

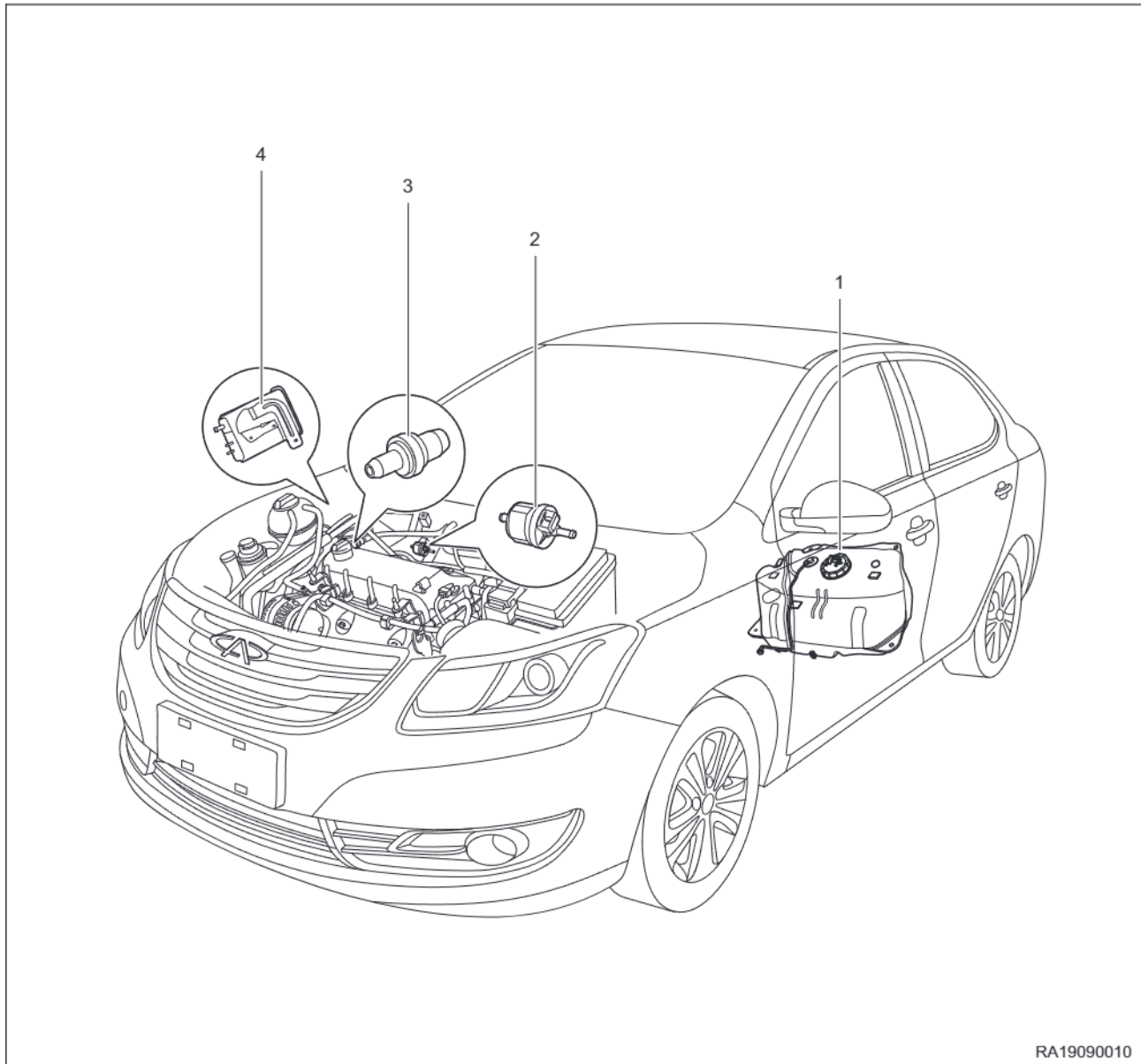
# SQR477F EMISSION CONTROL SYSTEM

|                                |             |                                    |              |
|--------------------------------|-------------|------------------------------------|--------------|
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# GENERAL INFORMATION

## Description



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|                        |                                                |
|------------------------|------------------------------------------------|
| 1 - Fuel Tank Assembly | 2 - Activated Charcoal Canister Solenoid Valve |
| 3 - PCV Valve          | 4 - Activated Charcoal Canister                |

The emission control system recovers and burns the fuel vapor to prevent the vapor in the fuel tank from being discharged into the atmosphere. It monitors the oxygen content in the exhaust gas, so as to guarantee the maximum efficiency of the catalyst assembly in converting the HC, CO and NOx in the exhaust gas.

