

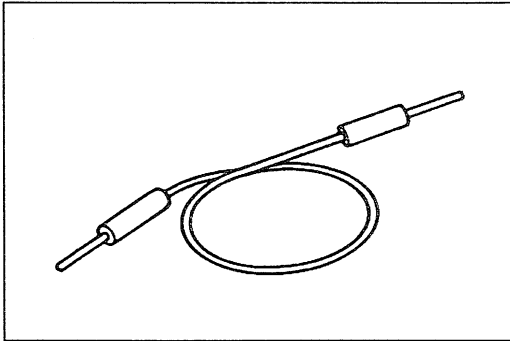
## ELECTRICAL TROUBLESHOOTING TOOLS

### TEST LIGHT

The test light, as shown in the figure, uses a 12V bulb. The two lead wires should be connected to probes. The test light is used for simple voltage checks and for checking for short circuits.

#### Caution

- Using a bulb over 3.4W when checking the control unit may damage the control unit.

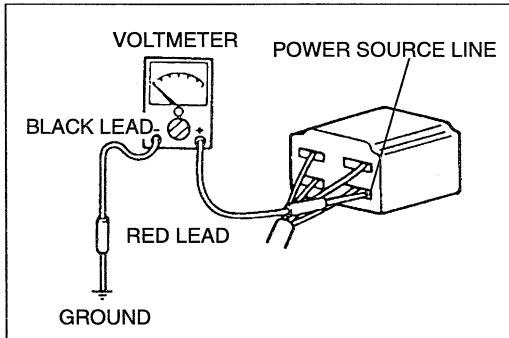


### JUMPER WIRE

A jumper wire is used to create a temporary circuit. Connect the jumper wire between the terminals of a circuit to bypass a switch.

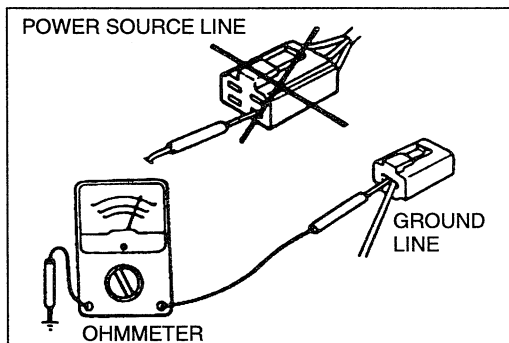
#### Caution

- Do not connect a jumper wire from the power source line to a body ground; this may cause burning or other damage to wiring harnesses or electronic components.



### VOLTMETER

The DC voltmeter is used to measure circuit voltage. A voltmeter with a range of 15V or more is used by connecting the positive (+) probe (red lead wire) to the point where voltage is to be measured and the negative (-) probe (black lead wire) to a body ground.

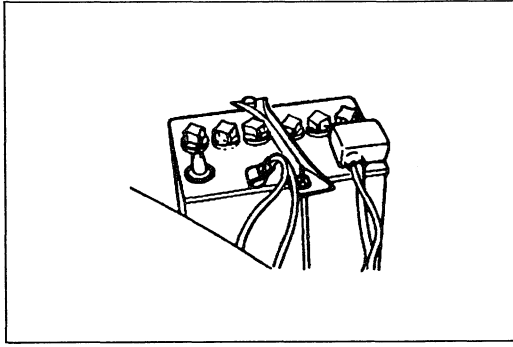


### OHMMETER

The ohmmeter is used to measure the resistance between two points in a circuit, and to check for continuity and short circuits.

#### Caution

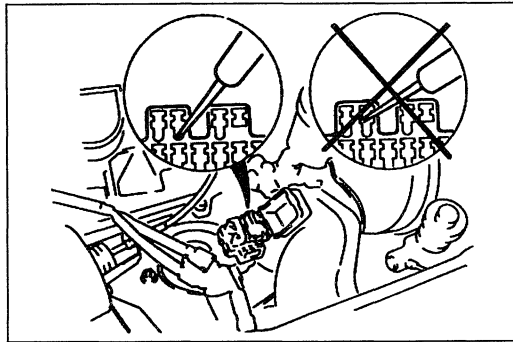
- Do not connect the ohmmeter to any circuit to which voltage is applied; this will damage the ohmmeter.



## ELECTRICAL PARTS

### BATTERY CABLE

Before disconnecting connectors or removing electrical parts, disconnect the negative battery cable.



