2017.05.16

MSG MS013 COM

ADAPTER FOR ADJUSTMENT OF VOLTAGE REGULATORS

USER MANUAL

QUALITY WARRANTY INNOVATION SERVICE TRAINING UNIQUENESS

CONTENTS

1. DESCRIPTION 3

2. TECHNICAL CHARACTERISTICS 4

3. CONTROL UNITS 5

3.1 Buttons 5

3.2 Terminals 5

3.3 Adapter Menu 6

4. SETTING INTO OPERATION 8

5. TESTING MODES DISPLAY DATA OUTPUT OF VOLTAGE REGULATORS 8

5.1 Display Data Output when Testing an Alternator or a Voltage Regulator with COM Terminal 8

5.2 Display Data Output when Testing an Alternator or a Voltage Regulator with RLO, P-D, SIG, C Terminals 9

5.3 Display Data Output in Ohmmeter Mode 9

5.4 Display Data Output in PWM Generator Mode 9

6. STEP-BY-STEP INSTRUCTION 9

6.1 Alternator or Voltage Regulator Testing 10

6.2 Ohmmeter Mode 10

6.3 PWM Signal Generator Mode 10

7. TEST CERTIFICATE 11

1. DESCRIPTION

Adapter MSG MS013 COM is used jointly with the test bench for diagnostics of alternators or with the voltage regulator tester.

The device simulates control signals for a tested voltage regulator. It contains integrated physical and program interfaces of all actually existing control modes of modern alternators. Adapter is controlled by clock encoder with button to install and change parameters. Installation and parameter data appear on LCD display.

The tester possesses the opportunity to change existing and implement new functions and interfaces in the software. Update download is carried out through USB port. Built-in power supply gives an opportunity to use the device as high-precision ohmmeter or generation of arbitrary PWM signals.

2. TECHNICAL CHARACTERISTICS

Supply voltage, V	12-15
Supply type	Batteries, direct-current source
Dimensions, mm	157*85*26
Weight, kg	0.3
Testing of voltage regulators	
Voltage, V	12
Tested parameters	- Stabilizing voltage - COM voltage regulators: protocol, speed of exchange, regulator type, errors
Voltage meter accuracy, V	0.1
Short circuit protection	Yes
Connection terminals	COM (LIN, BSS), P-D, DFM, RLO, C, SIG
Additional functions	
PWM signal generator	Yes
Ohmmeter	Yes

3. CONTROL UNITS

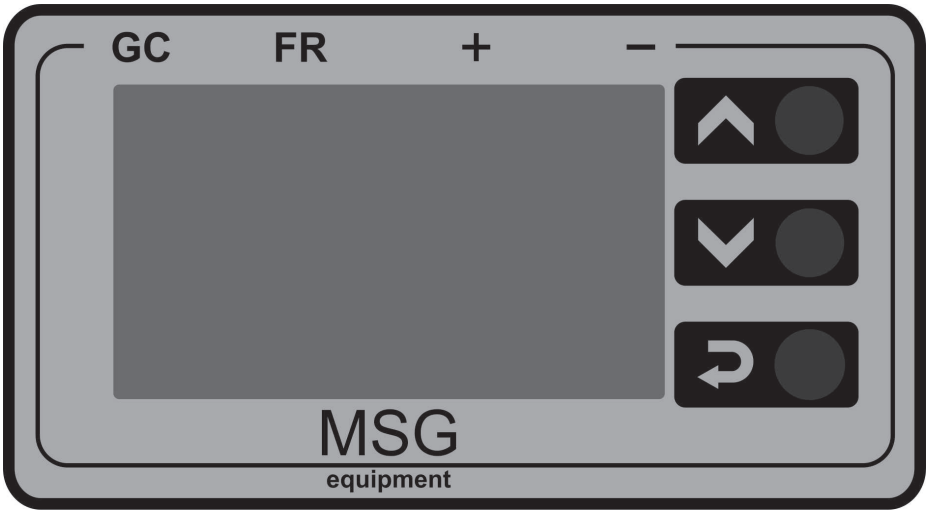


Fig. 1. MS013 COM - front view

3.1 Buttons

UP button. Used to select the required option in the adapter menu.

Performs increase function in the selected mode.

Down button. Used to select the required option in the adapter menu.

Performs decrease function in the selected mode.

