

SQRE4G15B EXHAUST SYSTEM

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اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



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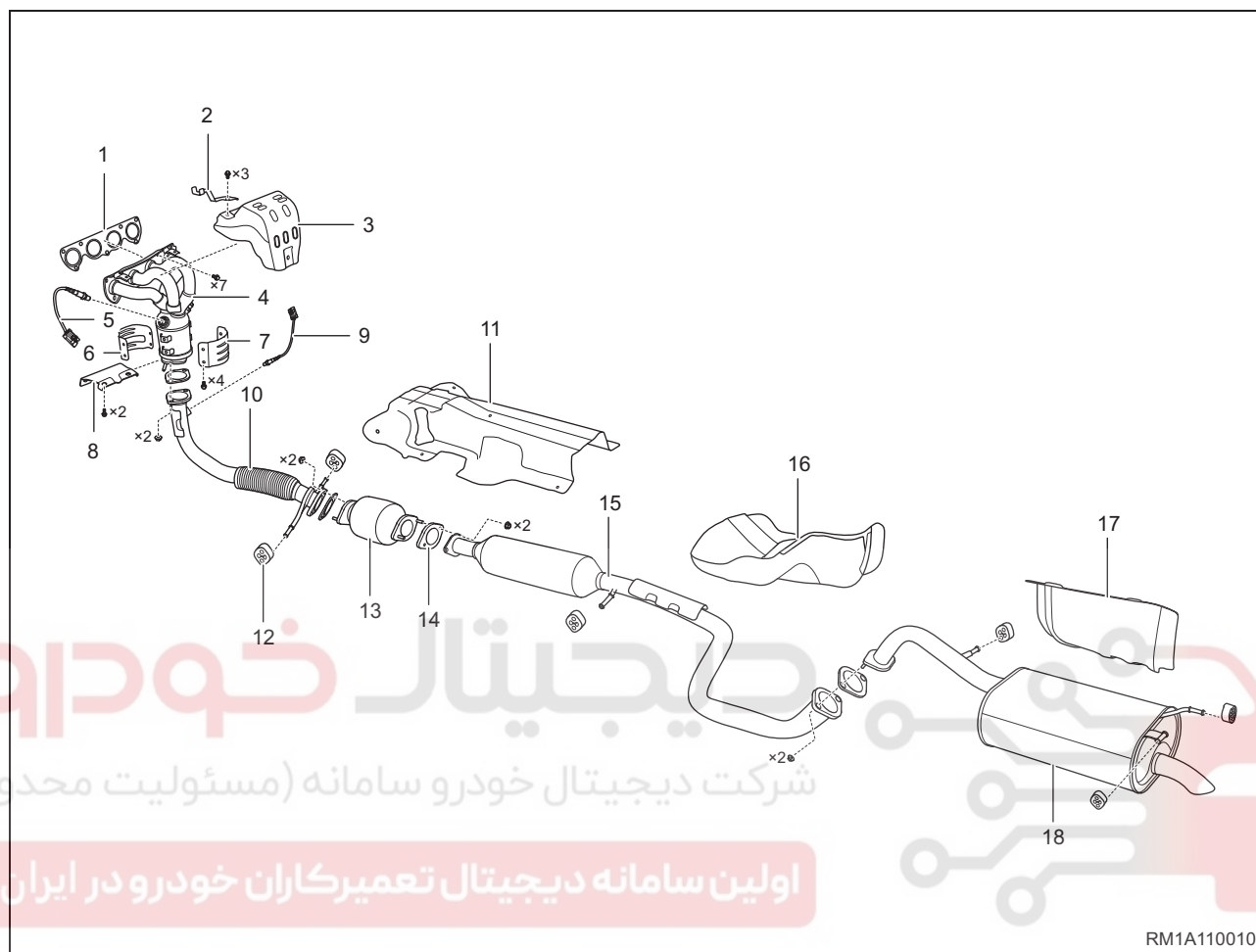
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GENERAL INFORMATION