The activated charcoal canister plays an important role in the emission control system. The activated charcoal canister can be used to absorb and filter the moisture and fuel vapor. The fresh air enters the bottom of activated charcoal canister while the fuel vapor enters the top of activated charcoal canister through the pipe. When the engine is stopped, the fuel vapor and fresh air will be stored in the activated charcoal canister. When the canister solenoid valve opens, the fuel vapor will enter the intake manifold to burn.

The oxygen sensor consists of upstream oxygen sensor and downstream oxygen sensor. The upstream oxygen sensor is installed on the exhaust manifold, and the downstream oxygen sensor is installed on the main catalyst assembly. The oxygen sensor can detect the oxygen content in the exhaust gas, and determine whether the combustible air-fuel mixture is completely burnt out or not, so as to guarantee the maximum efficiency of the catalyst assembly in converting the HC, CO and NOx in the exhaust gas.

## Specifications

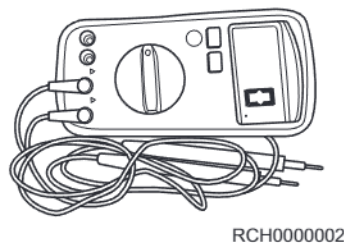
### Torque Specifications

| Description                                                     | Torque (N·m) |
|-----------------------------------------------------------------|--------------|
| Activated Charcoal Canister Bracket Fixing Bolt                 | $7 \pm 1.5$  |
| Connecting Bolt Between Activated Charcoal Canister and Bracket | $7 \pm 1.5$  |
| Exhaust Manifold Heat Insulator Fixing Bolt                     | $25 \pm 5$   |
| Upstream Oxygen Sensor                                          | $45 \pm 5$   |
| Downstream Oxygen Sensor                                        | $45 \pm 5$   |