Confirmation button of mode selection. Testing mode exit button.

3.2 Terminals

GC

Used to connect voltage regulator control terminals: COM (LIN, BSS); RLO; P-D; C; SIG. Used to connect a measuring probe (**Ohm** - ohmmeter) and a signal probe (**PWM** generator).

FR

Used to connect voltage regulator control terminals: **FR**, **DFM**, **M**.

\+

Used for connection of battery positive potential, provides power supply and voltage indication.

−

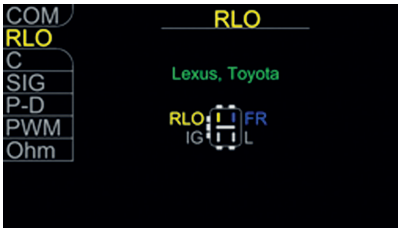
Used for connection of battery negative potential, provides power supply and voltage indication. Used to connect a measuring probe (**Ohm** - ohmmeter) and a signal probe (**PWM** signal generator).

3.3 Adapter Menu

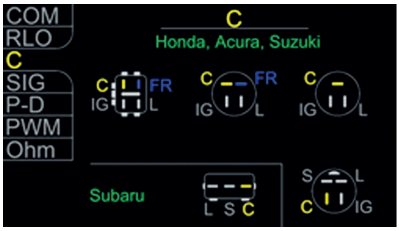
The menu contains 8 options:

COM: testing of voltage regulators or alternators with BSS or LIN terminals. The main connection ports of the terminals are displayed on the screen.

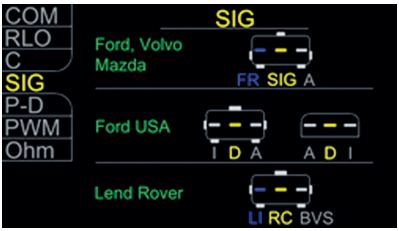
RLO: testing of voltage regulators or alternators with RLO terminal. The connection port of the terminal is displayed on the screen.



C: testing of voltage regulators or alternators with C terminal. The connection ports of the terminal are displayed on the screen.

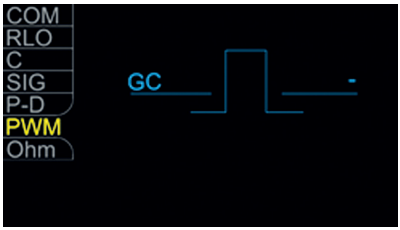


SIG: testing of voltage regulators or alternators with SIG terminal. The connection ports of the terminal are displayed on the screen.



P-D: testing of voltage regulators or alternators with P-D terminals. The connection ports of the terminals are displayed on the screen.

PWM: PWM signal generator. PWM signal generator connection scheme is displayed on the screen.



Ohm: ohmmeter. Ohmmeter connection scheme is displayed on the screen.

4. SETTING INTO OPERATION

Check the set received. It must contain:

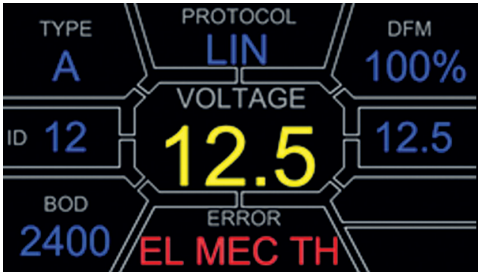
- adapter;
- wires to link voltage regulators and batteries;
- User Manual.

Inspect the adapter for existence of damage. If it is found, please contact either the manufacturer or trade representative before launching the equipment.

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

5. TESTING MODES DISPLAY DATA OUTPUT OF VOLTAGE REGULATORS

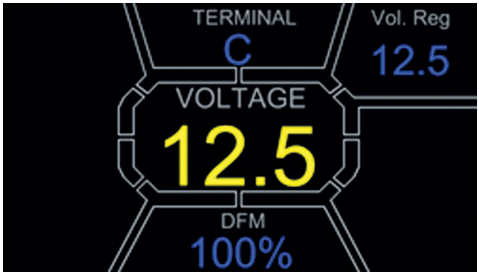
5.1 Display Data Output when Testing an Alternator or a Voltage Regulator with COM Terminal



