

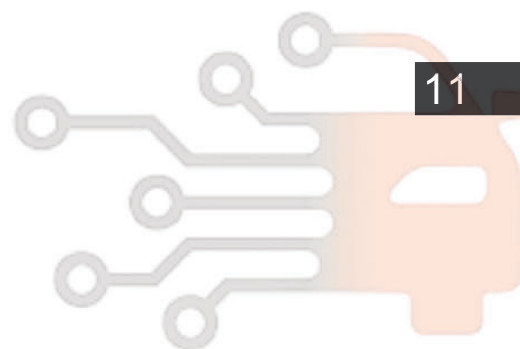
SQRD4G15B EXHAUST SYSTEM

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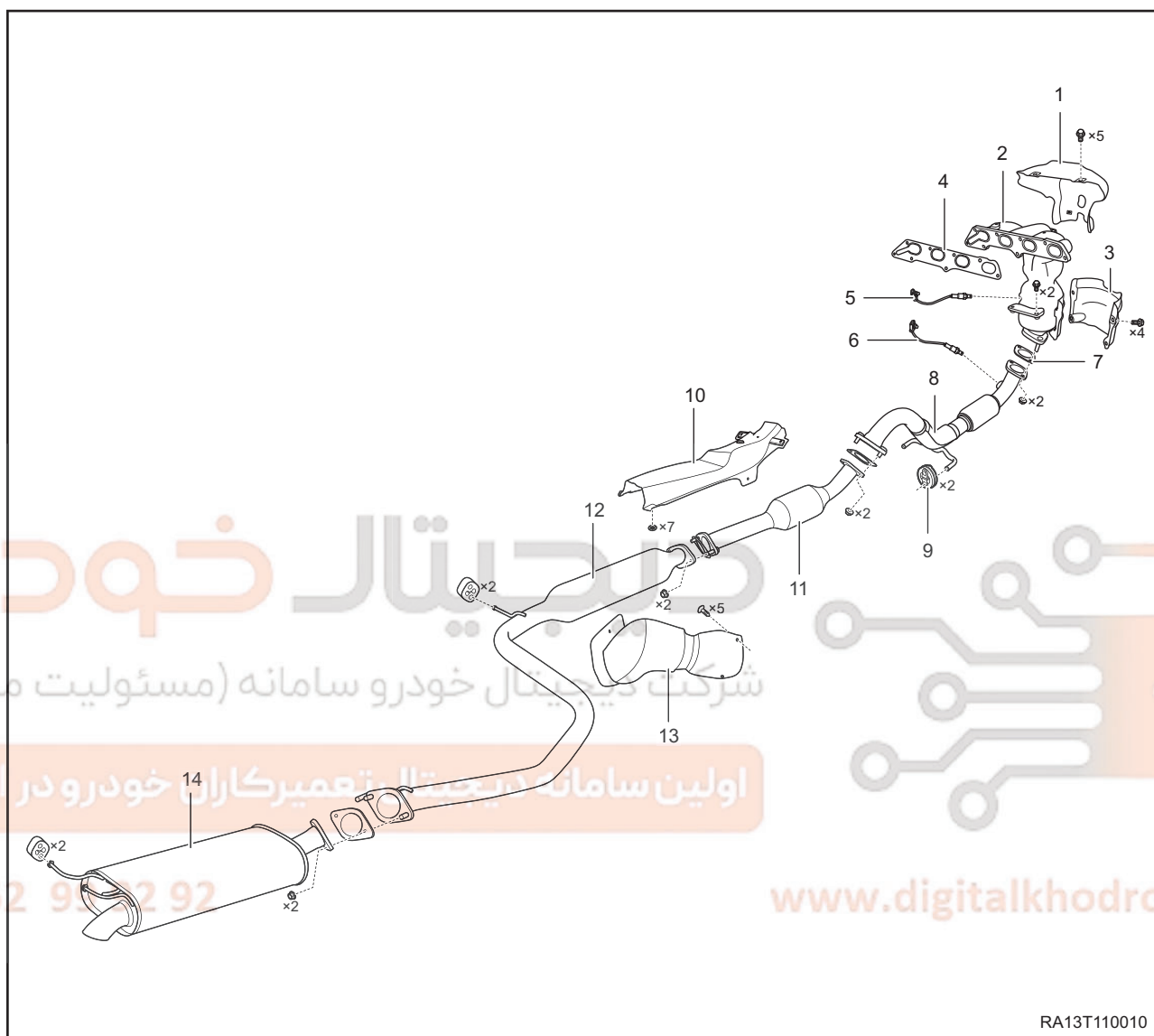


