

SQRE4G15B EMISSION CONTROL SYSTEM

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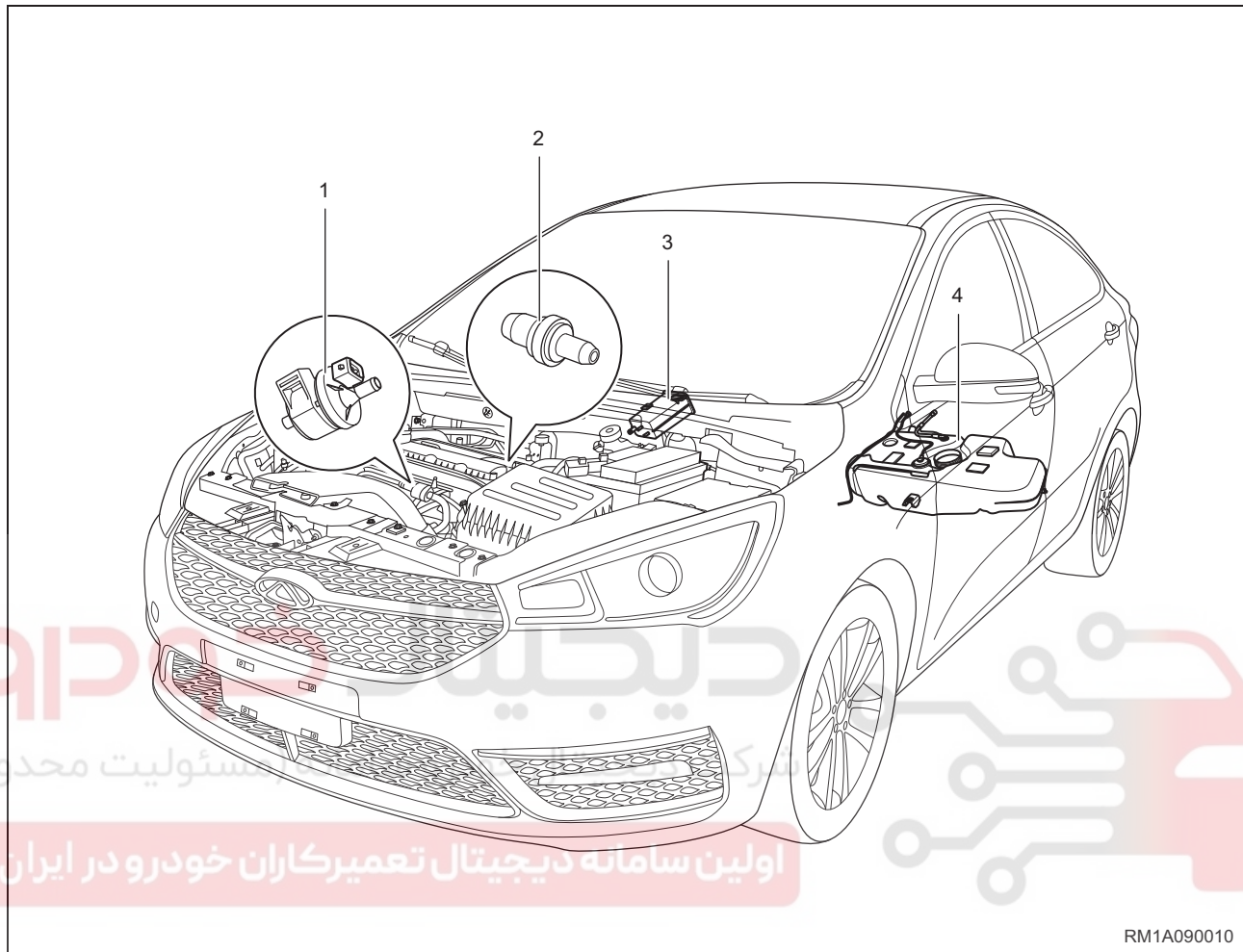
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GENERAL INFORMATION

Description



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

Emission control system recovers and burns fuel vapor to prevent vapor in fuel tank from being discharged into the atmosphere. It monitors oxygen content in exhaust gas, so as to guarantee the maximum efficiency of catalytic converter assembly in converting HC, CO and NOx in exhaust gas. Activated charcoal canister assembly plays an important role in the emission control system and it is used to absorb and filter moisture and fuel vapor. Fresh air enters the bottom of activated charcoal canister assembly while fuel vapor enters the top of activated charcoal canister through fuel vapor hose. When engine stops operating, fuel vapor and fresh air will be stored in the activated charcoal canister assembly. When canister solenoid valve opens in proper time during engine operating, fuel vapor will enter into cylinder from intake manifold to burn.

