MSG MS005 Test Bench for Diagnostics of Alternators and Starters User Manual

MSG MS005 Test Bench for Diagnostics of Alternators and Starters

Contents

INTRODUCTION

We appreciate you have chosen the products of TM MSG equipment. The present user manual consists of the information on the application, supply slip, design, specifications and rules of usage of test bench MS005. Prior to using the test bench MS005 (hereinafter, “the bench”), study the present user manual thoroughly. If required, get the special training at bench manufacturer facilities. Due to the permanent improvements of the bench, the design, supply slip and software are subject to modifications that are not included to the present user manual. Pre-installed bench software is subject to update. In future, its support may be terminated without a prior notice.

APPLICATION

The bench is designed to check the technical condition of the automotive alternators with different connection terminals, alternators of system «start-stop» 12V, starters and 12V automotive lead-acid storage batteries. The bench displays the measured parameters in real time oscillographically that allows to see the broad picture of unit operation, and to make more accurate check of unit condition. The diagnostics of automotive alternators takes into account the following criteria:

- stabilizing voltage;
- control lamp working performance capacity;
- displaying of the frequency and FR duty ratio (voltage regulator response); – the AC pulsation value.

Additionally for COM alternator types:

- ID;
- protocol;

- data exchange speed;
- LIN protocol type;
- regulator self-diagnostics errors.

The diagnostics of the automotive starters considers the voltage changes nature and the currents on the terminals 30, 45 and 50 during the starter operation.

SPECIFICATIONS

Main		
Supply voltage, V		400
Supply mains type		Three phase
Drive power, kW		7.5
Dimensions (L x W x H), mm		655×900×1430
Weight, kg		130
Quantity of storage batteries (not included into supply slip)		2 similar lead-acid by 12V
Battery capacity		45Ah min
Storage battery automatic charging No.1		Yes
Storage battery automatic charging No.2		Yes
Rated voltage of the diagnosed units, V		12, 24
Maximum overall length of the diagnosed unit, mm (m)		410 (0,41)
Alternator diagnostics		
Load, A	12V	300A
	24V	150A
Verification regime		Automatic/manual
Load adjustment (0-100%)		Smoothly
Drive speed, rpm		0-3000
Drive speed adjustment		Smoothly
Drive type (alternator drive)		V-belt drive/Poly V-belt drive
Types of diagnosed alternators	12V	Lamp, SIG, RLO, RVC, C KOREA, P-D, C JAPAN, COM (LIN, BSS), «S/A PSA »
	24V	Lamp, COM (LIN)
Starter diagnostics		

Power of diagnosed starters, kW	up to 11
Measured parameters	The charts displaying the operation sta rting mode, voltage variations and voltage current on the terminals: К30, К50 и К4 5

Storage battery diagnostics	
Types of diagnosed storage batteries	Any lead-acid storage batteries 1 2V
Measured parameters	Capacity
Additional features	
Display	Touch Screen 12”
Software update	Available
Alternator database	Available
Diagnostics results storage	Available
Printing	Available
Internet connection	Wi-Fi (802.11 a/b/g/ac), Ethernet

EQUIPMENT SET

The equipment set includes:

Item name	**Number of pcs**
Test bench MS005	1
MS33001 – a cable with a kit of adapting wires – for the connection to alternator connector	1
Cable for starter diagnostics	1
Alternator positive terminal adapter	2
MS0114 – Cutout fuse (type 22×58 mm, current 100A)	1
Stylus	1
Bench door keys	2
Module Wi-Fi	1
Socket 400V	1
User Manual (card with QR code)	1

TEST BENCH DESCRIPTION

1. Access door to storage battery location.
2. Working spot.
3. Protective housing.
4. Touch screen – to display diagnostic parameters of a diagnosed unit and to control the bench functions.
5. Control panel.
6. Pivot wheels with brake.

