtake system. Alternatively, all the measurements should be carried out outdoor.**

⚠ **WARNING! It is prohibited to exit the testing mode when the engine is running. Otherwise it will result in a sharp surge of voltage generated by the alternator.**

⚠ **WARNING! In case of spontaneous disconnection of the black ("B-", battery negative terminal) and/or red ("B+", battery positive terminal) clamp it is strictly prohibited to connect it again when the engine is running.**

4. Use "V-" and "V+" buttons to change the alternator voltage in the range between 13.2V and 14.8V. The measured voltage (displayed in green) should change in proportion to a possible deviation by +-0.2V.

5. Use "V-" and "V+" buttons to set any voltage in the range between 13.2V and 14.8V on the alternator. Increase the crankshaft rotation speed up to average rpm. In this case, the voltage value displayed on the device screen must not change (possible value fluctuations with a tolerance of +-2 V are the norm).

6. Without reducing the crankshaft speed, increase the load on the alternator by switching on headlights and other lighting units. The voltage value displayed on the device screen must not change (possible voltage reduction is by 0.3V).

7. Shut the engine off.

8. Disconnect the VC-05 COM tester terminals.

9. Failure of one of the operational requirements described in items 2.1, 4 – 6 of the manual, signs the alternator malfunction.

6. TESTER MAINTENANCE

MS015 COM is designed for a long-term operation 24/7. However, to ensure the test bench uptime, it is necessary to provide regular technical inspection and below described routine maintenance of the device.

Below are the main points that should be checked during a daily inspection:

• Environmental conditions for the tester operation (temperature, humidity, air pollution, vibration, etc.).

• Condition of the wires that should be connected to the device outputs (visual inspection).

• Do not store or use the device in places exposed to high temperature, humidity, danger of explosion or fire, strong magnetic field. Exposure to dampness may degrade the product's performance.

6.1 Tester software update

Update VC-05 COM software as follows:

- Download a new version of the software.
***File with the latest software version can always be found on our website: Motoplat.nl**

- Copy it to the root of 32 Gb MicroSD drive formatted in FAT32.

- Switch the tester off and insert the drive into the MicroSD connector of the device.

- Switch the tester on by connecting the red wire to the battery plus and the black one to its minus, or connect the device to 12V DC power supply.

- On launch, the device will automatically detect a new version of the software and start the installation.

•Wait until the installation is completed.

⚠ **WARNING: Do not interrupt the software update process by disconnecting the unit or removing the MicroSD drive.**

- The device will boot up upon finishing the installation.

- Switch the device off.

- Extract the MicroSD drive.

6.2 Cleaning & Care

Soft tissues or wipe cloths should be used to clean the surface of the device with neutral detergents. The display should be cleaned with a special fiber cloth and a screen cleaning spray. No abrasives or solvents should be used to prevent corrosion, failure or damage to the tester

7. MAJOR FAULTS AND TROUBLESHOOTING TECHNIQUES

Possible malfunctions and ways to fix them are described in the below table:

Failure symptom	Potential cause	Troubleshooting tips
1. The tester fails to be switched on	1.1. Poor contact with the diagnostic connector.	1.1. Check the connector for secure fixation
2. Tested parameters are displayed incorrectly.	2.1. Poor contact on the probe connectors. 2.2. Software error.	2.1. Restore the contact. 2.2. Contact the sales representative.
3. Data is displayed partially.	3. 1. Check the continuity of diagnostic probes. 3.2. Software error.	3.1. Replace the probes. 3.2. Contact the sales representative.
4. The display doesn't respond to the operator's touch.	4.1. The touch screen is damaged.	4.1. Contact the service department.
5. Diagnostics fails to be launched.	5.1. Operating system malfunction.	5.1. Contact the service department.

8. EQUIPMENT DISPOSAL

European WEEE Directive 2002/96/EC (Waste Electrical and Electronic Equipment Directive) is applicable to VC-05 COM Tester disposal. Obsolete electronic equipment and electric appliances including cables and fittings as well as batteries and accumulators must be disposed of separately from the household rubbish.

- Use available waste collection systems to dispose of outdated equipment.

- Proper disposal of old appliances will prevent harm to the environment and personal health.