## 09 Tool

### General Tool

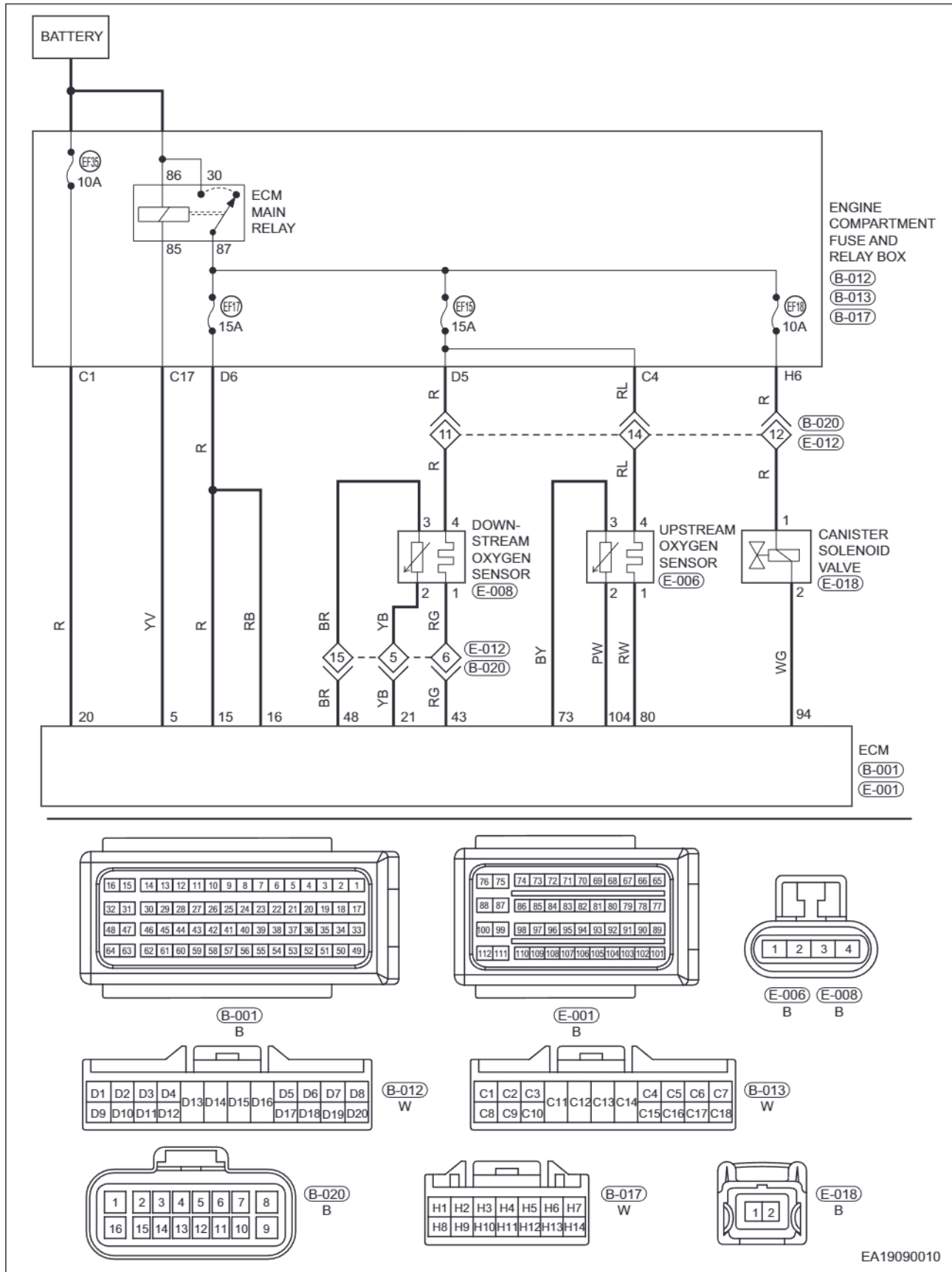
Digital Multimeter



RCH0000002

# Circuit Diagram

## Emission Control System



## DIAGNOSIS & TESTING

### Leakage Inspection

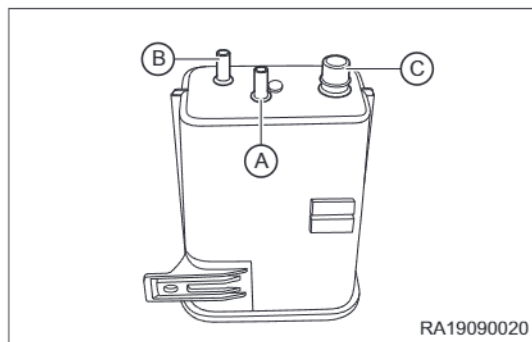
Visually check that the hoses, connections and gaskets have no cracks, leaks or damage.

#### CAUTION

- Removal of the engine oil dipstick, filler cap, PCV hose and other components or other problems in them may cause the engine to run improperly.
- Air suction caused by disconnections, looseness or cracks in the intake system pipes related to throttle assembly will result in engine failure or abnormal operation. Replace the parts as necessary.

### Activated Charcoal Canister Inspection

1. Close port C and blow compressed air into port A, check that the air flows from port B. If the result is not as specified, replace the canister.
2. Close port C and blow compressed air into port B, check that the air flows from port A. If the result is not as specified, replace the canister.



### Fuel Tank Cap Inspection

1. Visually check that the fuel tank cap assembly is not deformed or damaged.
2. If the result is not as specified, replace the fuel tank cap.

# ON-VEHICLE SERVICE

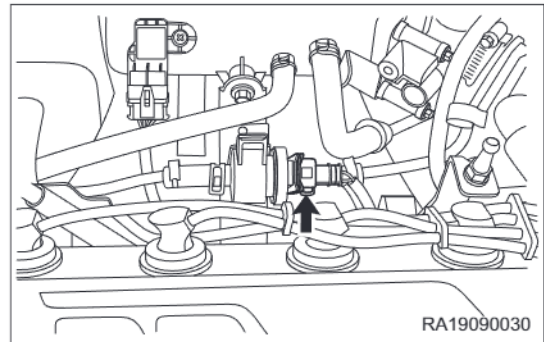
## Activated Charcoal Canister Solenoid Valve

