AUTOMOTIVE TESTER 2201

CONTENTS

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To take full advantage of the unit, you should be familiar with the OEM computer systems that are supported.

This manual tells you how to use the unit to perform diagnostic test and to find possible locations of vehicle problems. It does NOT tell you how to correct the problems. Consult your OEM vehicle service manual for repair instruction.

If you experience a problem obtaining service data from a vehicle, it may be due to a vehicle manufacturing design change.

Copyright Information

Precautions

1. Safety Precautions

Please read the following precautions carefully before using Digital Automotive Tester 2201.

- As the battery liquid contains sulfuric acid, take care to avoid direct contact of it with your skin. Special attention should be paid to avoid splashing battery liquid into your eyes and keep it away from fire.

- There are various kinds of poisonous venomous compounds such as hydrocarbon, CO, NO in the vehicle exhaust gas. Avoid breathing this gas. Park vehicle in a well-ventilated place while testing.

- The temperature is very high while the engine is running.

- Avoid touching water tank and vent-pipe and any other parts with high temperature.

- Before starting engine, be sure to apply the hand brake, and block the front wheels and shift the gear rod in the neutral position (manual transmission) or the P position (automatic transmission).
- Remember to wear protective gloves while performing the test.
- If you use the battery as power supply, connect the RED jaw to the positive terminal, and the BLACK jaw to the negative terminal.

2. Precautions on Testing with 2201

Read this instruction carefully before testing:

- The digital automotive tester 2201 is designed meeting the requirements of Class II and GB 4793.1 Pollution and IEC-1010 on Electronic Testing Instrument over voltage (CATII).
- It is forbidden to make a test with back cover open since there is a danger of electric shock.
- Check the harness of electronic probes damaged or worn out before testing.
- Electronic probes must be pulled out first, and then turn the Function/Range Switch before enter or exit the current ranges in order to protect the mechanic devices.
- The input signal must not exceed the nominal value; otherwise, it will damage the tester.
- Do not turn Function/Scope Switch while testing.
- The potential drop will not exceed 1000V between COM and GND; otherwise the operator will be shocked.
- Be careful when the voltage is higher than DC 60V and AC

42V.

- Please change a new battery for precision in time testing when the symbol of  displayed.
- Always use the same specification fuse for the instrument.
- This tester is an exact electronic system, never break or hit it while operating.
- Before testing, select the correct testing scope and correct testing leads.
- Never try to repair the unit.

Introduction

Digital Automotive Tester 2201

----Newly developed digital automotive tester 2201 with super design, easy operation, accurate readings, large LCD display as well as protective mould.

----Unique protective device for wrong operation. The testing port of "mA" or "20A" can only be opened when the current option is chosen, otherwise, a blockage will work at the moment for the protection.

----A PTC thermal element is connected with the input port "VΩ %" so as to guarantee the safety and lifetime as well as the switches for range scope.

----Used to test the voltage & current of DC, the voltage & current of AC, resistor, duty, temperature, parameter of diode and triode, open circuit, dwell and TACH

---Portable tester for automobile testing and maintaining, engineering, lab testing, production testing, field work and home electric appliances repairing etc

Electric symbol

DEWLL		BUZZ	
DC		DOUBLE ISOLATION	
AC		TACH	
LOW BATTERY		HIGH PRESSURE	
ALARM		AD OR DC	
GND		MC	
DIOAD			

CYL

CE ∈

DUTY

Features

1. Low power consumption CMOS double differential A/D converter integrated circuit, automatic zero calibration, automatic pole displaying, data storing, low energy consumption and large measuring range
2. Accuracy of the current: ±0.5%
3. Dwell: 0.1℃-120℃
4. RPM measuring: 10RPM-10000RPM
5. Temperature: -20℃-1000℃
6. Automatic power off: the power will be turned off automatically 15 minutes after the power on for the protection
7. Mechanical protection for full range overload
8. Maximum value: 1999(3 1/2)
9. Large LCD display: 70x48mm, the height of the letter up to 28mm
10. Power: 9V battery (NEDA1604, 6F22 or similar)
11. Low voltage alarm: 
12. Dimension: 192x88x42mm
13. Weight: 600g (including battery and mould)
14. Working condition:

