

MAINTENANCE CASE BOOK

– Electric Tester for Car Maintenance Engineers –

The all-purpose automotive electric problem solver!

When you get the Terminator,
you can throw oscilloscopes out!

Terminator
T-7205J



GP G-Auto

R&D In Automotive Electronics



Digital Pulse Tester

Simple to use Terminator makes trouble-shooting fast, easy, and accurate!

Advantages

Watch the pulse with the LEDs.

The effective activation of 9 LEDs displays all automotive signals.

Voltage, Frequency, or duty modes.

You can toggle between the voltage, frequency, or duty modes at the push of a button while the Terminator is in use.

Simple test for checking all circuits.

Powerful logic probe can check for open circuits, short circuits, and other poor electrical connections.

Safe for the most sensitive components.

The state-of-the-art technology used in the Terminator lets you work safely with all sensors and car ECUs.

Applications

1. Starting & Charging System

- o Starter Motor
- o Test Battery Load
- o Alternator Capacitor
- o Test Charging Signal

3. Sensors

- o Power & Ground of Sensors
- o MAP Sensor
- o O₂ Sensor
- o RPM Sensor
- o Air Flow Sensor
- o Crank Angle Sensor
- o Vehicle Speed Sensor
- o No.1 TDC Sensor
- o Water Temperature Switch
- o Pulse Generator(A/T)
- o Idle Switch
- o ABS-Wheel Speed Sensor
- o Throttle Position Sensor
- o Cam Position Sensor
- o Noise Filter

2. Electric Relay & Actuator

- o Window Motor
- o Windshield Wiper Motor
- o Door Lock Actuator
- o Trunk Lock
- o Fuel Pump Motor
- o Stepping Motor
- o ISA(Idle Speed Actuator)
- o TR(Power Transistor)
- o Fuel Injector
- o Main Control Relay

- o Air Temperature Sensor
- o Barometric Pressure Sensor
- o Inhibitor Switch(A/T)
- o Water Temperature Sensor
- o Solenoid Valve(A/T)
- o Electric Horn
- o Electric Fan Switch
- o Tachometer



Model. T-7205J

Trouble and/or Symptom

Speedometer does not work during normal driving.

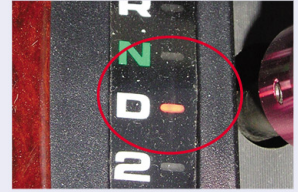
Diagnostic Procedure



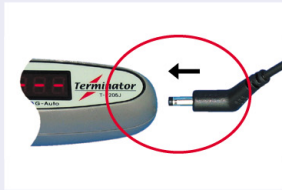
1. Raise the vehicle on a lift, allowing the wheels to move freely.



2. Start the engine.



3. Put the car into gear and let the tires rotate freely.



4. Connect the ground cable to Terminator.

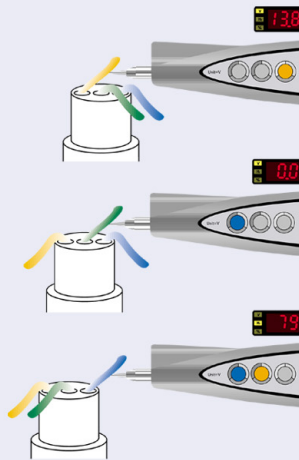


5. Connect the ground clamps to the car body.



6. Turn on the Terminator and touch the speedometer wiring with the probe.

When the Terminator is working normally



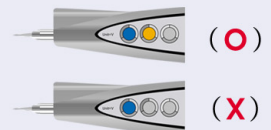
1. **Check the sensor power** : As in the picture, Terminator 's 3rd lamp turns ● and the alternator voltage appears on the numeric display.

2. **Check the sensor ground** : As in the picture, Terminator 's 1st lamp turns ● and 0.0 V appears on the numeric display.

3. **Check the sensor output** : As in the picture, the 1st ● and 2nd ● lamps on Terminator 's display blink alternately, indicating that pulse is the present mode. At this time, if you push the selection button (⊖) one time, the mode will be changed to frequency measurement mode [Hz] and the present speed will appear on numeric display.

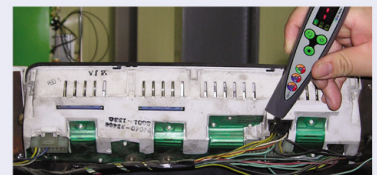
When the Vehicle Speed Sensor has some trouble

- As in the normal state above, the speed sensor power and ground show the same state on the Terminator.
- Check the sensor output : Different from the normal (alternately blinking) state, one lamp remains fixed at a constant color (no blinking).