Description



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1 - Exhaust Manifold Gasket	2 - Oxygen Sensor Bracket
3 - Exhaust Manifold Heat Insulator	4 - Exhaust Manifold Assembly
5 - Upstream Oxygen Sensor	6 - Front Precatalytic Converter Heat Insulator
7 - Rear Precatalytic Converter Heat Insulator	8 - Exhaust Manifold Bracket
9 - Downstream Oxygen Sensor	10 - Front Exhaust Pipe Assembly
11 - Muffler Heat Insulator 2	12 - Diamond Shaped Hanger Block
13 - Main Catalytic Converter Assembly	14 - Gasket
15 - Front Muffler Assembly	16 - Fuel Tank Heat Insulator
17 - Muffler Heat Insulator 1	18 - Rear Muffler Assembly

Exhaust system is used to control engine exhaust, reducing vehicle emissions by precatalytic converter and main catalytic converter, and eliminating exhaust noise by muffler. When exhaust system discharges exhaust gas, oxygen sensor monitors oxygen content in exhaust gas. Engine control module adjusts air-fuel ratio of combustible gas mixture to control vehicle emissions and achieve optimal fuel economy according to feedback signals of oxygen sensor and combining with other sensor signals.

Specifications

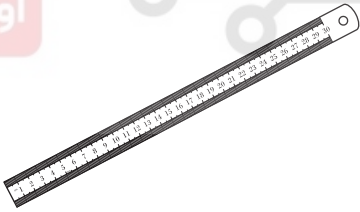
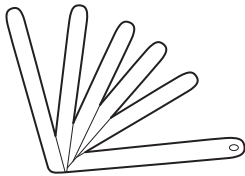
Torque Specifications

Description	Torque (N·m)
Exhaust Manifold Heat Insulator Fixing Bolt	8 + 3
Coupling Nut Between Exhaust Manifold Assembly and Front Exhaust Pipe Assembly	45 ± 5
Coupling Bolt Between Exhaust Manifold Assembly and Exhaust Manifold Bracket	20 + 5
Exhaust Manifold Assembly Fixing Nut	20 + 5
Precatalytic Converter Heat Insulator Fixing Bolt	8 + 3
Coupling Nut Between Main Catalytic Converter Assembly and Front Exhaust Pipe Assembly	45 ± 5
Coupling Nut Between Main Catalytic Converter Assembly and Front Muffler Assembly	45 ± 5
Coupling Nut Between Front Muffler Assembly and Rear Muffler Assembly	45 ± 5
Upstream Oxygen Sensor	45 ± 5
Downstream Oxygen Sensor	45 ± 5

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Tools

General Tools

Precision Straightedge	 RCH0000063
Feeler Gauge	 RCH0000060

DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

Symptom	Suspected Area	See page
Excessive exhaust noise	Exhaust pipe (loose connection)	11-4
	Exhaust manifold assembly (damaged or leaked)	11-6
	Main catalytic converter assembly (damaged or leaked)	11-12
	Front muffler assembly (damaged or leaked)	11-14
	Rear muffler assembly (damaged or leaked)	11-16
	Exhaust pipe gasket (damaged)	-
Excessive exhaust temperature	Exhaust manifold assembly (blocked)	11-6
	Main catalytic converter assembly (blocked)	11-12
	Precatalytic converter assembly (blocked)	-
	Incorrect ignition timing in ignition system	-
	Inadequate gas mixture combustion	-
Exhaust pipe leakage	Exhaust pipe gasket (damaged)	-
	Exhaust manifold assembly (damaged or leaked)	11-6
	Main catalytic converter assembly (damaged or leaked)	11-12
	Front muffler assembly (damaged or leaked)	11-14
	Rear muffler assembly (damaged or leaked)	11-16

Exhaust System Gas Leakage Inspection

Method to check gas leakage in exhaust system joints:

Warm up engine for a while, and check for gas leakage in exhaust system joints. A certain amount of gas leakage at exhaust pipe joint is allowed, but gas leakage at joint between exhaust manifold and cylinder head is prohibited. Judging standard is that engine does not shudder and no "poof" sound is heard from joints.