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

Specifications

Torque Specifications

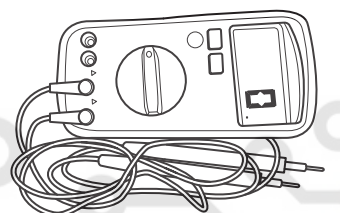
Description	Torque (N·m)
Activated Charcoal Canister Solenoid Valve Bracket Fixing Bolt	7 ± 1
Coupling Bolt Between Activated Charcoal Canister Assembly and Body	5 ± 1
Exhaust Manifold Heat Insulator Fixing Bolt	$8 + 3$
Upstream Oxygen Sensor	45 ± 5
Downstream Oxygen Sensor	45 ± 5

Tool

General Tool

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Digital Multimeter

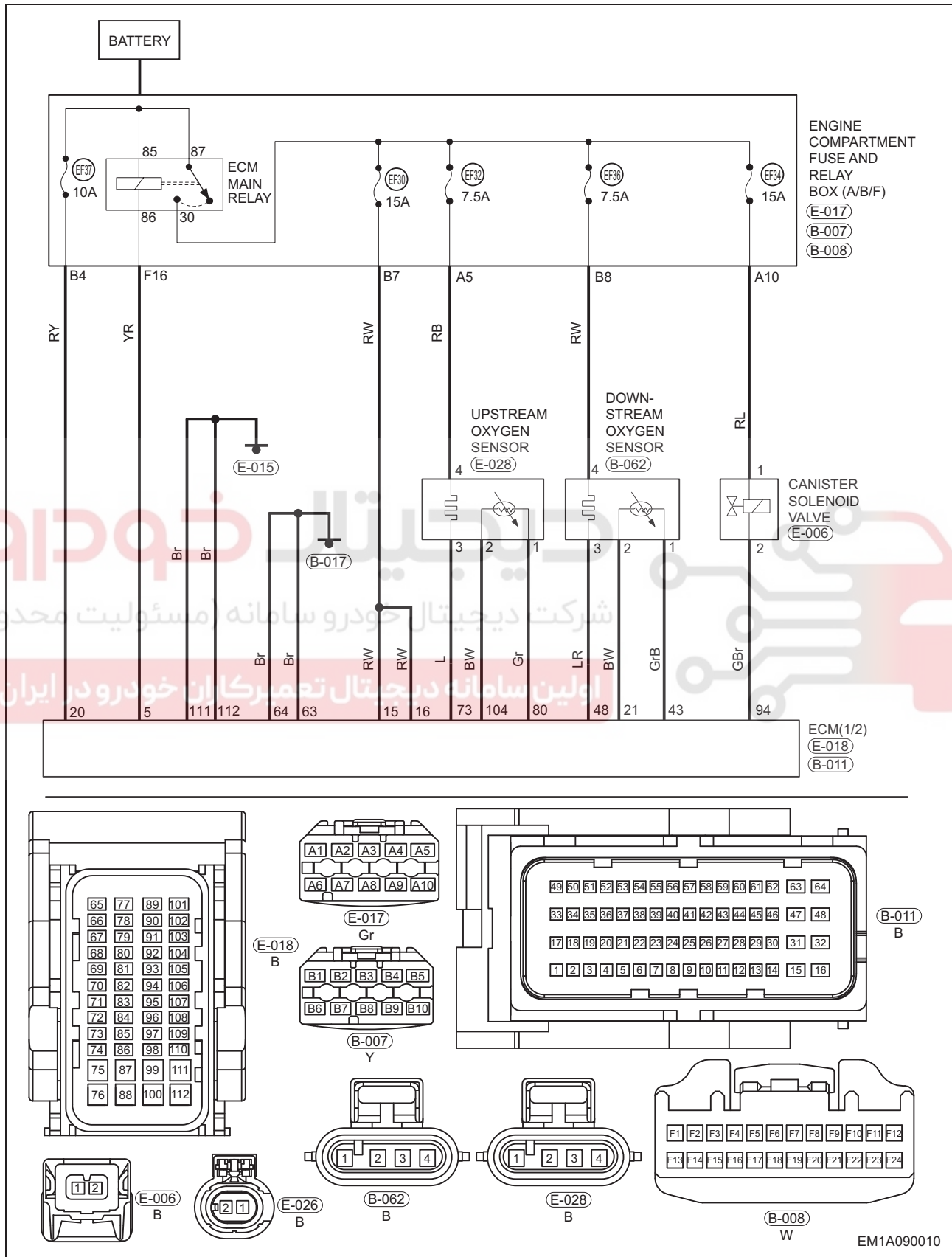


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Circuit Diagram

Emission Control System



DIAGNOSIS & TESTING

Leakage Inspection

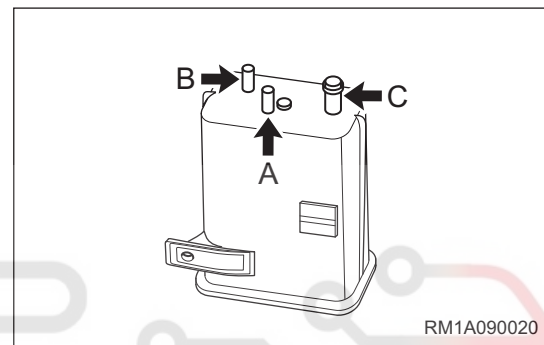
Visually check that hoses, connections and gaskets have no cracks, leaks or damage.

CAUTION

- Removal of 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 disconnection, looseness or cracks in intake system pipes related to throttle assembly will result in engine failure or abnormal operation. Replace parts as necessary.