The working spot (fig.2) consists of the following components:

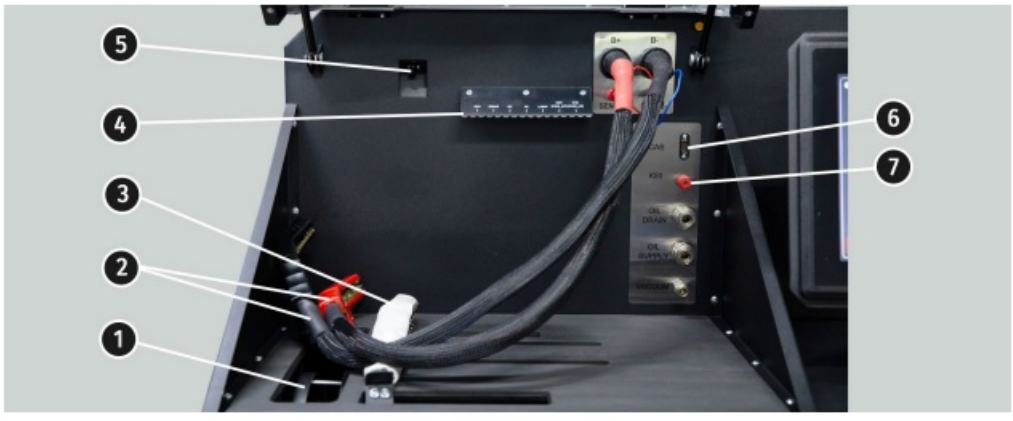

Figure 2. Bench working spot

1. Alternator drive belts: V-belts and poly V-belts.
2. Power cables «B+» «B-».
3. Unit fixing chain.
4. The bracket for a diagnostic cable alligator clips.
5. Thermal vision camera.
6. Diagnostic cable connection port.

7. Diagnostic cable connection port for starter diagnostics.

The control panel (fig.3) consists of:

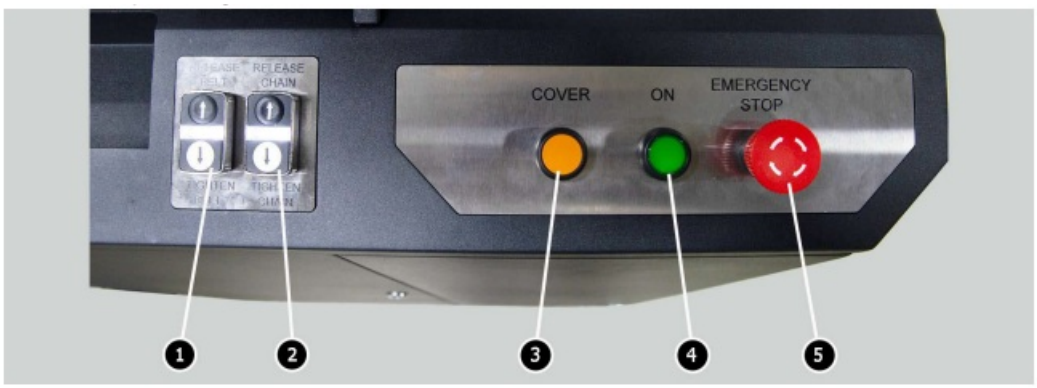

Figure 3. Bench control panel

1. **buttons to control the tightening and loosening of alternator drive belt.**
2. buttons to control the tightening and loosening of unit fixing chain.
3. button «COVER» – opens the protective housing.
4. button «OFF/ON» – is responsible for the power on the bench. The bench is turned off by pressing the button «Turn off the bench» in the main menu of 1the service program.
5. Button «EMERGENCY STOP» – emergency stop of generator drive and chain/belt tightening.

In the bottom of the touch screen there are two USB ports (fig.4 ref. 1) for connecting the computer periphery (mouse, keyboard, WiFi adapter) and network LAN port (ref. 2).