ON-VEHICLE SERVICE

Exhaust Manifold Assembly

Removal

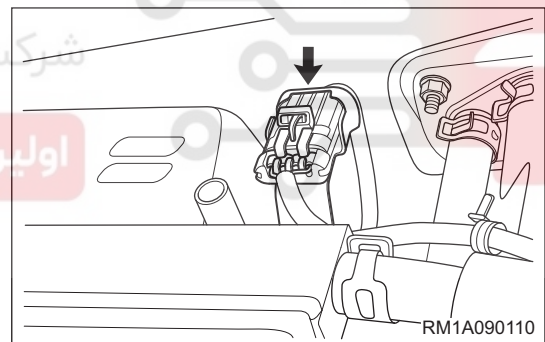
WARNING

- 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.

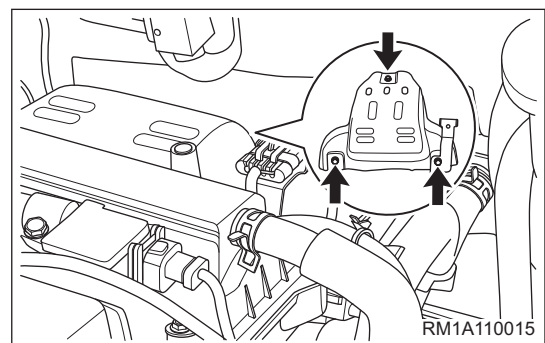
CAUTION

- 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 exhaust manifold heat insulator.
 - a. Disconnect upstream oxygen sensor connector (arrow) from bracket.

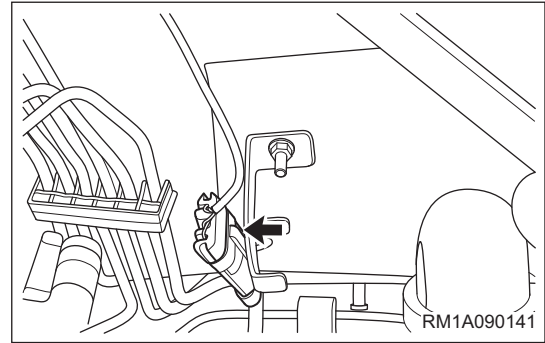


- b. Remove 3 fixing bolts (arrow) from exhaust manifold heat insulator, and remove oxygen sensor bracket. (Tightening torque: 8 + 3 N·m)

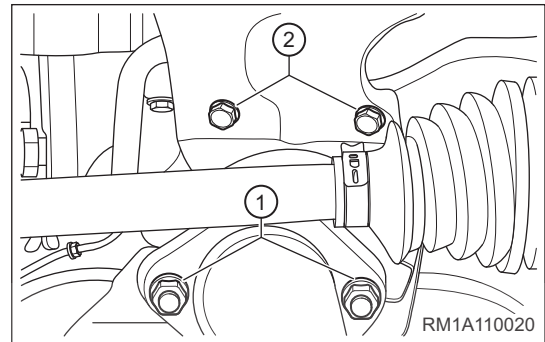


- c. Remove the exhaust manifold heat insulator.

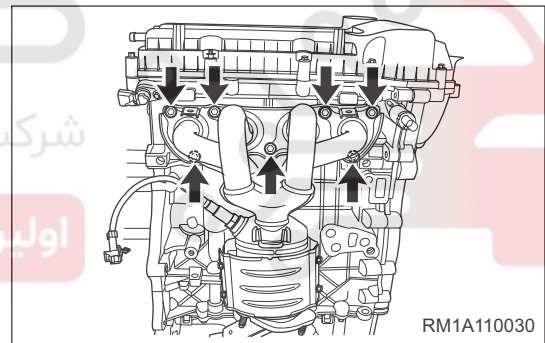
5. Remove the exhaust manifold assembly.
- Disconnect downstream oxygen sensor connector (arrow) from bracket.



