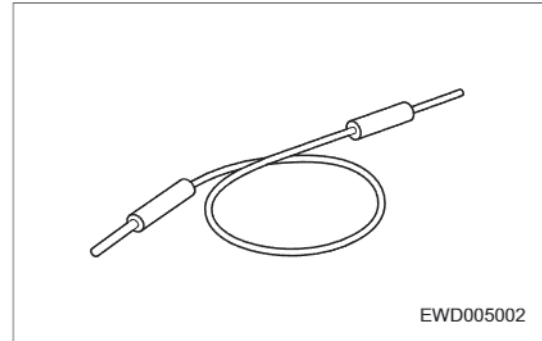


Troubleshooting

Electrical Malfunction Troubleshooting Tool

1. Jumper Wire

Jumper wire is used to establish temporary circuits. Connect jumper wire between terminals of the circuit to bypass switches.



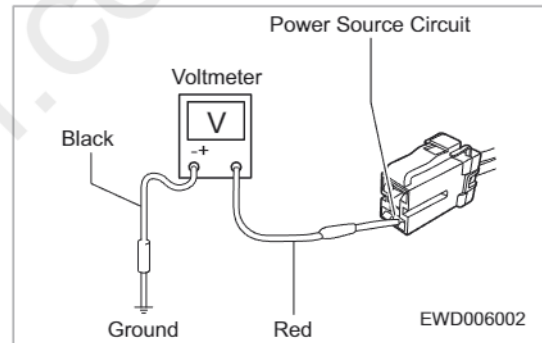
03

WARNING

- Do not connect jumper wire between power source end and body ground, otherwise wire harness or electrical components may be damaged.

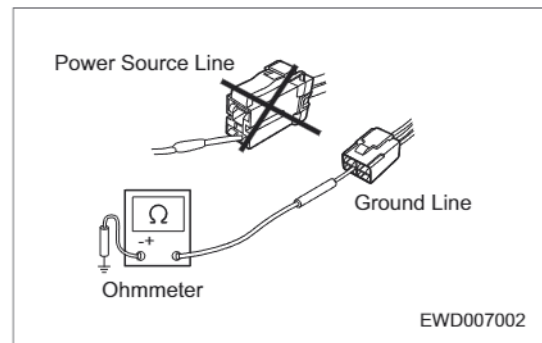
2. Voltmeter

A voltmeter is used to measure voltage in a circuit. Its measurement range should be higher than 15 V. Voltage is measured by connecting the positive probe (red) of voltmeter to positive lead of part to be tested and the negative probe (black) to the negative lead or body ground.



3. Ohmmeter

An ohmmeter is used to measure the resistance between two points in a circuit or to check the circuit for open or short.



WARNING

- When applying voltage to the circuit, do not connect the ohmmeter to circuit, otherwise the measurement data may be inaccurate or even cause damage to ohmmeter.

Electrical Malfunction Troubleshooting

Wire harness Troubleshooting

The following 6 steps will help troubleshoot the wire harness. Be sure to check any non-genuine components added to the vehicle before performing any diagnosis. If the vehicle is equipped with such components, disconnect it to confirm that the added components are not the cause of fault.

To troubleshoot the wire harness, perform the following steps:

1. Confirm the malfunction.
2. Look for any related faults (by checking components in the same circuit).
3. Analyze symptoms (use a circuit diagram to determine circuit layout, areas most likely to fail, and areas to proceed with diagnosis).
4. Isolate the failure area.
5. Repair the failure area.
6. Check if it is working properly (in this step, check if all items of repairing circuit are working properly).

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Voltage Test

1. Establish the condition that voltage is present at the checkpoint.

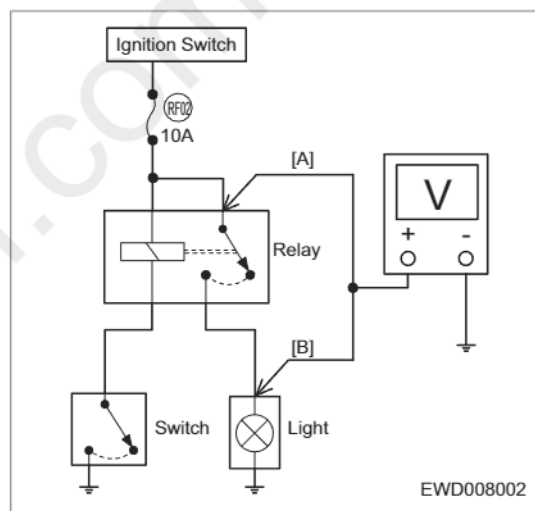
Example:

[A] – Ignition switch ON

[B] – Ignition switch and switch ON

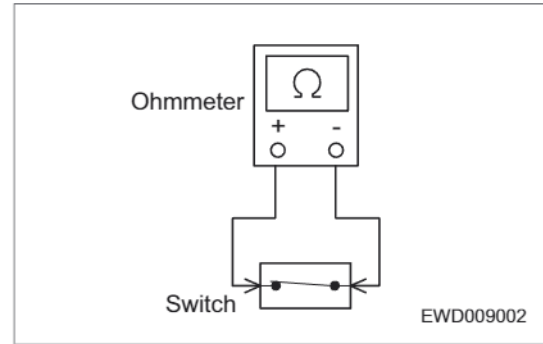
2. Use a voltmeter to connect the negative probe (black) to a good ground point or negative battery terminal, and connect the positive probe (red) to the connector or component terminal.