Figure 4. Position of USB and LAN ports

The bench supply slip includes the diagnostic cable (fig.5) that consists of the adapting wire kit (fig.6) – for more convenient connection to alternator connection terminals

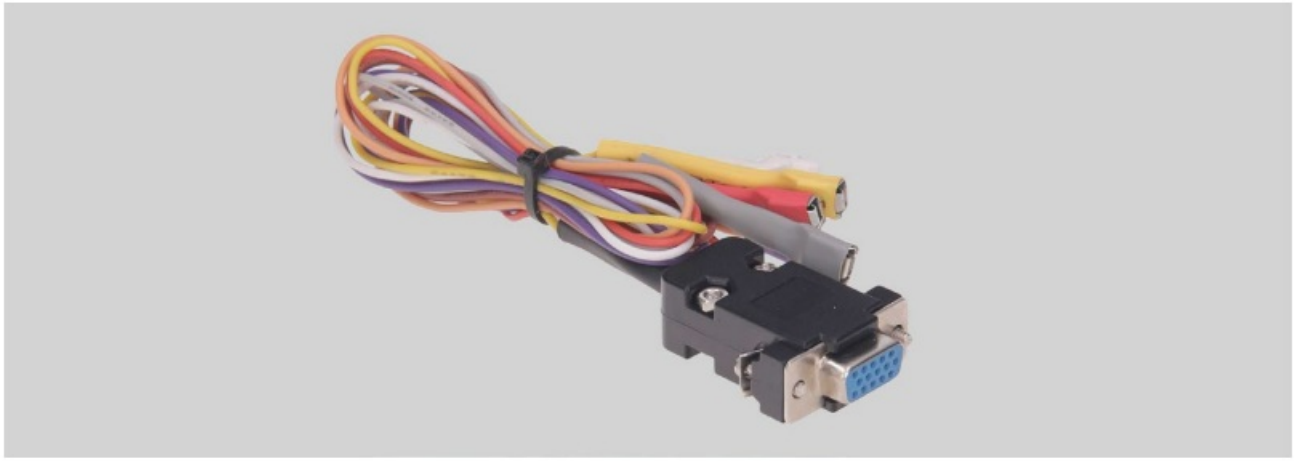

Figure 5. Diagnostic cable MS-33001

Figure 6. Adapting wire kit

The diagnostic cable MS-33001 has the following adapting wire color codes (see also Table 1):

- Orange – S (Sense Pin) – the terminal that enables the measuring of the storage battery voltage by the voltage regulator as well as it compares the storage battery voltage with the alternator output voltage. This adapting cable is connected to terminal S;
- Red – IG (Ignition) – the terminal is used for the connection of the ignition circuit, the terminals: 15, A, IG;
- White – «FR» – the terminal that transmits the data on the regulator load. This adapting wire is connected to the following terminals: «FR», «DFM», «M»;
- Gray – «D+» – the terminal for the connection of the circuit of voltage regulator control lamp. It's connected to the terminals: «D+», «L», «IL», «61»;
- Yellow – «GC» – is used for the connection of the channel of alternator voltage regulator control. This adapting wire is connected to the following terminals: «COM», «SIG», etc.
- Brown – «K30» – is connected to the starter terminal 30 that is connected to the storage battery terminal «+».
- Violet – «K45» – is connected to the starter solenoid output connected with starter electric motor.

Table 1 – Color codes of cable MS-33001

Connector	Terminal
	S
	IG
	FR
	Lamp
	GC
	K30 (starter)
	K45 (starter)

For convenient usage of the diagnostic cable, it’s recommended to put the alligator clips onto the bracket (ref. 4, fig.2).