Temperature: 0℃-40℃	Relative Humidity: <85%
Temperature: -10℃-50℃	Relative Humidity: <85%
Optimum Temperature: 23℃±5℃	Relative Humidity: <75%

Technical Parameters

1. DC Voltage

Range	Accuracy	Resolution
2V	±(0.5%+2)	1mV
20V		10mV
200V		100mV
1000V	±(0.8%+3)	1V

Input Impedance: 10MΩ

Over load protection: DC 1000V or AC 700V (effective value)

2. AC Voltage

Range	Accuracy	Resolution
2V	±(0.8%+3)	1mV
20V		10mV
200V		100mV
700V	±(1.2%+5)	1V

Input impedance: 10MΩ

Frequency: 40Hz—400Hz

Over voltage protective: DC 1000V or AC 700V (effective value)

Display: average value (sine wave effective value)

3. DC Amperage

Range	Accuracy	Resolution
20mA	±(0.8%+2)	10μA
200mA	±(1.2%+2)	100μA
20A	±(2%+5)	10mA

Over current protective: 0.2A/250A fuse (no fuse for the range of 20A)

Max. input current: 20A (less than 15s)

Voltage drop: 200mV voltage drop for the full range

4. AC Amperage

Range	Accuracy	Resolution
20mA	±(1%+3)	10μA
200mA	±(1.8%+3)	100μA
20A	±(3%+7)	10mA

Over load protection: 0.2A/25.A fuse (no fuse fro the ranges of 20A)

Max. input current: 20A (less than 15s)

Voltage drop: 200mV voltage drop for the full range

Frequency: 40Hz—400Hz

Display: average value (sine wave effective value)

5. Resistor

Range	Accuracy	Resolution
200Ω	±(0.8%+3)	0.1Ω
20KΩ	±(0.8%+2)	10Ω
200KΩ		100Ω
20MΩ	±(1%+5)	10KΩ

Over load protection: 250V, DC or AC effective value

Open circuit voltage: <700mV

6. Duty

Range	Accuracy
0.1%--99.9%	±(1%+5)

7. Temperature

Range	Accuracy	Resolution
-20℃—0℃	±(5%+5)	1℃

0℃—400℃	±(1%+3)	1℃
400℃--1000℃	±(2%+4)	1℃

8. Transistor Triode hFE Parameter Testing

Range	Description	Testing Conditions
hFE	Testing the parameter of NPN or PNP triode hFE The range is 0—1000ß	I_b is about 10μA, V_{ce} is about 2.8V

9. Diode and On-Off Testing

Range	Resolution	Description	Testing Conditions
	1mV	Displaying the positive voltage drop for Diode	Positive DC amperage is about 1mV Negative DC voltage is about 2.8V
	--	Buzz will work when the resistor of the circuit is lower than 50Ω	Open circuit voltage is about 2.8V

Over load protection: 250V, DC or AC effective value

10. Dwell for Distributor Contactor

Cylinder	Range	Accuracy	Resolution
3CYL	0—120	±(1.2%+2)	0.1°
4CYL	0—90°		
5CYL	0—72°		

6CYL	0—60°		
8CYL	0—45°		

11. Rotation Speed (rpm)

CYL	Range	Accuracy	Resolution
3CYL	500—10000 RPM	±(1.2%+2)	10RPM
4CYL			
5CYL			
6CYL			
8CYL			

Front Board of Digital Automotive Tester

1. Description

① LCD Display
② Hold switch
③ Range knob
④ Temperature socket
⑤ Insert COM
⑥ Power switch
⑦ Triode socket
⑧ Sliding plate

Operation

Press down the Power switch. If the battery voltage is too low, the symbol [+ -] will be displayed on the left upper screen. You should change a new battery.

Select the required functions and testing ranges.

1. Measuring DC Voltage

① Turn the Function/Range knob to the DCV range scope.

② Insert the black lead into COM and the red lead into the hole VΩ%. And then connect the lead to the tested load in parallel. The multimeter will display the value of the voltage and the polarity of the red lead at the same time.