A test lamp may be used instead of a voltmeter during inspection.



Circuit Continuity Test

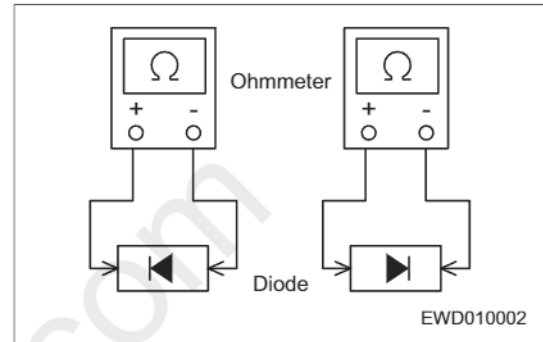
1. Turn off all electrical equipment and the ignition switch, and disconnect the battery negative cable.
2. Remove the tested circuit.
3. Connect the two probes of ohmmeter to both ends of tested circuit, and check the circuit conductivity (small resistance indicates good circuit conductivity).



If the circuit has diodes, replace with two probes and check again.

Connect the negative probe (black) to the positive side of diode. When the positive probe (red) is connected to the negative side, it may be continuity.

If the two probes are exchanged, they should be no continuity.



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Short Test

1. Measure and record battery voltage.
2. Pull out the fuse of tested circuit or disconnect the power supply end of tested circuit.
3. Connect the voltmeter positive probe (red) to the positive battery terminal, and the negative probe (black) to power supply end of circuit.
4. Check the voltage shown on the voltmeter. If voltage value of battery is displayed, it indicates that the test circuit short to ground.

A test lamp may be used instead of a voltmeter during inspection.

Electrical Repair

Wire Harness Repair

WARNING

- Measure the length of lead to be repaired and select a suitable substitute lead before repair.
- If there are several leads to repair, shake the repair part.

1. Strip 0.5 inch insulation layer from repair leads and substitute leads.
2. Connect the original lead to substitute lead using a heat shrinkable tube and compress metal core of heat shrinkable tube with a tool to securely connect the original lead to substitute lead.
3. Heat the heat shrinkable tube to shrink the outer rubber layer and ensure that the service area is well sealed.
4. Wrap the service lead with insulating tape.

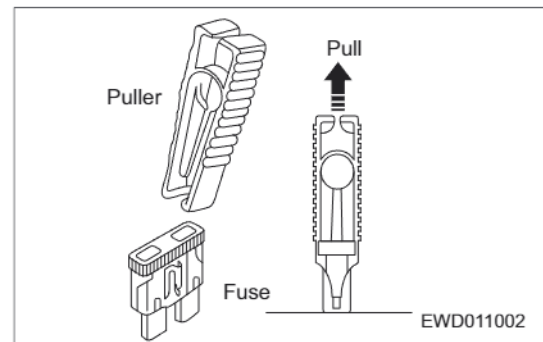
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Fuse Replacement

WARNING

- After replacing the fuse, perform a power-on test. If the fuse is blown again, check the corresponding circuit for short. If any electrical equipment or additional equipment that exceeds the rated current is installed, replace the fuse with a higher current.

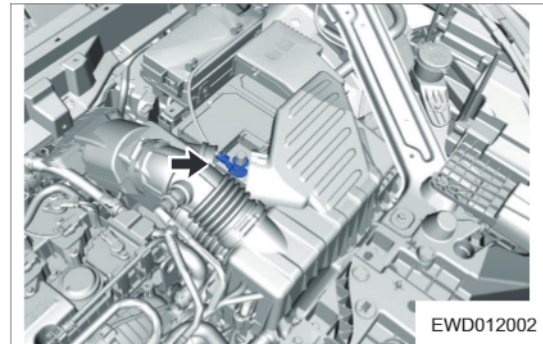
1. Turn off all electrical equipment and ENGINE START STOP switch before repair.
2. Remove the blown fuse with the fuse puller.
3. Replace with a new fuse with same specification.