APPENDIX 1

Terminals for connection to alternators

Indicial notation	Functional purpose	Terminal
B+ 30	Battery (+)	B+
A IG 15	(Ignition) Input for switch starting	
AS	Alternator Sense	
BVS	Battery Voltage Sense	
S	(Sense) Input for voltage comparison at control point	
B- 31	Battery (-)	B-
E	Earth, battery (-)	
D+	Used for connection to an indicator lamp that transfers initial driving voltage, and indicates alternator operability	L/D+
IL	Indicator Illumination	
L 61	(Lamp) Output for alternator operability indicator lamp	
FR	(Field Report) Output for load control on an alternator by engine management block	FR
DFM	Digital Field Monitor	
M	Monitor	
LI	(Load Indicator) Same as FR, but with universal signal (Drive) Input of voltage regulator control with P-D terminals Mitsubishi	
D	(Drive) Input of voltage regulator control with terminal P-D Mitsubishi (Mazda) and Hitachi (Kia Sephia 1997-2000)	GC
	(Digital) Input of code voltage installation on American Ford, same as SIG	
RC	(Regulator Control) same as SIG	GC
SIG	(Signal) Input of code voltage installation	

Indicial notation	Functional purpose	Terminal
RVC(L)	(Regulated Voltage Control) Similar to SIG, but voltage change ranges from 11.0 V to 15.5 V. Control signal is sent to L terminal	GC
C G	(Communication) Voltage regulator input to control engine operation block. Japanese cars	
RLO	(Regulated Load Output) Input to control stabilizing voltage from 11,8 to 15 V (TOYOTA)	
COM	(Communication) General term for physical interface, alternator control and diagnostics. Protocols of use: BSD (Bit Serial Device), BSS (Bit Syn- chronized Signal) or LIN (Local Interconnect Network)	
LIN	Direct indication on control interface and alternator diagnostics, con- ducted under LIN protocol (Local Interconnect Network)	
DF F FLD 67	Output of voltage regulator	F1; F2
P		
S STA	Output of one of alternator stator windings. Used for measuring alternator driving voltage	
Stator		
W	(Wave) Output of one of alternator stator windings for connection of tachometers in diesel engine cars	
N	(Null) Output of average stator winding point. Usually used to regulate alternator operability with mechanically regulated voltage by an indicator lamp	
D	(Dummy) Blank, no connection, mostly in Japanese cars	

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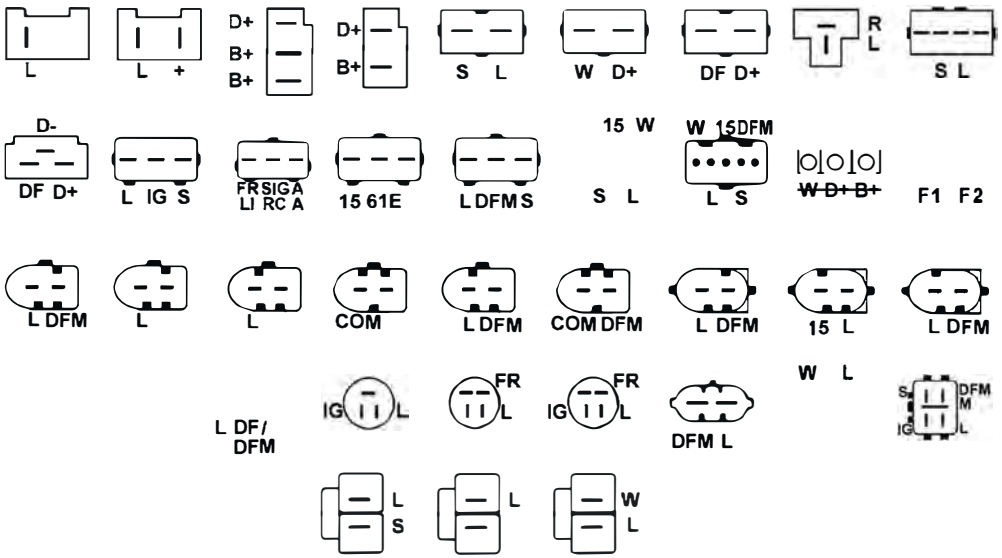
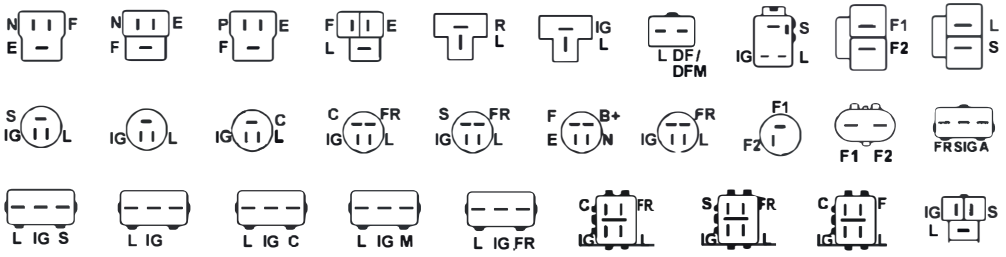
Indicial notation	Functional purpose	Terminal
N/C	(Load Response Control) Function of voltage regulator response delay on	
Options of LRC voltage regulators	load increase on an alternator. Delay duration ranges from 2,5 to 15 seconds. On increasing the load (lights, cooler fan on), a voltage regulator adds driving voltage smoothly ensuring stability of engine drive rotation. Remarkably seen under idle running	