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GENERAL INFORMATION

Description



11 - SQRD4G15B EXHAUST SYSTEM

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

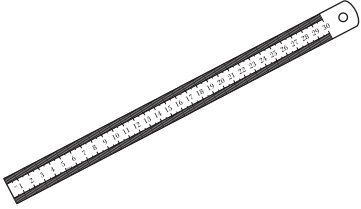
Specifications

Torque Specifications

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

Tools

General Tools

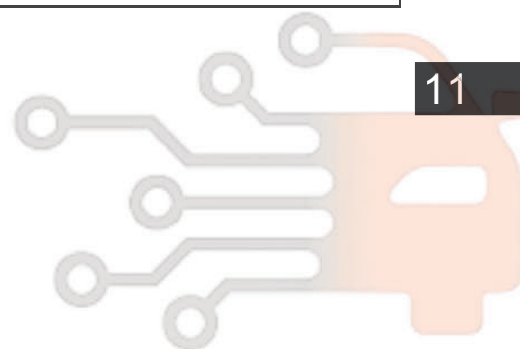
Precision Straightedge	 RCH0000063
Feeler Gauge	 RCH0000060

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DIAGNOSIS & TESTING

Problem Symptoms Table

Symptom	Suspected Area	See page
Excessive exhaust noise	Exhaust pipe (loose connection)	-
	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 manifold assembly (damaged or leaked)	11-7
Excessive exhaust temperature	Precatalytic converter assembly (blocked)	11-7
	Main catalytic converter assembly (blocked)	11-12
	Incorrect ignition timing in ignition system	07-23
	Inadequate gas mixture combustion	-
Exhaust pipe leakage	Exhaust pipe gasket (damaged)	-
	Exhaust pipe (damaged)	-

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Exhaust System Gas Leakage Inspection

Inspection method for gas leakage in exhaust system joints:

Warm up engine for a while, and check exhaust system joints for gas leakage. 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 there is no shuddering in engine and no "poof" sound is heard from joints.

ON-VEHICLE SERVICE

Exhaust Manifold Assembly

Removal

WARNING

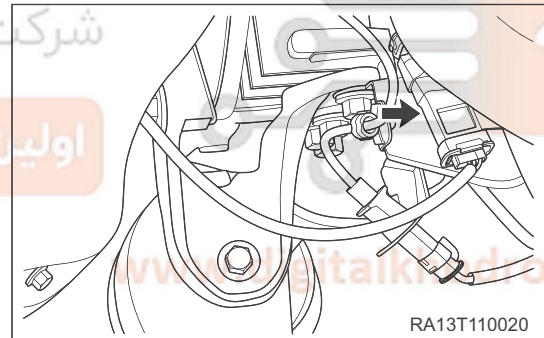
- Temperature of exhaust system is very high when engine is running. Before removal, make sure that engine has stopped running and exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.

1. Turn off all electrical equipment and the ignition switch.

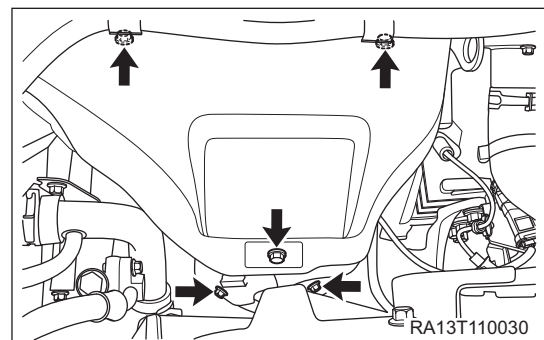
CAUTION

- Install protector to prevent body from being scratched.