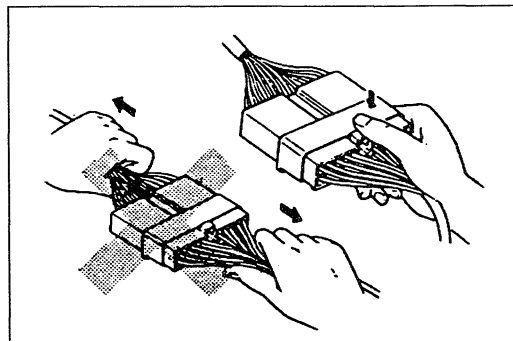
### CONNECTORS

#### Data Link Connector

Insert the probe into the service hole when connecting a jumper wire to the data link connector.

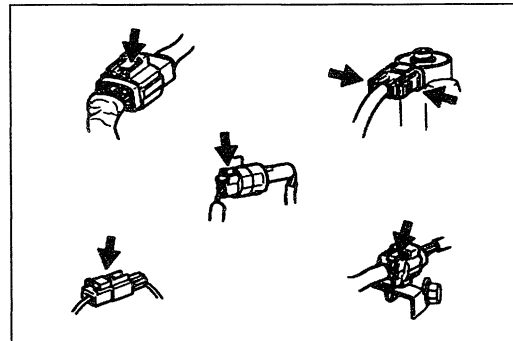
#### Caution

- Inserting a jumper wire probe into the data link connector terminal may damage the terminal.

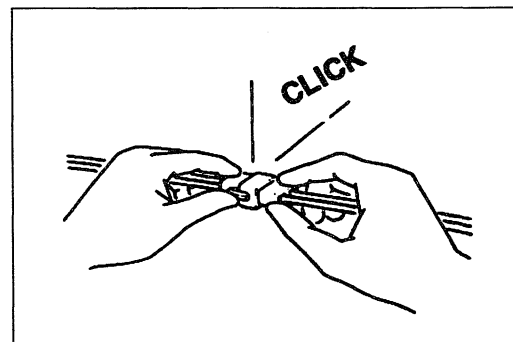


#### Disconnecting Connectors

When disconnecting two connectors, grasp the connectors, not the wires.

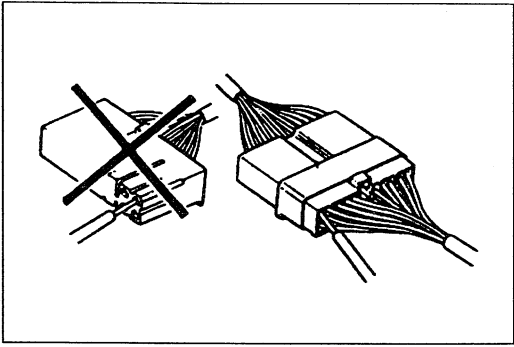


Connectors can be disconnected by pressing or pulling the lock lever as shown.

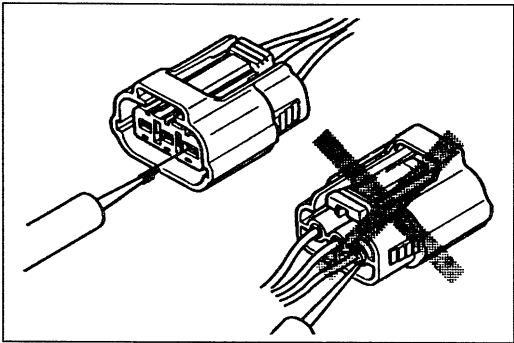


#### Locking connector

When locking connectors, listen for a click that will indicate they are securely locked.

**Inspection**

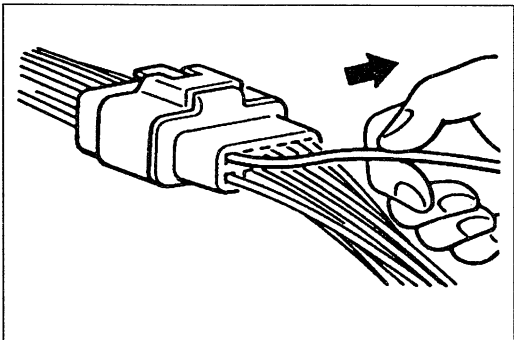
1. When a tester is used to check for continuity or to measure voltage, insert the tester probe from the wiring harness side.



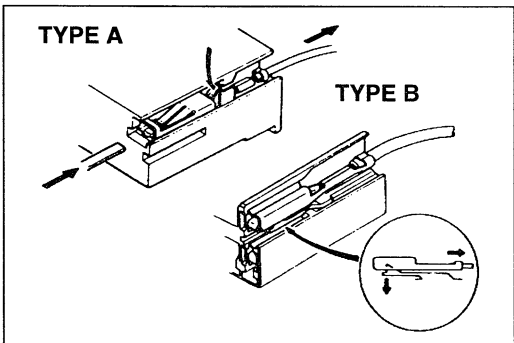
2. Check the terminals of waterproof connectors from the connector side, as they cannot be accessed from the wiring harness side.