- **TYPE:** voltage regulator connection type. Data is displayed in LIN and BSS protocols and can be of A and B type.
- **ID:** voltage regulator identification number, varying from 1 to 254.
- **BOD:** data exchange speed of a voltage regulator with car ECU. The speed in BSS protocol is 2400 (Low), in LIN protocol it can be 2400 (Low), 9600 (Average), 19200 (High).
- **PROTOCOL:** BSS or LIN voltage regulator protocol is displayed.
- **VOLTAGE:** voltage, generated by an alternator.
- **ERROR:** voltage regulator operation errors. Existing errors: EL – electric error; MEC – mechanic error; TM – thermal error.
- **DFM:** alternator load control indicator.
- **12.5:** set voltage indicator. Voltage is set with **UP** and **DOWN** buttons.

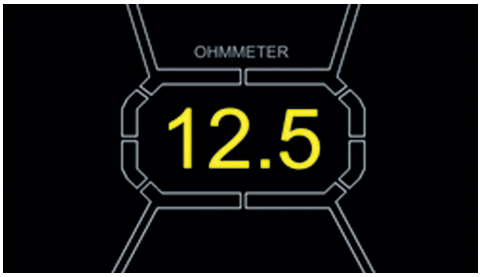
5.2 Display Data Output when Testing an Alternator or a Voltage Regulator with RLO, P-D, SIG, C Terminals

- **TERMINAL:** voltage regulator testing mode terminal. RLO, C, SIG, P-D terminals are displayed on the screen. Terminal output in this frame depends on the selected option in the menu.
- **VOLTAGE:** voltage, generated by an alternator.
- **DFM:** alternator load control indicator.
- **Vol. Reg:** set voltage indicator. Voltage is set with **UP** and **DOWN** buttons.



5.3 Display Data Output in Ohmmeter Mode

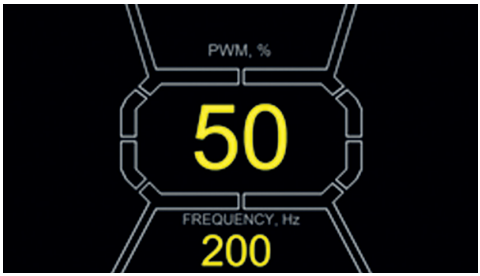
- **OHMMETER:** resistance indicator. Resistance is displayed in Ohm.



5.4 Display Data Output PWM Generator Mode

- **PWM, %:** percentage of duty cycle set varying from 0 to 100.
- **FREQUENCY, Hz:** frequency set, displayed in Hertz with variation from 0 to 1000.

Frequency and PWM, % is set by pressing the corresponding frames on the touch screen. It is set with **UP** and **DOWN** buttons.



6. STEP-BY-STEP INSTRUCTION

Before using the adapter, make sure that the device is not damaged and has no cracks.

6.1 Alternator or Voltage Regulator Testing

- Connect an alternator or a voltage regulator to the testing equipment (test bench for diagnostics of alternators, voltage regulator tester).
- Connect the adapter to 12V power supply.
- Select the required option in the adapter menu with buttons .
- Connect the control output of a voltage regulator to GC connection port.
- Enter the required testing mode with button .
- Follow the display data, set voltage with **UP** and **DOWN** buttons.
- To exit the testing mode, press button .
  Disconnect the wires.

6.2 Ohmmeter Mode

- Select the required option in the adapter menu with buttons .
- Enter the required testing mode with button .
- Connect GC and '-' wires of the adapter outputs to measured resistance.
- To exit the testing mode, press button .
  Disconnect the wires.

6.3 PWM Signal Generator Mode

- Select the required option in the adapter menu with buttons .
- Enter the required testing mode with button .
- Connect GC and '-' wires of the adapter outputs to a controlled device.
- Set duty cycle by pressing the corresponding frame on the touch screen. The lighting of the buttons will change, use buttons to set the required numbers.
- Set frequency by pressing the corresponding frame on the touch screen. The lighting of the buttons will change, use buttons to set the required numbers.
- To exit the testing mode, press button .
  Disconnect the wires.

7. TEST CERTIFICATE

Tester MSG MS013 COM for adjustment of voltage regulators meets technical requirements of Directive 2014/30/EU - Electromagnetic Compatibility (EMC) EN Directive 2014/35/EU - Low voltage (LVD) Directive 2006/42/EC - Machinery (MD) and is qualified for exploitation.

MSG
equipment