Note:

a. Turn the Function/Range knob to the maximum before measuring the voltage.

b. The voltage of the tested load is out of the testing scope when the displayed value is "1". You should change another higher range.

c. The symbol of ⚠ means the voltage must be lower than 1000V; otherwise, the multimeter will be damaged.

d. Pay attention to the safety when testing the high voltage.

Application 1. Testing the distributor with DC 2V testing scope

A. Take down the high tension from the cap of the distributor and short it to ground.

B. Connect the red lead to the low voltage terminal of the distributor or the negative of the ignition coil; connect the black lead to the ground or the negative of the battery,

C. Turn on the ignition switch for a while and the multimeter will display the value. The value should be lower than 1V.

D. Measure the voltage of the contact. If the displayed value is lower than 0.2V, it proves that the contact is good.

Application 2. Leakage testing by DV 2V testing scope

A. Connect the black lead of the multimeter to the negative of the battery and the red lead to the positive of the battery.

B. If the multimeter displays a certain value, it proves that the battery is leaking. The best way is to clean the battery immediately.

Application 3. Testing the loading capacity with 20V testing scope

A. Connect the black lead to the negative of the battery and the red lead to the positive of the battery respectively.

B. Turn on the headlights, the flash light switch, the ignition switch and the radio.

C. The operating time is no longer than 2 minutes.

D. Checking the displayed values. If the value is lower than 11.7V, you should change another battery or charge it.

Application 4. Testing the battery capacity by 20V testing scope

A. Take down the high tension from the cap of the distributor and short it to ground.

B. Connect the black lead of the multimeter to the negative of the battery and the red lead to the positive of the battery.

C. Start the engine for 15 seconds and check the displayed values. If the value is higher than 9.1V, it proves that the battery is ok. Otherwise, you have to check the engine or charge the battery or replace it.

Application 5. Testing the battery cable

A. Test the voltage of the battery cable as well as the working conditions when starting the engine

Application 6. Checking the charging system

Application 7. Checking the voltage regulator

2. Measuring AC Voltage

a. Turn the Function/Range knob to the ACV testing scope

b. Insert the black lead into COM hole and the red lead into the hole with the symbol of VΩ%. Meanwhile, parallel the lead to the tested load.

Note:

a. Turn the Function/Range knob to the maximum before measuring the voltage.

b. The voltage of the tested load is out of the testing scope when the displayed value is "1". You should hange another higher range.

c. The symbol of ⚠ means the voltage must be lower than 700V; otherwise, the multimeter will be damaged.

d. Pay attention to the safety when testing the high voltage.

3. Measuring DC Amperage

a. Take out the testing lead and turn the Function/Range knob to the DCA testing scope

b. Insert the black lead into COM hole and the red lead into the hole with mA or 20A. Connect the testing lead in series in the circuit. The multimeter will display the readings as well as the polarity of the red lead.

Note:

a. Turn the Function/Range knob to the maximum before measuring the voltage.

b. The voltage of the tested load is out of the testing scope when the displayed value is “1”. You should change another higher range.
c. The overload will damage the in-built fuses when testing by mA scale. The specification of the fuse is 0.2A/250V
d. Never exceed 15 seconds when testing the load by maximum current 20A. There is no fuse at the scale of 20A.

4. Measuring AC Amperage

a. Take out the testing lead and turn the Function/Range knob to ACA testing scope.
b. Insert the black lead into the COM hole and the red lead into the hole with mA or 20A. Connect the testing lead in series in the circuit.

Note:

a. Turn the Function/Range knob to the maximum before measuring the voltage.
b. The voltage of the tested load is out of the testing scope when the displayed value is “1”. You should change another higher range.
c. The symbol of ⚠ means the voltage must be lower than 1000V; otherwise, the multimeter will be damaged.
d. Pay attention to the safety when testing the high voltage.

5. Measuring Resistance

a. Turn the Function/Range knob to Ω testing scope.
b. Insert the black lead into COM hole and the red lead into the hole with VΩ%. Connect the testing lead in parallel in the circuit.