Activated Charcoal Canister Inspection

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



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Fuel Tank Cap Assembly Inspection

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

ON-VEHICLE SERVICE

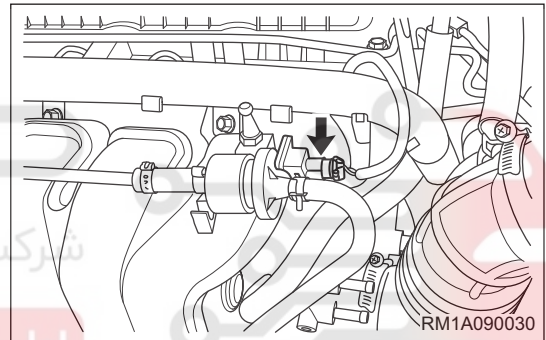
Activated Charcoal Canister Solenoid Valve and Bracket

Removal

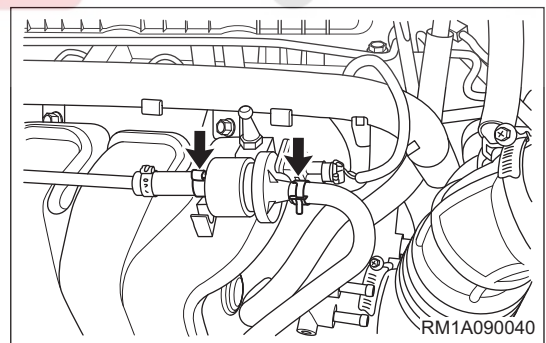
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.
- Before removal, mark the fuel vapor hose III assembly and activated charcoal canister breather pipe to avoid confusion.

1. Turn off all electrical equipment and the 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 activated charcoal canister solenoid valve connector (arrow).



- b. Loosen elastic clamps (arrow) connected with activated charcoal canister solenoid valve.



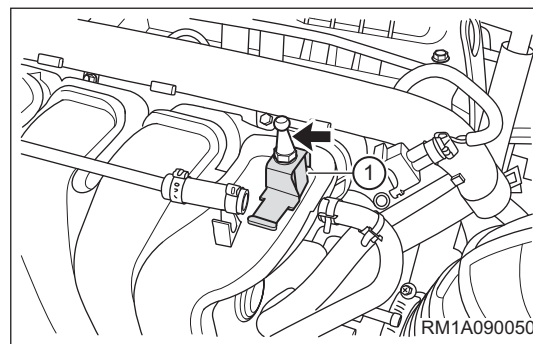
CAUTION

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

- c. Remove charcoal canister solenoid valve from bracket.