- Remove 2 coupling nuts (1), then disconnect connection between exhaust manifold assembly and front exhaust pipe assembly, and remove gasket from connecting part.
(Tightening torque: 45 ± 5 N·m)
- Remove 2 coupling bolts (2) between exhaust manifold assembly and exhaust manifold bracket.
(Tightening torque: $20 + 5$ N·m)



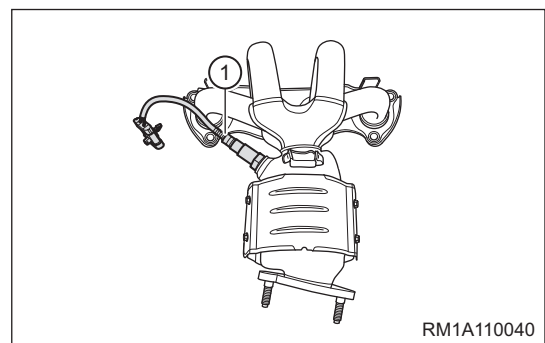
- Remove 7 fixing nuts (arrow) from exhaust manifold assembly.
(Tightening torque: $20 + 5$ N·m)



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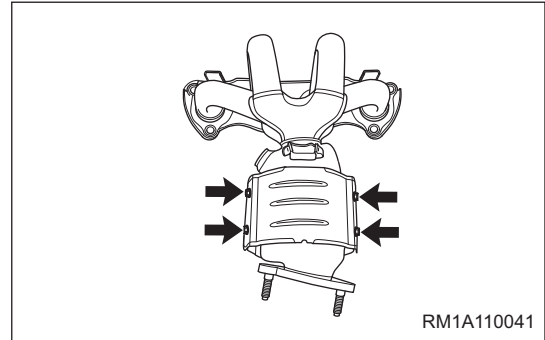
- Remove engine right mounting cushion, remove exhaust manifold assembly after lowering engine, and remove exhaust manifold assembly gasket.

6. Remove upstream oxygen sensor (1) from exhaust manifold assembly.
(Tightening torque: 45 ± 5 N·m)



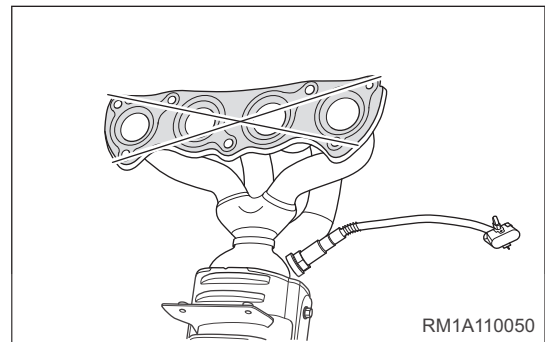
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7. Remove 4 precatalytic converter heat insulator fixing bolts (arrow) from exhaust manifold assembly, and remove exhaust manifold assembly.
(Tightening torque: $8 + 3 \text{ N}\cdot\text{m}$)



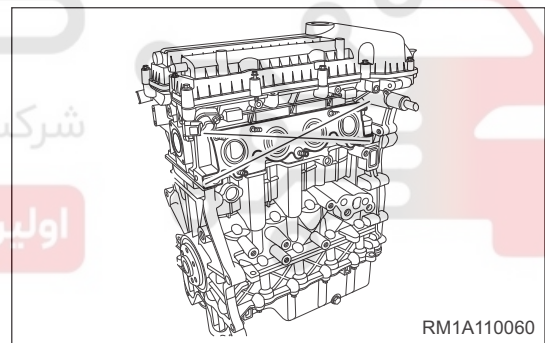
Inspection

1. Measure warpage on surface of exhaust manifold assembly with a precision straightedge and a feeler gauge. If warpage on the surface is greater than 0.5 mm, replace it.