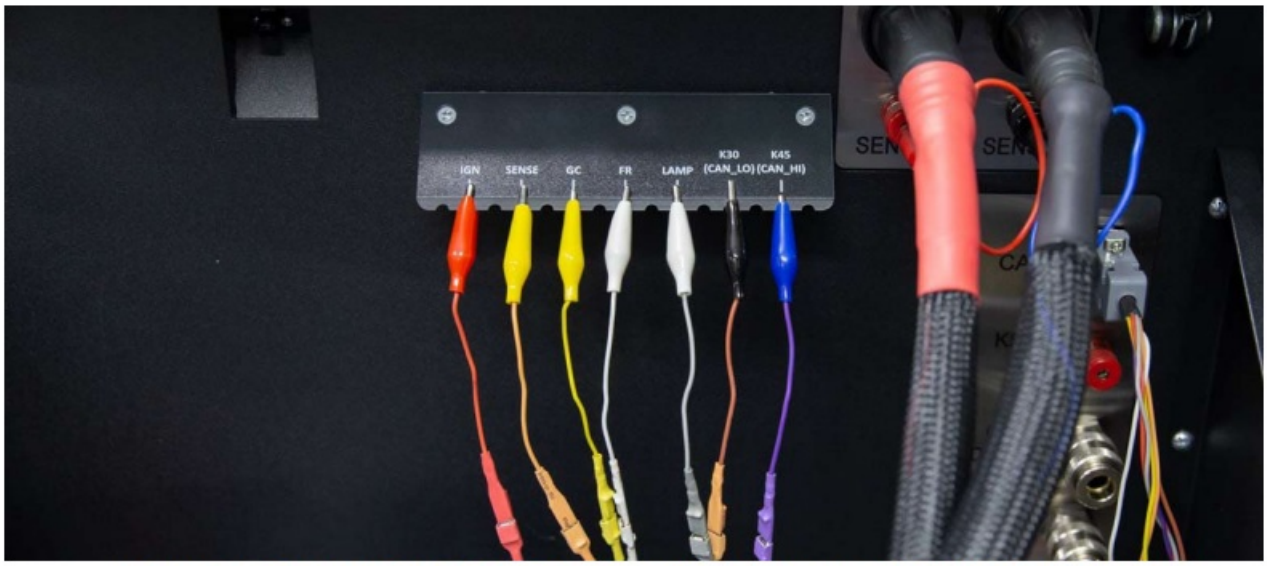

Figure 7. Diagnostic cable alligator clips that are set on the bracket.

For the diagnostics of the starter, use the cable MS-33001 and the cable for the connection of the terminal 50 (fig.8)

Figure 8. Cable for the connection of starter terminal 50

APPROPRIATE USAGE

1. Use the bench for the specified purpose only.
2. Turning off the bench should be done through the interface of the service program by pressing the “Turn off the bench” button.
3. Use EMERGENCY STOP button only if you need to immediately stop the bench drive, turn off the belt/chain tightening and turn off the supply of the power cables.
4. The terminals of the diagnostic cable MS-33001 that are used for the diagnostics of alternators and starters shall be connected only to the relay regulator terminals and starter terminals K30 and K45.
5. To protect the touch screen from damages use the stylus (included to supply slip).
6. In case of failures in the operation of the bench, stop further operation and contact the manufacturer or sales representative. The manufacturer is not responsible for any damage or injury to human health resulting from non-compliance with the requirements of this user manual.

Safety Guidelines

1. The bench has to be operated by the qualified persons who got the access to operate the definite bench types and who were instructed on the safe operating procedures and methods.
2. The bench has to be turned off if the supply is terminated, during the cleaning and tidying up, as well as in the emergency situations.
3. The work area must always be clean, with good light illumination, and spacious.

4. To ensure electrical and fire safety **PROHIBITED:**
   – connect the bench to the electrical network having faulty protection against current overloads or not having such protection;
   — use a socket without a grounding contact to connect the bench;
   — use extension cords to connect the bench to the electrical network. If the socket is far from the bench installation site, it is necessary to modify the electrical network and install the socket;
   – operation of the bench in defective condition.
   – Independently to repair and make changes to the design of the bench, because it can lead to serious damage to the bench and deprive the right to warranty repair. 5. It's forbidden to leave the units with running drive on the bench unattended. 6. While mounting and dismounting of a unit from the bench, to prevent the hands from harming, be more cautious.
5. Do not open the access door to the bench power section when the bench is connected to the 400V supply circuit.