When the Speedometer has some trouble

- Remove the dashboard, and touch the Terminator 's probe to the speedometer wiring on the back of the dashboard.
- If the sensor output is the same as in the normal state, i.e., the 1st ● and 2nd ● lamps blink alternately, this indicates that the signal before the dashboard is normal. If this occurs, we can then judge that there is a problem with the speedometer itself.

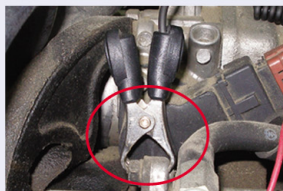


Trouble and/or Symptoms

A car that suddenly stops running, and there is no spark from the spark plug.

If the power transistor overheats it will often show some trouble symptoms, but when it cools down it works normally. In this case, technicians have difficulty in identifying the source of the trouble. To overcome this problem, start the engine, and wait for a while. After the engine is sufficiently warm, turn off the engine and immediately check the power transistor.

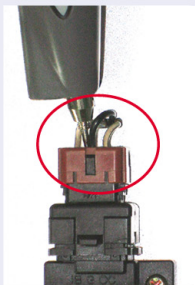
Diagnostic Procedure



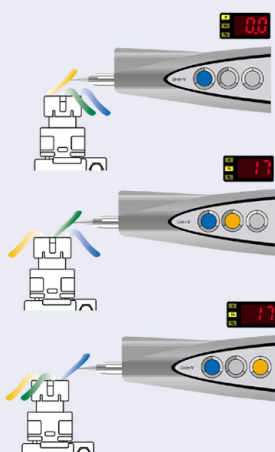
1. Turn on the Terminator, and the ground clamps to the car body.



2. Turn the key to engage the starter, and check each wire on the power transistor.



When the power transistor is working normally



1. Check the power transistor ground : As in the picture, Terminator's 1st lamp turns ●, and 0.0 V appears on the numeric display.

2. Check the power transistor base : The base is the signal from the ECU. As in the picture, the 1st ● and 2nd ● lamps on Terminator's display blink alternately, indicating that 'pulse' is the present mode. At this time, pushing the Terminator's selection button ● one time will change the mode to 'frequency measure' [Hz], and the car's present speed frequency appears on the numeric display.

3. Power transistor collector signal : The collector is the signal from the power transistor to negative (-) pole of the ignition coil, and the pulse range is 0 to 12 V. As in the picture, the 1st ● and 3rd ● lamps on Terminator's display blink alternately, indicating that 'pulse' is the present mode.

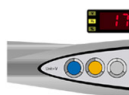
When the power transistor has some trouble

Power TR ground



normal

Power TR base



normal

Power TR collector



normal

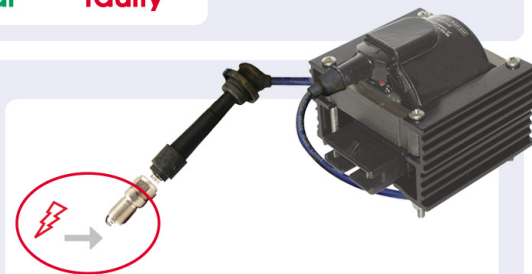
faulty

Ground and base are the same as in the normal state, but the 3rd light turns green ●.

When the ignition coil has some trouble

If the ground, base, and collector signals are indicating normal conditions, but there's no secondary voltage (spark) from the ignition coil, then we can determine that the trouble is from the ignition coil.

※ If you can see a ⚡ (spark) the ignition coil is working normally, but if you can't then it's faulty.

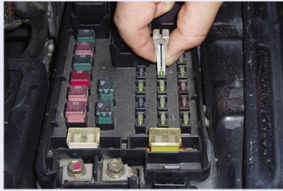


Trouble and/or Symptoms

The engine doesn't start.

after the car has been parked for a long time, or on a cold morning.

Diagnostic Procedure



1. Remove the ECU fuse, so fuel is not injected into the system.



2. Connect the ground clamps to the battery's negative (-) pole.



3. Touch the Terminator's probe to the battery's positive (+) pole.

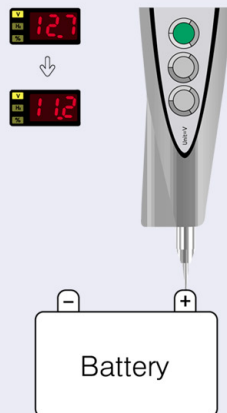


4. Try to start the engine for about 5 seconds.



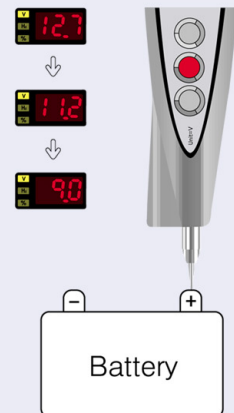
5. The technician should watch the Terminator's lamps and for any change in voltage.