### Removal

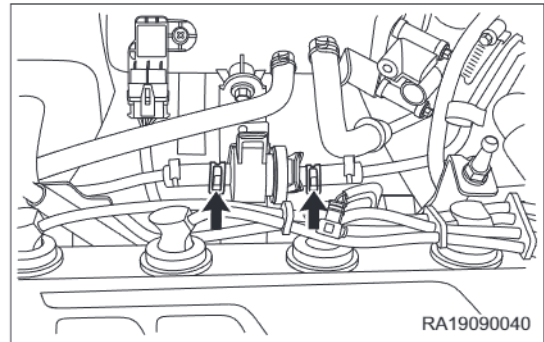
#### CAUTION

- Before removal, mark the air inlet and outlet hoses to avoid confusion.

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the activated charcoal canister solenoid valve.
  - a. Disconnect the canister solenoid valve connector (arrow).



- b. Disengage the elastic clamps (arrow) and disconnect both ends of canister solenoid valve from the hose.



#### CAUTION

- Positioning distance from hose end to clamp is 3 - 5 mm.

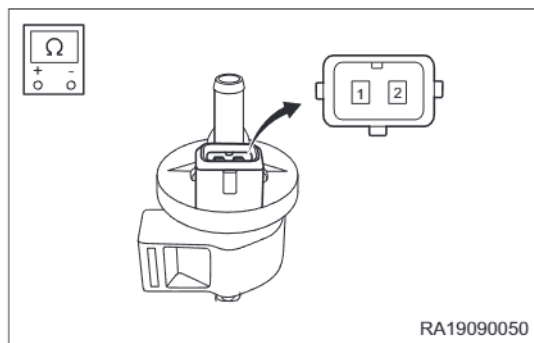
- c. Remove the canister solenoid valve from the bracket.

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## Inspection

Measure the resistance between the 2 pins of canister solenoid with the digital multimeter.

| Measurement Temperature | Specification ( $\Omega$ ) |
|-------------------------|----------------------------|
| 20°C                    | $26 \pm 4$                 |



## Installation

Installation is in the reverse order of removal.

## Activated Charcoal Canister Assembly

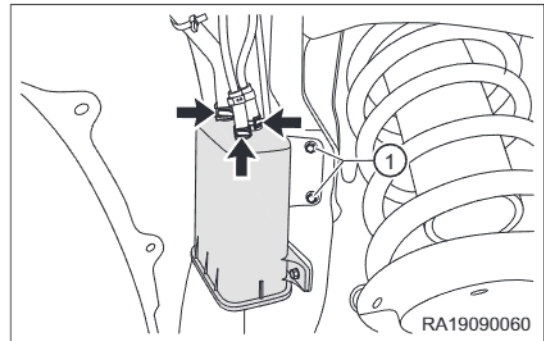
### Removal

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front right wheel house (See page 46-15).
4. Remove the activated charcoal canister assembly.
  - a. Loosen the elastic clamps (arrow), and disconnect the connection between activated charcoal canister and hoses.

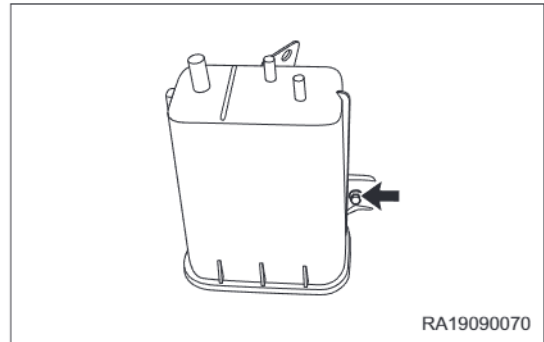
#### CAUTION

- Positioning distance from hose end to clamp is 3 - 5 mm.

- b. Remove 2 fixing bolts (1) from the activated charcoal canister bracket, and remove the activated charcoal canister with bracket assembly.  
(Tightening torque:  $7 \pm 1.5 \text{ N}\cdot\text{m}$ )



- c. Remove the connecting bolt (arrow) between the activated charcoal canister and bracket, and separate the activated charcoal canister and bracket.  
(Tightening torque:  $7 \pm 1.5 \text{ N}\cdot\text{m}$ )



#### ENVIRONMENTAL PROTECTION

- The abandoned activated charcoal canister should be handled by the specialized department according to local laws and regulations. Never discard it at will.