Installation and connection of test bench

The bench is delivered packed. Release the bench from the packaging materials, remove the protective film from the display (if available). After unpacking, it is necessary to make sure that the bench is intact and does not have any damage. If damage is detected before the bench is activated, contact the manufacturer or the sales representative. The bench has to be placed on the level floor, with the pivot wheels fixed from rotating (min. two wheels) by the activating of the brake mechanism. The bench ensures the operation at the temperature from +100C up to +400C and relative air humidity from 10% up to 75%. When installing the bench, keep the minimum space gap 0.5 m from the rear bench side – for a proper air circulation. Prior to the bench operation, connect: – storage batteries 12V that have to be located in the storage battery section of the bench (fig.9). The left door is opened with the keys (included to the supply slip). While connecting the storage batteries refer to the power cable markings. If only one storage battery is connected just 12V diagnostic mode will be available, 24V diagnostic mode will be unavailable.

Figure 9. Location of the storage batteries in the bench.

- electric mains 400V referring to the markings inside the socket (included to the supply slip).

TEST BENCH MAINTENANCE

The bench is designed for a long operation life and doesn't have any special maintenance requirements. At the same time, to ensure the maximum operation life, the regular monitoring of bench technical condition should be

made as follows:

- motor operation inspection (uncommon noises, vibration etc.);
- alternator drive belts condition (visual inspection);
- power wires condition (visual inspection);
- inspection of bench operation environment (temperature, humidity etc.).

Test bench software update

Being connected to the Internet, with every switching on, the test bench checks for software updates of diagnostics program, database and bench firmware. In case the bench finds the software update at company server, you'll be offered to install the update or disregard it. To start updating, press OK, to decline SKIP.

 **ATTENTION!** Updates may take a while to install.

 **WARNING!** It's forbidden to switch off the bench supply to stop the updating.

Cleaning and care

To clean the bench surfaces, use either the soft napkins or rags, and neutral cleansers. The display should be cleaned with a special fiber display cleaning cloth and with a spray for display cleaning. To prevent the bench from the failure and corrosion, do not use abrasive materials and solvents.

TROUBLESHOOTING GUIDE

Below you will find the table with the possible problems and the solutions on their elimination.

Problem	Causes	Solutions
1. The bench doesn’t start.	The automatic switch behind the be nch left door got activated	Open the left door with the key from th e supply kit, turn on the automatic swit ch to the up position.
	The left door is open, the protective t erminal switch of the left door got ac tivated	Close the left door.
	One of the bench supply phases (L1 /L2/L3) or neutral N are lacking	Restore the supply.
2. The bench runs but the elect ric motor	The variable speed drive software e rror.	Contact the dealer.
doesn’t start.	The bench wiring is damaged.	
3. When the bench runs the ab normal noises are heard.	The diagnosed unit is mounted wrong. (The driving belt is over tight ened or out of alignment)	Re-mount the unit for the diagnostics.
4. When the bench runs the ab normal noises are	The belt tightening is not enough	Stop the drive and check the tightening intensity
heard.	The wear of the belt.	Replace the belt.
5. During the alternator test the contact clips heat up much. (alli gator clips)	The contact area is small.	Use a positive terminal adapter of the alternator.

RECYCLING

For the recycling of the bench refer to the European Directive 2202/96/EC (WEEE Directive – the directive on waste electrical and electronic equipment).
The outdated electronic devices and electrical appliances, including the cables, hardware, batteries and storage batteries shall be disposed separately from the house waste. To dispose the waste products, exploit the available returning and collecting systems.
The appropriate disposal of the outdated devices helps to prevent harming to environment and health.

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Documents / Resources

	MSG MS005 Test Bench for Diagnostics of Alternators and Starters [pdf] User Manual MS005 Test Bench for Diagnostics of Alternators and Starters, MS005, MS005 Test Bench, Test Bench, Test Bench for Diagnostics of Alternators and Starters

References

- MSG Equipment - wyposażenie warsztatów TM MSG equipment. - msgequipment.pl