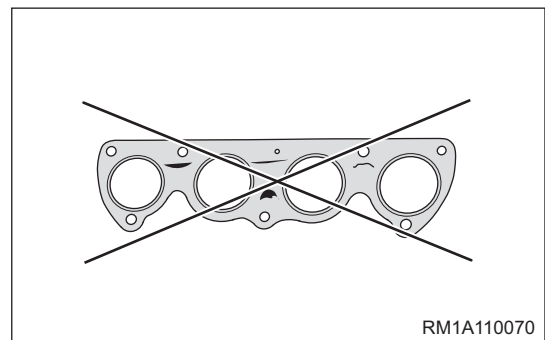


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2. Measure warpage on exhaust surface of cylinder head with a precision straightedge and a feeler gauge. If warpage on the surface is greater than 0.04 mm, replace it.



3. Check the exhaust manifold gasket. There should be no scratches or roughness. Otherwise, replace it.



Installation

Installation is in the reverse order of removal.

CAUTION

- If gasket is damaged, replace it, and remove foreign matters on joints and threads.
- If there is any crack or leakage in exhaust manifold assembly, replace it.
- Check that there is no exhaust gas leakage in connecting part of upstream oxygen sensor.
- When installation is completed, check that there is no exhaust gas leakage between exhaust manifold assembly and cylinder head or main catalytic converter assembly.

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Front Exhaust Pipe Assembly

Removal

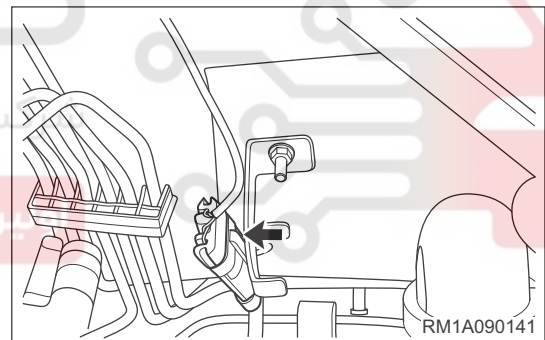
WARNING

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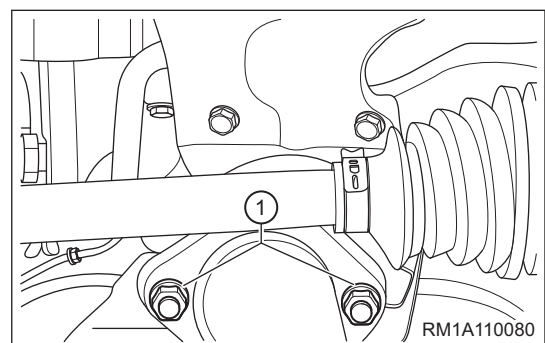
CAUTION

- When removing front exhaust pipe assembly, an assistant is needed to hold it. During operation, prevent front muffler assembly from dropping, which may cause an accident.
- 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.
 - a. Disconnect downstream oxygen sensor connector (arrow) from bracket.



- b. Remove 2 coupling nuts (1), then disconnect connection between exhaust manifold assembly and main catalytic converter assembly, and remove gasket from connecting part.
(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)

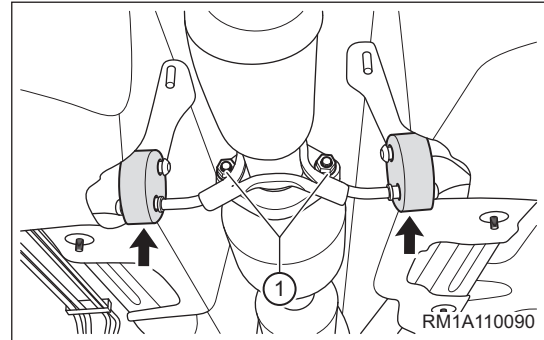


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- c. Remove 2 coupling nuts (1), then disconnect connection between front muffler assembly and main catalytic converter assembly, and remove gasket from connecting part.