Alternators connectors

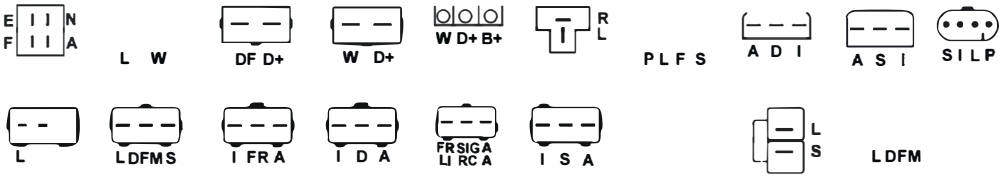
Bosch



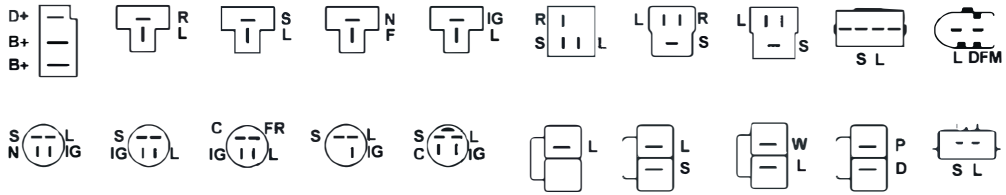
Denso



Ford/Lucas

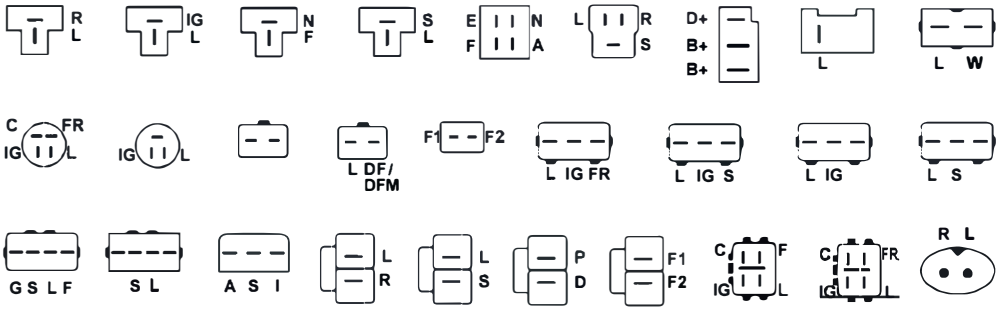


Hitachi

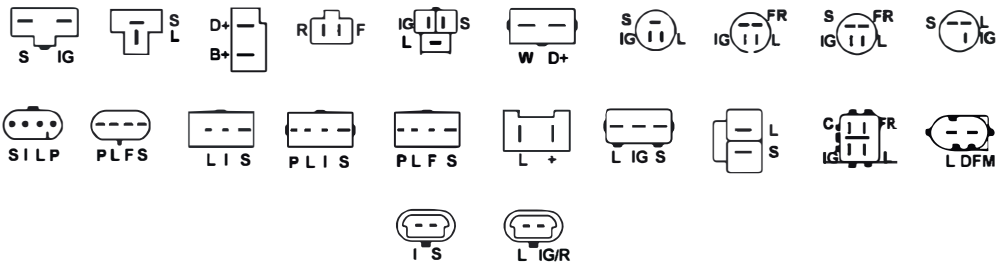


Magneti Marelli

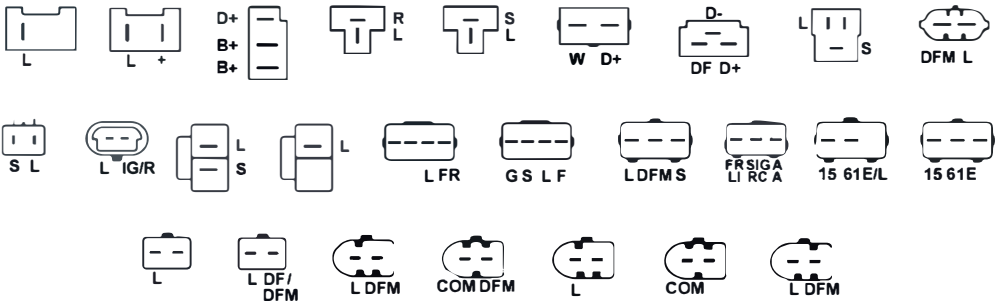
Mitsubishi



Delco Remy



Valeo



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