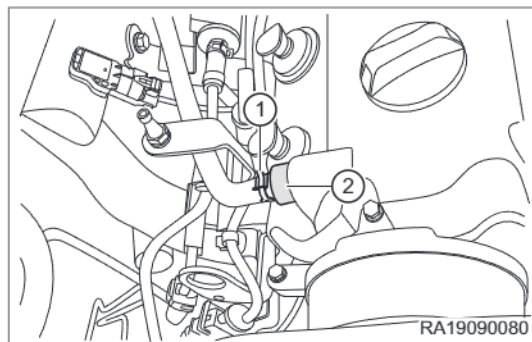
### Installation

Installation is in the reverse order of removal.

## PCV Valve

### Removal

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the PCV valve.
  - a. Disconnect the spring clamp (1) between the PCV valve side and hose.
  - b. Take out the PCV valve in the PCV valve rubber boot (2).



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- c. Remove the PCV valve rubber boot.

### Inspection

1. Install a clean hose to the PCV valve.
2. Check the PCV valve operation.
  - a. Blow air into the cylinder head side, and check that the air flows smoothly.

#### WARNING

- DO NOT suck air through the valve. Petroleum substances inside the valve are hazardous to your health.

- b. Blow air into the intake manifold side, and check that the air flows difficultly.

If the result is not as specified, replace the PCV valve.

3. Remove the clean hose from the PCV valve.

### Installation

Installation is in the reverse order of removal.

#### CAUTION

- Press the PCV valve rubber boot into the cylinder head cover, then press in the PCV valve.
- Positioning distance from hose end to spring clamp is 3 - 5 mm.

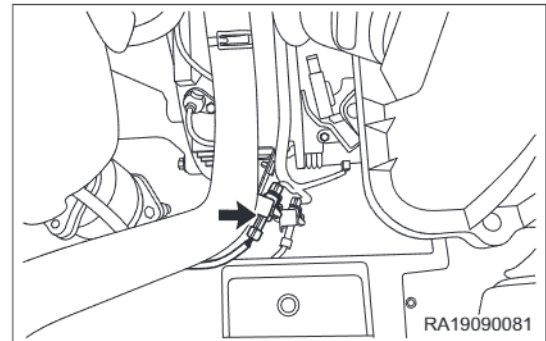
## Upstream Oxygen Sensor

### Removal

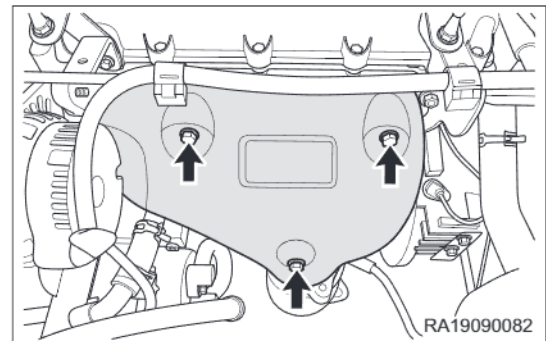
#### WARNING

- The temperature of exhaust system is very high when the engine is running. Before removal, you must make sure that the engine has shut off, and the exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.

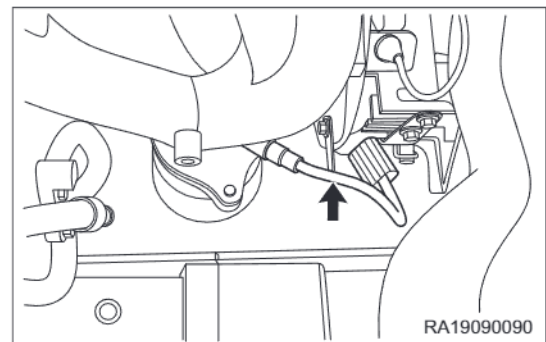
- Turn off all the electrical equipment and ignition switch.
- Disconnect the negative battery cable.
- Remove the engine trim cover.
- Remove the upstream oxygen sensor.
  - Remove and disconnect the upstream oxygen sensor connector (arrow) from bracket.