(Tightening torque: 45 ± 5 N·m)

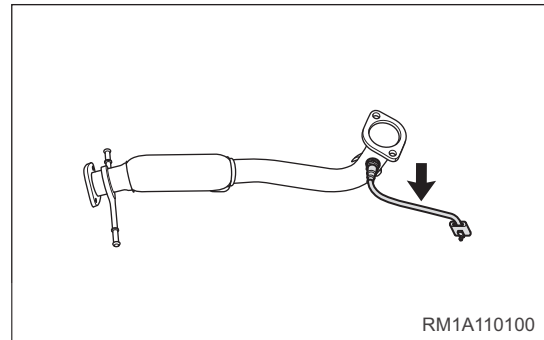
- d. Separate 2 diamond shaped hanger blocks (arrow) between front exhaust pipe assembly and body hook.



- e. Remove the front exhaust pipe assembly.

4. Remove downstream oxygen sensor (arrow) from front exhaust pipe assembly.

(Tightening torque: 40 - 60 N·m)



Installation

Installation is in the reverse order of removal.

CAUTION

- If gasket is damaged, replace it, and remove foreign matters on joints and threads.
- Check for exhaust gas leaks. If gas leaks, tighten the malfunctioning part to prevent leakage. Replace damaged parts as necessary.
- Check that there is no exhaust gas leakage in connecting part of downstream oxygen sensor.

Main Catalytic Converter Assembly

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.

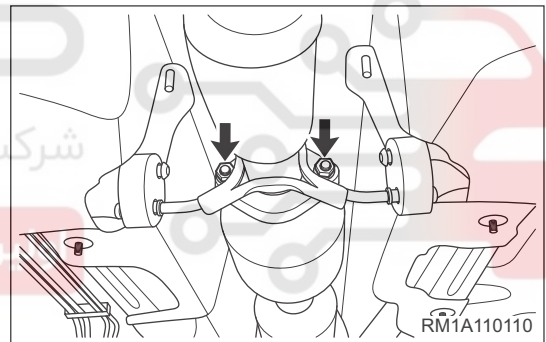
CAUTION

- 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.

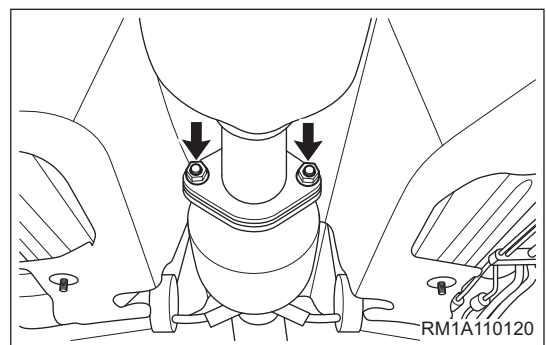
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Raise the vehicle to a proper height.
4. Remove the main catalytic converter assembly.

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- a. Remove 2 coupling nuts (arrow), then disconnect connection between front exhaust pipe assembly and main catalytic converter assembly, and remove gasket from connecting part.
(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)



- b. Remove 2 coupling nuts (arrow), then disconnect connection between main catalytic converter assembly and front muffler assembly, and remove gasket from connecting part.
(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)



- c. Remove the main catalytic converter assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- If gasket is damaged, replace it, and remove foreign matters on joints and threads.
- If there is any crack or leakage in main catalytic converter assembly, replace it.
- Check for exhaust gas leaks. If gas leaks, tighten the malfunctioning part to prevent leakage. Replace damaged parts as necessary.