When the battery is working normally



The voltage will go down as time goes on, and Terminator's 3rd lamp turns green ●.

If the battery has some trouble



As time goes on, the voltage will go down under 9.2 V, and Terminator's 2nd lamp turns red ●.

Repair Tip

No matter how long you try to charge it, the faulty battery will not charge normally. Replacing the battery is recommended.

Trouble and/or Symptoms

The window motor does not work normally.

Diagnostic Procedure



1. Remove the door trim.



2. Turn the ignition key to the ON position.



3. Connect the ground clamps to the car body.

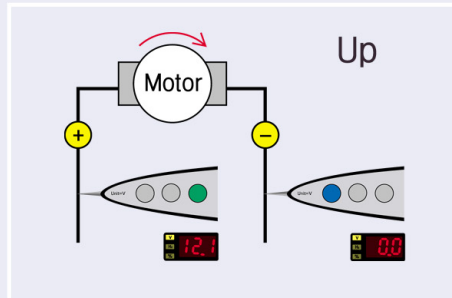


4. Touch the window motor wiring with the probe, and then operate the window switch.

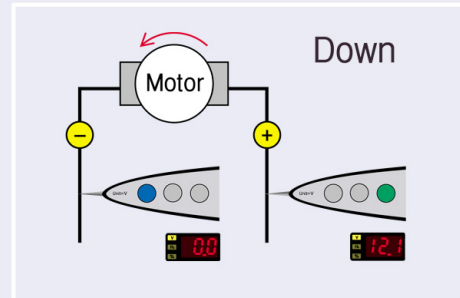


5. Check for the trouble area by watching the Terminator's lamps and any change in voltage.

When the window motor is working normally (Normal state)



When the window goes up.



When the window goes down.

When there is a problem with the motor

The change in Terminator's lamps is the same as in the normal state, but the motor is not activated.

When there is a problem with the switch

When you operate the switch, the Terminator's lamp remains fixed at a constant color (no blinking), different from the normal state.

Trouble and/or Symptoms

The engine doesn't start and the operation of the injector is in doubt.

Diagnostic Condition

Turn the ignition key to engage the engine.

Diagnostic result

- Power wire: Battery + Voltage.



12.0 Volt

- Drive Signal wire: 0~12 V Pulse signal.



16 Hz

Trouble and/or Symptoms

Neither the injector drive signal or ignition signal are displayed.

Diagnostic Condition

Turn the ignition key to engage the engine.

Diagnostic result

- Power wire: Battery + Voltage.



12.0 Volt

- Ground wire: Battery - Voltage.



0.0 Volt

- Crank Position Sensor: 0~5 V pulse signal having high frequency.



80 Hz

- No.1 TDC Sensor: 0~5 V signal having relatively low frequency.



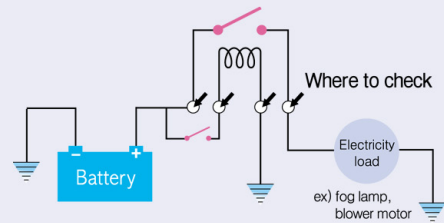
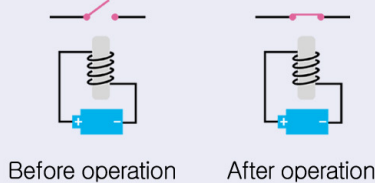
20 Hz

There are various kinds of relays used in automotive vehicles to control electricity. In most cases, if a problem arises, a mechanic examines each terminal with their tester after removing the relay from its socket to inspect the relay circuit. However, if the mechanic does not have the appropriate shop manual, or enough experience in dealing with electric circuits, he often encounters significant difficulties in determining the exact problem.

● To make a T-Connector.

The relay principal

The relay operates on fundamental electromagnetic principles. This means that when an electromagnetic coil is electrified, it becomes magnetized. It is one way of operating a switch.



Since the relay is like an intersection that is charged with electricity, when you check relay circuits, it would be very convenient if you could check all shorts, open contacts, and bad contacts at one place.