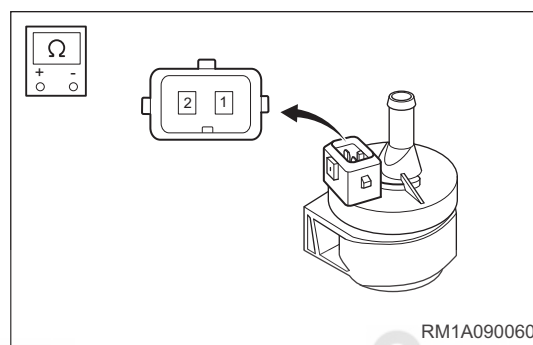
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5. Remove the activated charcoal canister solenoid valve bracket.
 - a. Remove fixing stud bolt (arrow) from activated charcoal canister solenoid valve bracket, and remove activated charcoal canister solenoid valve bracket (1). (Tightening torque: 7 ± 1 N·m)

**Inspection**

Measure resistance between 2 terminals of charcoal canister solenoid valve with a digital multimeter.

Multimeter Connection	Measurement Temperature	Specification (Ω)
Terminal 1 - Terminal 2	20°C	26 ± 4



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Installation

Installation is in the reverse order of removal.

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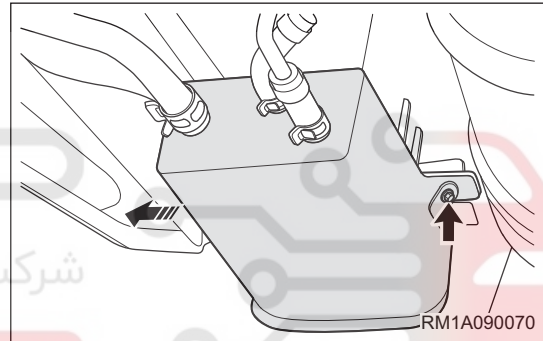
Activated Charcoal Canister Assembly

Removal

CAUTION

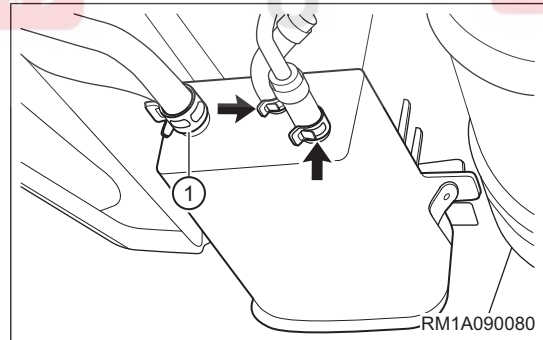
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.
- Before removal, mark the fuel vapor hose II, fuel vapor hose III and charcoal canister breather pipe to avoid confusion.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the rear right wheel house protector (See page 49-27).
4. Remove the activated charcoal canister assembly.
 - a. Remove coupling bolt (arrow) between activated charcoal canister assembly and body. (Tightening torque: 5 ± 1 N·m)
 - b. Remove activated charcoal canister assembly from body bracket in direction of arrow as shown in illustration.

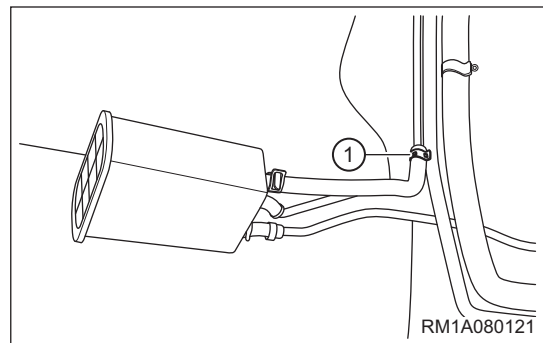


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- c. Loosen 2 elastic clamps (arrow) to disconnect fuel vapor hose and activated charcoal canister assembly, and loosen elastic clamp (1) to remove activated charcoal canister assembly.



- d. Loosen elastic clamp (1), and remove charcoal canister breather pipe from filler tube assembly.



CAUTION

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

ENVIRONMENTAL PROTECTION

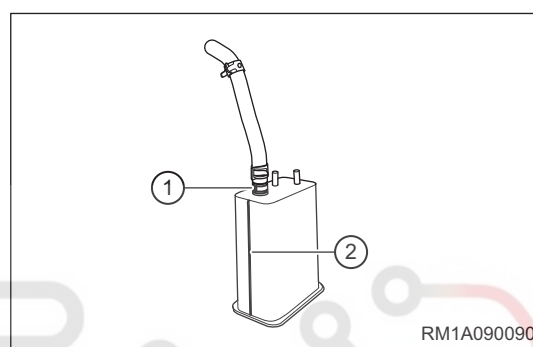
- Unneeded activated charcoal canister assembly should be handled by specialized department according to local laws and regulations. Never discard it at will.