**Caution**

- To prevent damage to the terminal, wrap a thin wire around the lead before inserting it into the terminal.

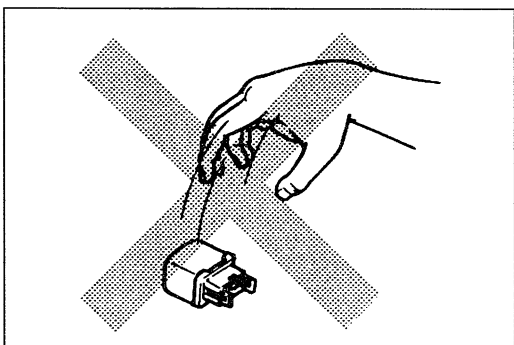
**TERMINALS****Inspection**

Pull lightly on individual wires to check that they are secured in the terminal.

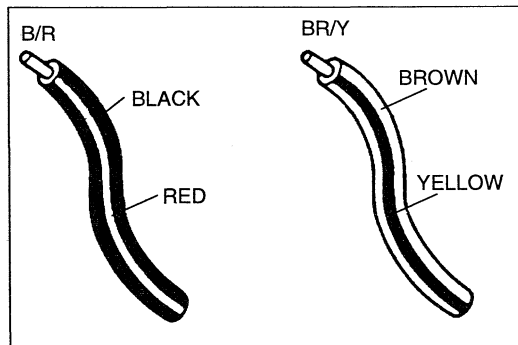
**Replacement**

Use the appropriate tools to remove a terminal as shown. When installing a terminal, be sure to insert it until it locks securely.

Insert a thin piece of metal from the terminal side of the connector, and then, with the terminal locking tab pressed down, pull the terminal out from the connector.

**SENSORS, SWITCHES, AND RELAYS**

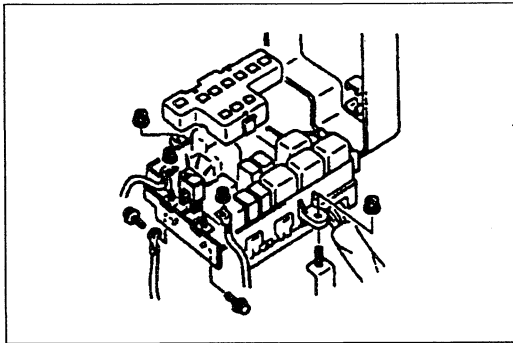
Handle sensors, switches, and relays carefully. Do not drop them or strike them against other objects.

**WIRING HARNESS****Wiring color codes**

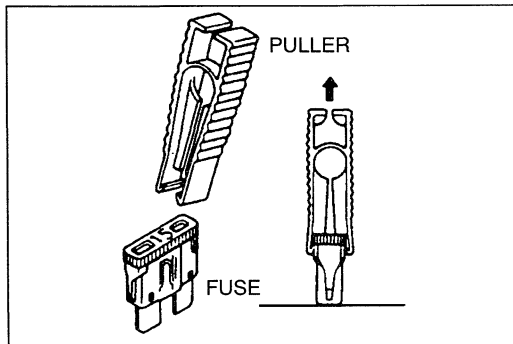
Two-color wires are indicated by a two-color code symbol.

The first letter indicates the base color of the wire and the second the color of the stripe.

CODE	COLOR	CODE	COLOR
B	Black	O	Orange
BR	Brown	P	Pink
G	Green	R	Red
GY	Gray	V	Violet
L	Blue	W	White
LB	Light Blue	Y	Yellow
LG	Light Green	—	—

**MAIN FUSE BLOCK****Cartridge Fuse (100A)****Removal / Installation**

1. Disconnect the negative battery cable.
2. Open the main fuse block lid.
3. Remove the bolts.
4. Remove **MAIN 100A** fuse.
5. Install in the reverse order of removal.

**FUSE BLOCK****Removal / Installation**

1. Remove the fuse block cover.
2. Use the puller found on the fuse block cover to remove the fuses. If one or more of the fuses are burnt, check for a short in the harness.

**Caution**

- Determine and correct the cause of the burnt fuse before replacing it. If the fuse is replaced before doing this, it may burn again.

3. Install in the reverse order of removal.