The necessity of T-Connector for the relay

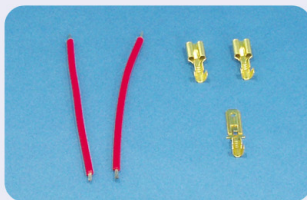
The best way to effectively check relay circuits is to check them while they are still connected to the socket, though this is also the most inconvenient method. You typically need to unfasten the socket assembly, and then turn it over to check wires, on account of several relays usually being placed on one socket assembly.



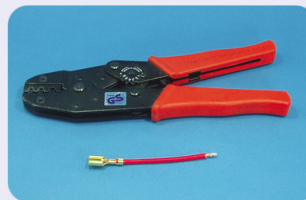
However, the above processes are accompanied by supplementary work, and when you turn the assembly over all wires are then located in the opposite direction to their normal orientation. In this case, use of T-Connector can make the diagnosis easier and more efficient.

Preparing T-Connector for a relay

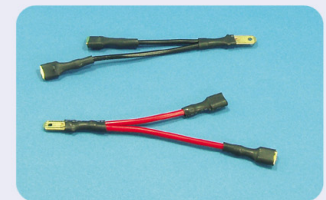
Prepare 10 cm lengths of wires and terminals as shown in the picture below.



1. Peel 5 mm from both ends of the wires.



2. Using a tool, connect the terminals and wires.



3. Insulate the terminals by using a contraction tube: make a small-sized T-Connector for a relay in the same way.

When a person turns on their air-conditioner or heater, and it does not work, the car is brought into a repair shop. In this case, the blower, blower switch, and register of the car have previously been replaced, but the problem persists.

Let's check an actual vehicle.

Preparation for check

1. Put the T-connector into the blower relay.



2. Operate the blower switch, then prepare Terminator to check each checkpoint.

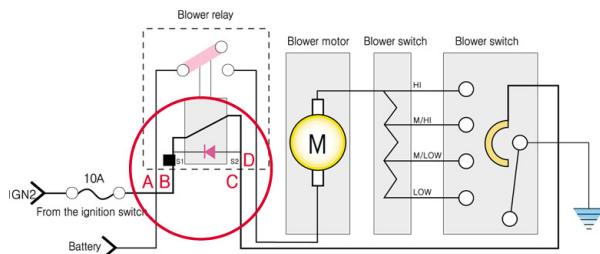


Check and Diagnosis

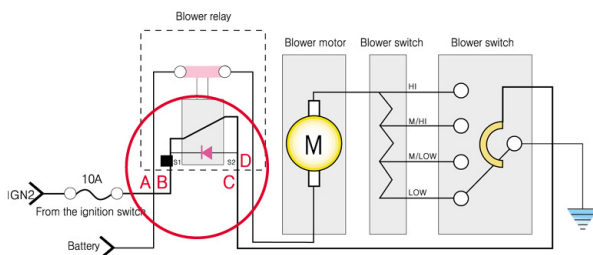
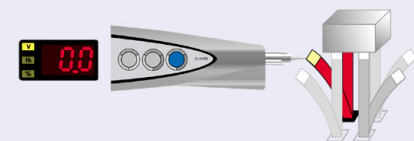
A. Ensure that the power supplied from the battery is on 'Stand-by' at all times.



B. When you turn the ignition key to the 'ON' position, +power is seen.



C. It is verified that the ground is normal whenever the blower switch is operated.



D. When the blower switch is operated, + power is verified, but when the blower switch is turned off, 'Terminator' indicates that the circuit is still open (---). Therefore, it is diagnosed that the wire between the blower motor and the D terminal of the relay is disconnected and needs to be repaired.



LED lamps

The three LED lamps indicate voltage; the 9 different colors represent 9 levels of voltage. This range of LED colors is the most important feature of the Terminator.

Voltage Mode

Bottom Lamp (Voltage range : 0.0 V ~ 2.5 V)

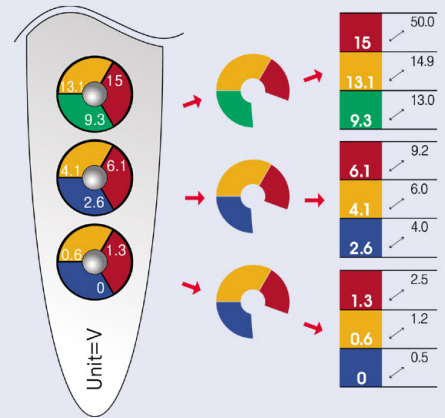
- When the measured value is between 0.0 V and 0.5 V, the bottom LED will turn ● blue.
- When the measured value is between 0.6 V and 1.2 V, the bottom LED will turn ● orange.
- When the measured value is between 1.3 V and 2.5 V, the bottom LED will turn ● red.