Installation

Installation is in the reverse order of removal.

HINT:

When installing charcoal canister breather pipe, be careful to align white mark (1) on charcoal canister breather pipe with the side seam (2) of activated charcoal canister assembly.



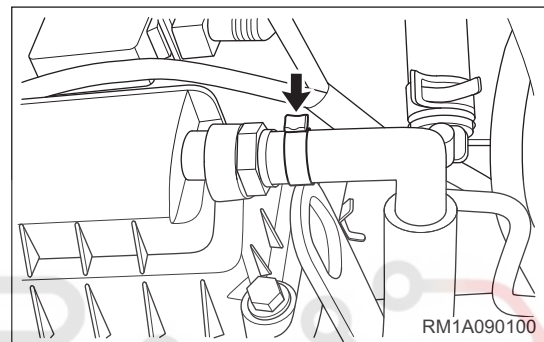
PCV Valve

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the PCV valve.
 - a. Disconnect clamp (arrow) between PCV valve and hose with a tool.



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CAUTION

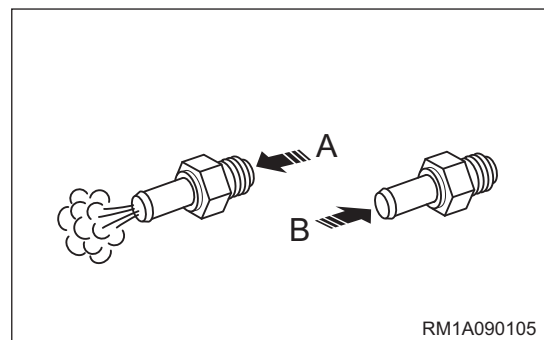
- Positioning distance from hose end to clamp is 3 to 5 mm.

- b. Loosen and remove PCV valve from cylinder head cover.
(Tightening torque: $3 \pm 1 \text{ N}\cdot\text{m}$)

Inspection

1. Install clean hose to PCV valve.
2. Check the PCV valve operation.
 - a. Blow air into intake manifold side, and check that airflow A flows smoothly.
 - b. Blow air into cylinder head side, and check that airflow B flows difficultly.

If result is not as specified, replace PCV valve.



⚠ WARNING

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

3. Remove clean hose from PCV valve.

Installation

Installation is in the reverse order of removal.

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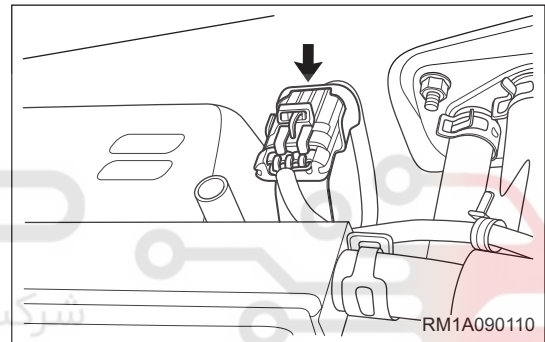
Upstream Oxygen Sensor

Removal

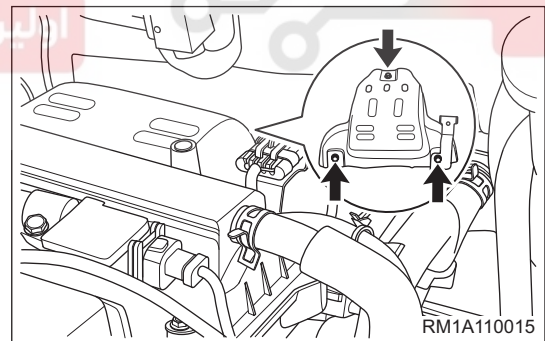
WARNING

- Temperature of exhaust system is very high when engine is running. Before removal, make sure that engine has stopped running and exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

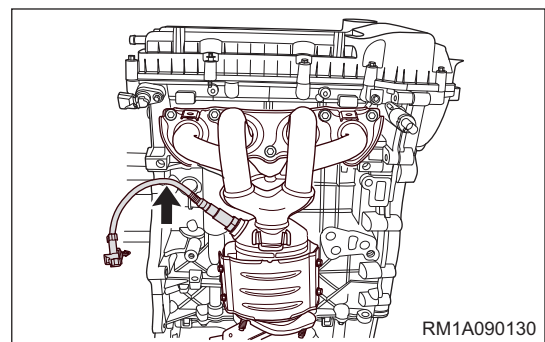
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the upstream oxygen sensor.
 - a. Remove and disconnect upstream oxygen sensor connector (arrow) from bracket.