Note:

a. When the circuit is open, the multimeter is in the testing state, the display the maximum

b. When the tested resistor is higher than 1MΩ, the mulitimeter will display the stable values after few seconds. It is normal for testing high resistant.

c. Turn off the power supply for the tested circuit and let the capacitor discharge when testing the resistors, which is already connected in the circuit.

Application 1. Testing the impedance by the scale of 20Ω and 200kΩ

Application 2. Checking the working conditions of the capacitor by 20MΩ

6. Measuring Duty

a. Turn the Function/Range knob to DUTY scale.

b. Insert the black lead into COM hole and the red lead into the hole with VΩ%.

7. Measuring Temperature

Turn the Function/Range knob to ℃ scale. Insert the testing plug of the thermal coupler into the mulitimeter socket when testing the temperature. Pay attention to the polarity of the positive and negative. Put the testing end of the thermal coupler to the tested parts. The multimeter will display the temperature values. The unit is degree (℃).

Note:

a. The displayed values are the temperature of the tested parts when the thermal coupler inserted into the socket.

The displayed values are the environmental temperature when the circuit is open.

b. The temperature limit for the thermal coupler (TP-01 Type K) provided by the factory is 250℃. (The limit value can reach 300℃ in a short period.)

8. Measuring Triode hFE Parameter

a. Turn the Function/Range knob to the hFE scale.

b. Check the type of the Triode. Insert the Pin E, B, C into the right holes.

c. The displayed values are approximate. The current for the basic polarity is 10μA and the voltage is 2.8V

9. Measuring Triode

a. Turn the Function/Range knob to the  scale.

b. Insert the black lead into COM hole and the red lead into the hole with VΩ%. Pay attention to the polarity of the read lead. Connect the testing lead in parallel with the tested diode. The multimeter will display the positive voltage drop for the diode with the unit is V. The multimeter will display over range when the diode connected in the opposite direction.

Note:

a. When the circuit is open, the multimeter will display over range.

b. Normally, the current for the tested components is 1mA.

c. It can be used to check the conditions of the rectifier diode.

10. On-Off Testing

a. Turn the Function/Range knob to the scale of 

b. Insert the black lead into COM hole and the red lead into the hole with VΩ%. Connect the testing lead in series in the circuit.

c. The buzz will make the sound of Di-Di when the resistance is lower than 50Ω.

Note: Check the circuit when the power off otherwise an error will come up.

11. Holding Function

The multimeter will display the letter H when the Hold button pressed. It is easy for you to read the measured values with this function. The letter H will disappear when the button pressed again.

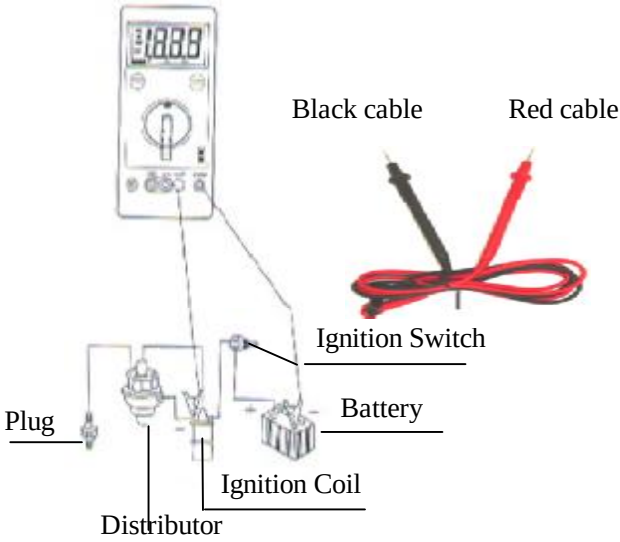
12. Dwell Measuring

a. Insert the black lead into COM hole and the red lead into the hole with VΩ%.

b. Turn the switch to the scale of DWELL according to the cylinder numbers.

c. Connect the black lead to ground or the negative of the battery and the red lead to the low voltage terminal of the distributor. See the following pictures

d. Start the engine and read the dwell by the multimeter.