Electrical Components

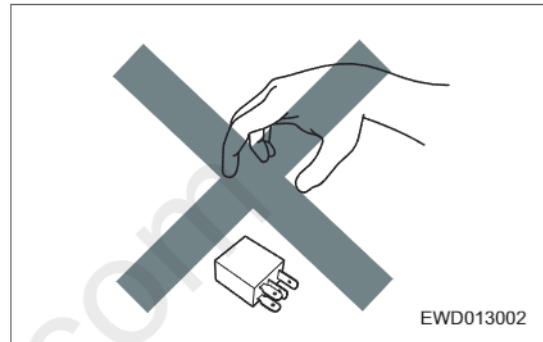
1. Battery Cable

Disconnect the negative battery cable (arrow) before repairing electrical components.



2. Sensors, Switch and Relay

Do not drop or knock sensors, switches or relays during maintenance to avoid damaging components.



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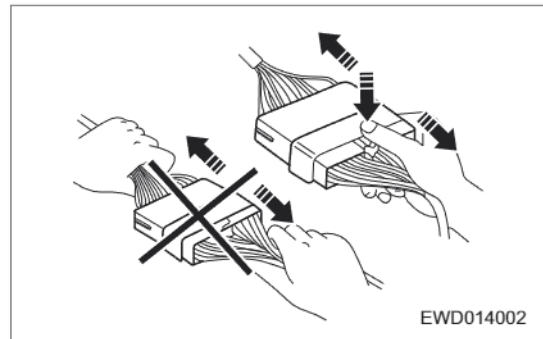
WARNING

- Use relays with same specifications as the original relay during replacement.

3. Connector

a. Disconnect the connector.

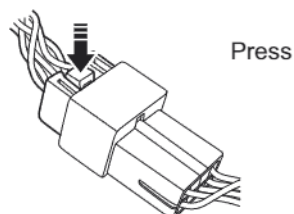
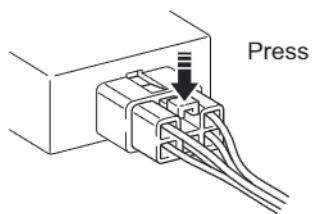
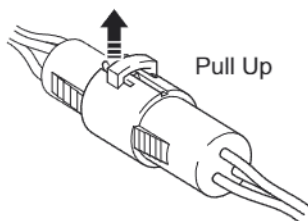
To pull away from the connector, pull the connector itself and press the connector clip to disconnect it.



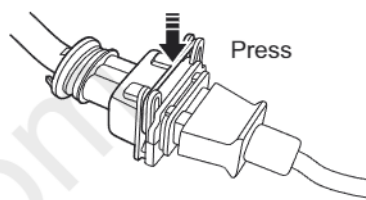
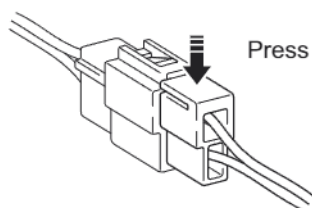
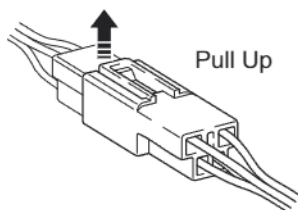
WARNING

- When disconnecting connectors, do not forcibly pull the wire harness to avoid damaging components.

There are many ways to secure the connector clip. The following illustration shows the common disconnection method.



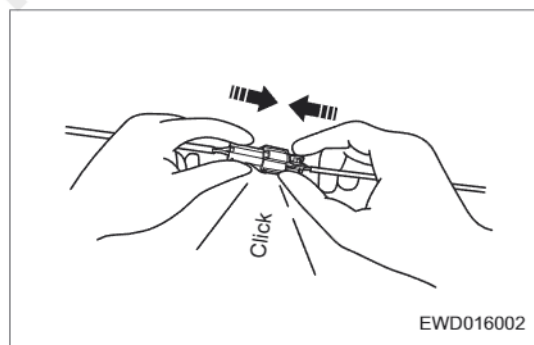
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b. Install the connector.

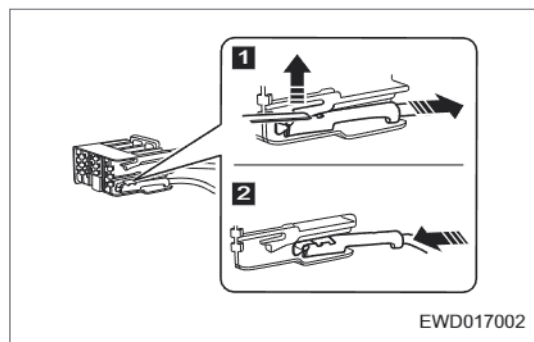
When the connector is installed in place, a “click” is heard.



EWD016002

c. Replace the connector terminal.

As shown in illustration (1), insert proper tool into the terminal to lift fixing clip, and then pull out terminal from back side. As shown in illustration (2), push the terminal from back of connector to ensure that the fixing clip is installed in place.



EWD017002

d. Check the connector terminal.

Gently pull a terminal wire harness to check if it is installed in place.