- Remove 3 fixing bolts (arrow) from the exhaust manifold heat insulator, and remove the exhaust manifold heat insulator.  
(Tightening torque:  $25 \pm 5 \text{ N}\cdot\text{m}$ )



- Remove the upstream oxygen sensor (arrow) from the exhaust manifold.  
(Tightening torque:  $45 \pm 5 \text{ N}\cdot\text{m}$ )



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## Inspection

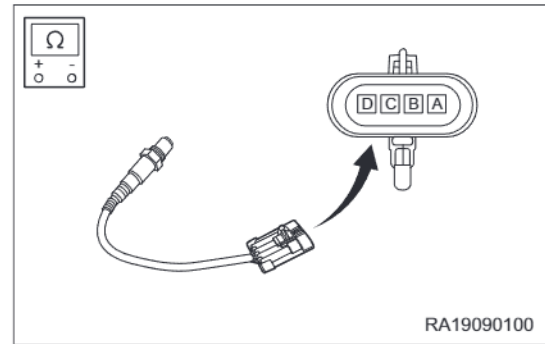
1. Measure the resistance of the upstream oxygen sensor with the digital multimeter.

| Multimeter Connection                                                             | Condition | Specification ( $\Omega$ ) |
|-----------------------------------------------------------------------------------|-----------|----------------------------|
| Pin C - Pin D                                                                     | 20°C      | 7 - 11                     |
| Pin A - Pin B<br>Pin A - Pin C<br>Pin A - Pin D<br>Pin B - Pin C<br>Pin B - Pin D | Always    | $\infty$                   |

If the result is not as specified, replace the upstream oxygen sensor.

## Installation

Installation is in the reverse order of removal.



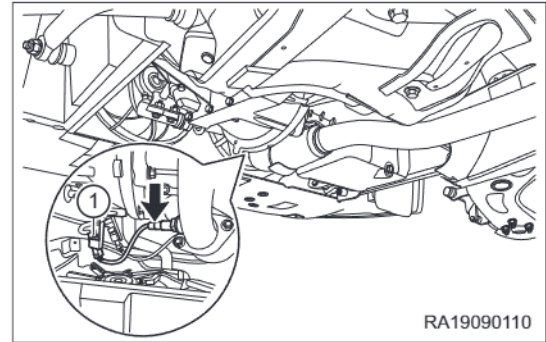
## Downstream Oxygen Sensor

### Removal

#### WARNING

- The temperature of exhaust system is very high when the engine is running. Before removal, you must make sure that the engine has shut off, and the exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.

- Turn off all the electrical equipment and ignition switch.
- Disconnect the negative battery cable.
- Raise the vehicle to the proper position.
- Remove the downstream oxygen sensor.
  - Remove and disconnect the downstream oxygen sensor connector (1) from bracket.
  - Remove the downstream oxygen sensor (arrow) from the main catalyst assembly.  
(Tightening torque:  $45 \pm 5 \text{ N}\cdot\text{m}$ )



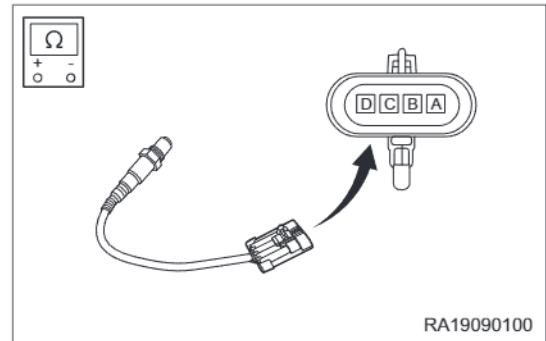
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### Inspection

- Measure the resistance of the downstream oxygen sensor with the digital multimeter.

| Multimeter Connection                                                             | Condition | Specification ( $\Omega$ ) |
|-----------------------------------------------------------------------------------|-----------|----------------------------|
| Pin C - Pin D                                                                     | 20°C      | 7 - 11                     |
| Pin A - Pin B<br>Pin A - Pin C<br>Pin A - Pin D<br>Pin B - Pin C<br>Pin B - Pin D | Always    | $\infty$                   |

If the result is not as specified, replace the downstream oxygen sensor.



### Installation

Installation is in the reverse order of removal.