Picture for Dwell

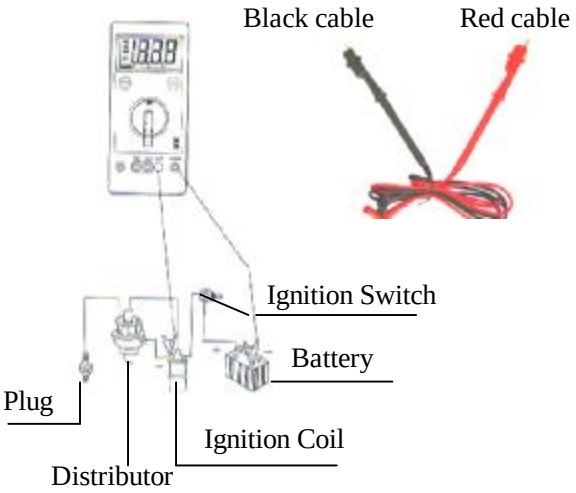
13. RPM Measuring

a. Insert the black lead into COM hole and the red lead into the hole with V Ω %.

b. Turn the switch to the TACH scale according to the engine cylinders.

c. Short the black lead to ground or the negative of the battery and the red lead to the low voltage terminal of the distributor or the negative of the ignition coil. See the following pictures.

d. Start the engine. The engine speed is the measured values times 10. The unit is rpm.



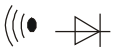
Picture for RPM testing

14. Mechanical Protection

The multimeter has a movable plate. It can protect error operation. The plate can move between the function and range knob. The mechanical protection is listed as following:

(The symbol ● means the hole is blocked. The black lead can insert into the hole)

Position of Switch	The hole blocked		
	V Ω %	mA	20A
Voltage for DC and AC		●	●
Current over 20A for DC and AC	●		●

Current within 20A for DC and AC	●	●	
Resistance Ω		●	●
		●	●
Triode hFE parameter	●		●
Duty		●	●
Temperature ℃	●		●
Dwell，rpm		●	●

The Function/Range knob cannot move if you forget to pull out the testing leads.

Pull out the testing leads before turning the Function/Range knob otherwise the mechanical protection will be damaged.

15. Selecting the angel of the Multimeter

A protection mould provided for the protection. You can adjust the holder for the readings at different angles.

Maintenance

Digital automotive tester 2201 is an accurate tool. It should be kept carefully.

1. Do not test the DC voltage higher than 1000V or AC voltage higher than 700V with digital automotive tester 2201.
2. Pull out the testing leads before turn the Function/Range knob. Otherwise, the mechanical protection will be damaged.
3. Do not use the digital automotive tester 2201 if the back cover is not in the right position.

4. Pull out the testing leads or turn off the power before exchange a new battery. Turn out the screw and push the battery cover. Take down the battery cover and change a new battery with the same specification.
5. Pull out the testing leads or turn off the power before exchange the fuse. Turn out the screw and open the back cover of the multimeter. Change a new fuse with the same specification. Close the back cover and screw it.
6. The specification of the fuse is 0.2A/250V
7. Take out the battery and put it in dry and ventilation places if you DO NOT use the multimeter for a long time.
8. DO NOT try to change the interior circuit

Accessory

1. User Manual
2. Quality Certificate
3. Protection Mould
4. Testing Leads
5. Type K Thermal Coupler

Option

SMD clamper: can be used to test the parameter of the resistance, capacitance, inductance, and transistor.

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This manual tells you how to use the unit to perform diagnostic test and find possible locations of vehicle problems. It does NOT tell you how to correct the problems. Consult your OEM vehicle service manual for repair instruction. If you experience a problem obtaining service data from a vehicle, it may be due to a vehicle manufacturing design change. Vehicle manufacturers now introduce new product lines year-round. To obtain test data on a mid-year vehicle, you may need to program the tester to the next model year available in the software cartridge, not the actual VIN year of the vehicle being tested.

Order Information

Replaceable and optional parts can be ordered directly from your AUTOBOSS authorized tool supplier. Your order should include the following information:

1. Quantity
2. Part number
3. Item description

Customer Service

For any quality problems, please contact the local distributor or direct contact Autoboss Tech. Inc.

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