Middle Lamp (Voltage range : 2.6 V ~ 9.2 V)

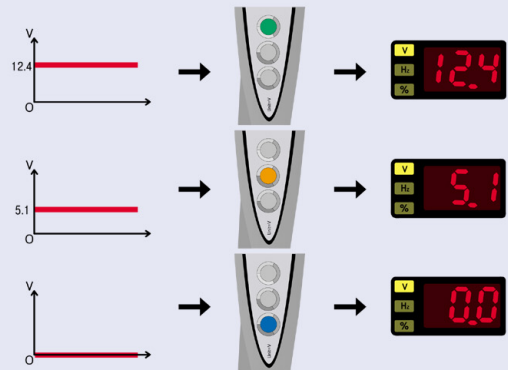
- When the measured value is between 2.6 V and 4.0 V, the middle LED will turn ● blue.
- When the measured value is between 4.1 V and 6.0 V, the middle LED will turn ● orange.
- When the measured value is between 6.1 V and 9.2 V, the middle LED will turn ● red.

Top Lamp (Voltage range : 9.3 V ~ 15 V)

- When the measured value is between 9.3 V and 13.0 V, the top LED will turn ● green.
- When the measured value is between 13.1 V and 14.9 V, the top LED will turn ● orange.
- When the measured value is between 15 V the top LED will turn ● red.

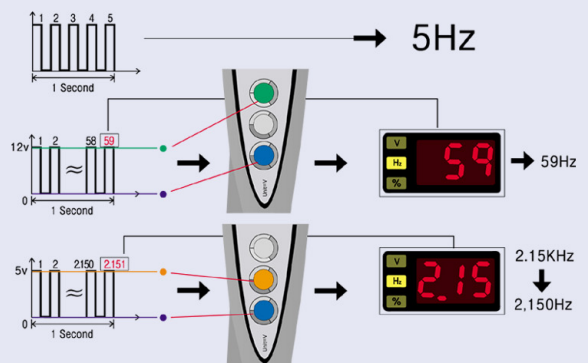


- › The voltage can also be read on the numeric display screen.
- › The numeric display ranges from - 45 V to +50 V. If the measured value is lower than - 45 V or higher than +50 V, the numeric display will display "OL".
- › If the voltage is between - 9.9 V and +50 V, the display will be given to one decimal point. If the voltage is under +9.9 V, it will be rounded to the nearest whole number.



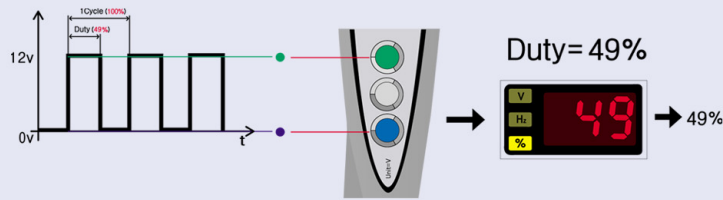
Frequency Mode

- The frequency is the number of pulses per second (Unit: Hz).
- The numbers indicated in the display are the measured frequency up to 999 Hz.

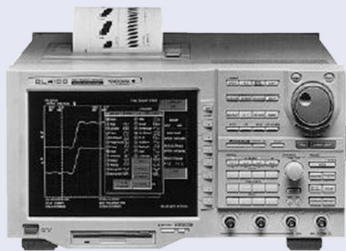


Duty Mode

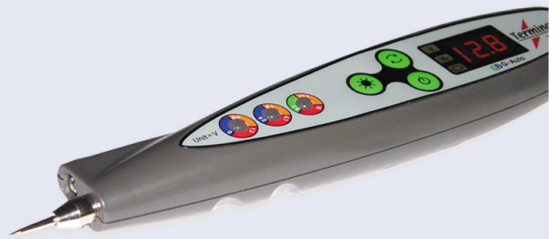
- The positive period of one pulse cycle is called the duty (Unit: %)
- The numbers indicated in display are the measured duty ranging between 1%~99%



Product Benefits



LAB-SCOPES



DIGITAL PULSE TESTER
(Terminator T-7205J)

Hard to use	Easy to use
Complicated operation and trouble analysis	Easy, fast and accurate trouble shooting
High price	Low price

Name of the Parts

1. Probe & Probe Holder
2. Light
3. LED Display
4. Light Switch
5. Function Switch
6. Power Switch
7. Voltage (V)
8. Frequency (Hz)
9. Duty (%)
10. Numeric Display
11. Ground Clip
12. Extension Cord