- b. Remove 3 fixing bolts (arrow) from exhaust manifold heat insulator, and remove exhaust manifold heat insulator. (Tightening torque: $8 + 3 \text{ N}\cdot\text{m}$)



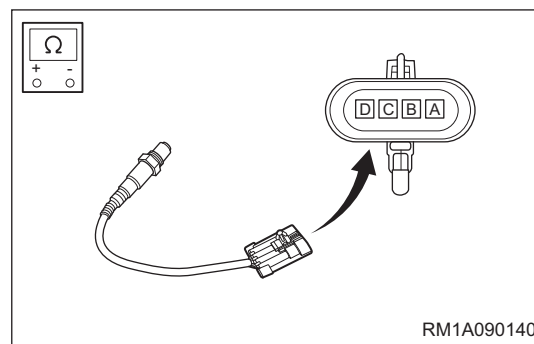
- c. Remove upstream oxygen sensor (arrow) from exhaust manifold. (Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)



Inspection

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

Multimeter Connection	Condition	Specified Condition
Terminal C - Terminal D	20°C	5 - 25 Ω
Terminal A - Terminal B Terminal A - Terminal C Terminal A - Terminal D Terminal B - Terminal C Terminal B - Terminal D	Always	No continuity



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

Installation

Installation is in the reverse order of removal.

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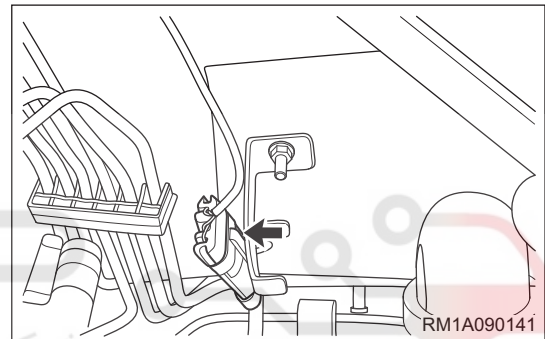
Downstream Oxygen Sensor

Removal

WARNING

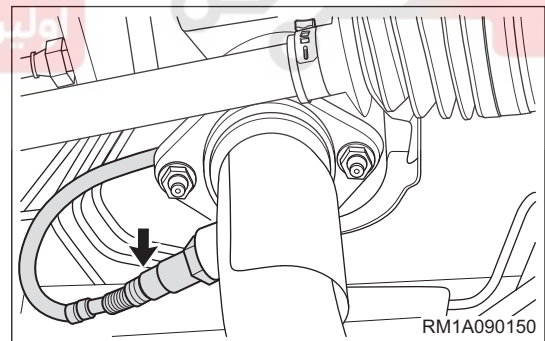
- Temperature of exhaust system is very high when engine is running. Before removal, make sure that engine has stopped running and exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the downstream oxygen sensor.
 - a. Remove and disconnect downstream oxygen sensor connector (arrow) from bracket.



- b. Raise vehicle to a proper position.

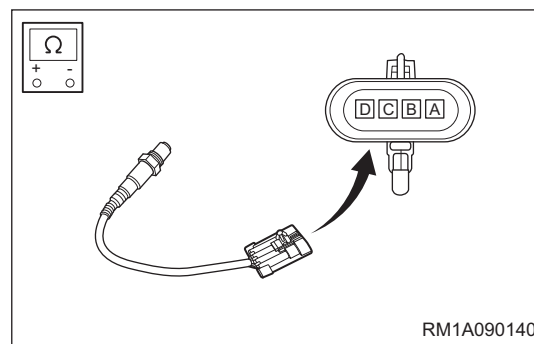
- c. Remove downstream oxygen sensor (arrow) from front exhaust pipe assembly.
(Tightening torque: 45 ± 5 N·m)



Inspection

1. Measure resistance of downstream oxygen sensor with a digital multimeter.

Multimeter Connection	Condition	Specified Condition
Terminal C - Terminal D	20°C	5 - 25 Ω
Terminal A - Terminal B Terminal A - Terminal C Terminal A - Terminal D Terminal B - Terminal C Terminal B - Terminal D	Always	No continuity



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

Installation

Installation is in the reverse order of removal.

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