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Front Muffler Assembly

Removal

WARNING

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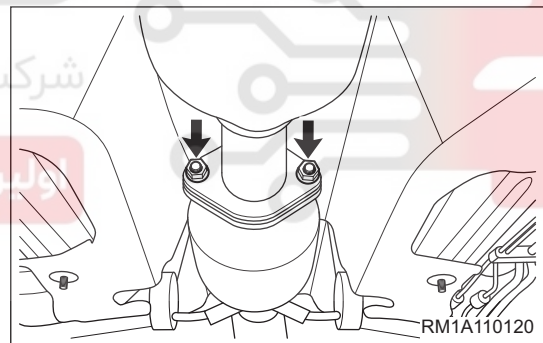
CAUTION

- When removing front muffler assembly, an assistant is needed to hold it. During operation, prevent front muffler assembly from dropping, which may cause an accident.
- 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. Raise the vehicle to a proper position.
4. Remove the front muffler assembly.

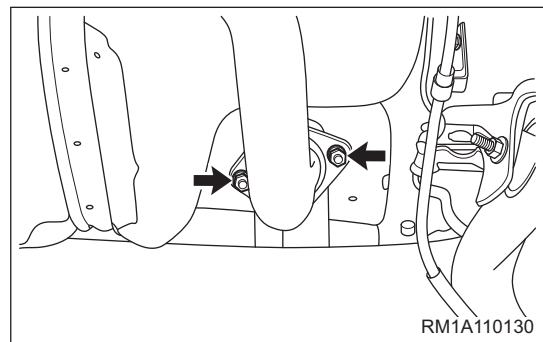
- a. Remove 2 coupling nuts (arrow), then disconnect connection between front muffler assembly and main catalytic converter assembly, and remove gasket from connecting part.

(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)

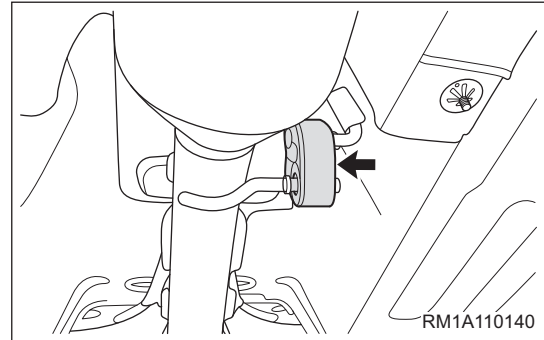


- b. Remove 2 coupling nuts (arrow), then disconnect connection between front muffler assembly and rear muffler assembly, and remove gasket from connecting part.

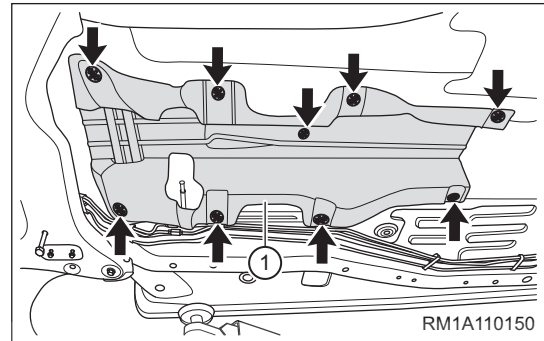
(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)



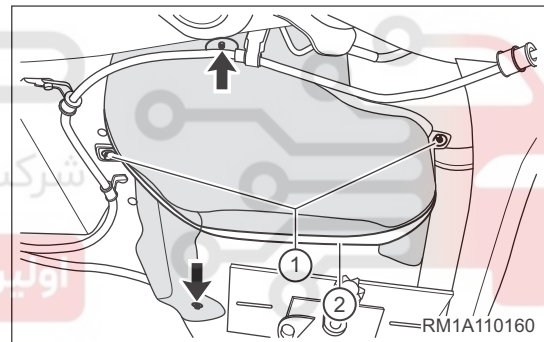
- c. Separate diamond shaped hanger block (arrow) between front muffler assembly and body hook.



5. Remove the muffler heat insulator 2.
a. Remove 9 clamping pieces (arrow) and remove muffler heat insulator 2 (1).



6. Remove the fuel tank heat insulator assembly.
a. Remove 2 fixing bolts (1) and remove fuel tank fixing strap II (2) when supporting fuel tank with a hydraulic jack.
b. Remove 2 plastic mounting nuts (arrow) from fuel tank heat insulator assembly.



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- c. Remove the fuel tank heat insulator assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- If gasket is damaged, replace it, and remove foreign matters on joints and threads.
- If there is any crack or leakage in rear muffler assembly, replace it.
- Check for exhaust gas leaks. If gas leaks, tighten the malfunctioning part to prevent leakage. Replace damaged parts as necessary.

Rear Muffler Assembly

Removal

WARNING

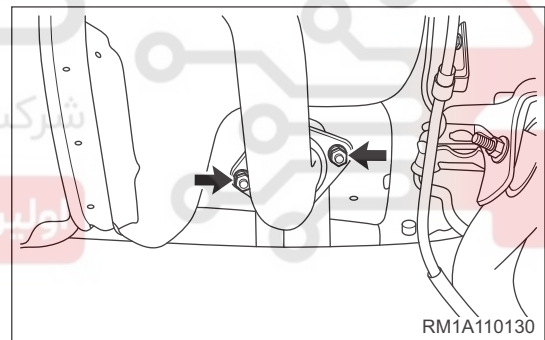
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CAUTION

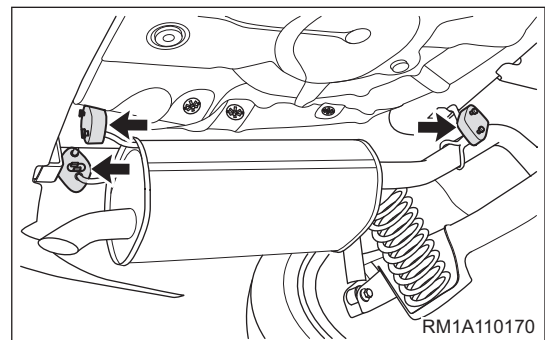
- When removing rear muffler assembly, an assistant is needed to hold it. During operation, prevent rear muffler assembly from dropping, which may cause an accident.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Raise the vehicle to a proper position.
3. Remove the rear muffler assembly.

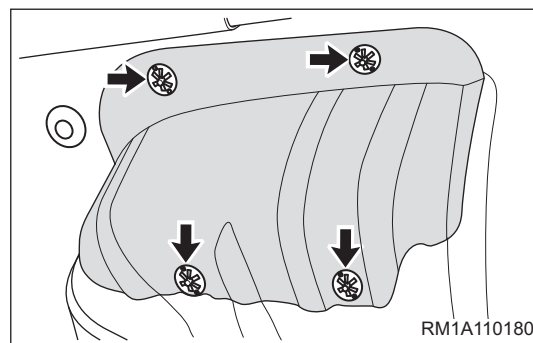
- a. Remove 2 coupling nuts (arrow), then disconnect connection between rear muffler assembly and front muffler assembly, and remove gasket from connecting part.
(Tightening torque: 45 ± 5 N·m)



- b. Separate 3 diamond shaped hanger blocks (arrow) between rear muffler assembly and body hooks.



4. Remove the rear muffler heat insulator assembly.
 - a. Remove 4 clamping pieces (arrow) from rear muffler heat insulator assembly.



- b. Remove the rear muffler heat insulator assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- If gasket is damaged, replace it, and remove foreign matters on joints and threads.
- If there is any crack or leakage in rear muffler assembly, replace it.
- Check for exhaust gas leaks. If gas leaks, tighten the malfunctioning part to prevent leakage. Replace damaged parts as necessary.

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