2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the air filter assembly (See page 10-10).
5. Take off and disconnect upstream oxygen sensor connector (arrow) from bracket.



6. Remove the exhaust manifold heat insulator.
 - a. Remove 5 fixing bolts (arrow) from exhaust manifold heat insulator.
(Tightening torque: 8 + 3 N·m)



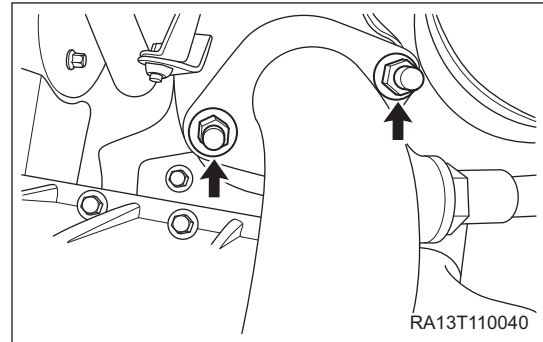
- b. Remove the exhaust manifold heat insulator.

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7. Remove the exhaust manifold assembly.

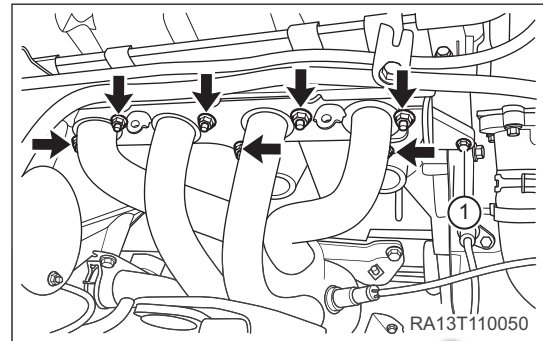
- a. Remove 2 coupling nuts (arrow), disconnect exhaust manifold assembly and front pipe assembly, and remove gasket from connecting part.

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



- b. Remove 7 fixing nuts (arrow) and fixing bolt (arrow) from exhaust manifold assembly.

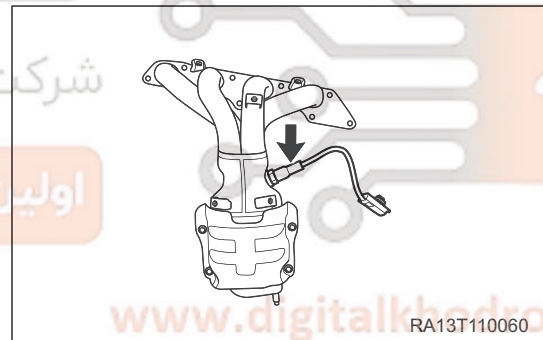
(Tightening torque: $20 + 5 \text{ N}\cdot\text{m}$)



- c. Remove engine lifting eye and exhaust manifold assembly, and take off exhaust manifold assembly and gasket.

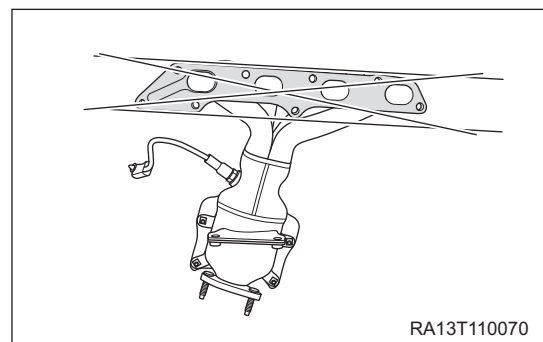
8. Remove upstream oxygen sensor (arrow) from exhaust manifold assembly.

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



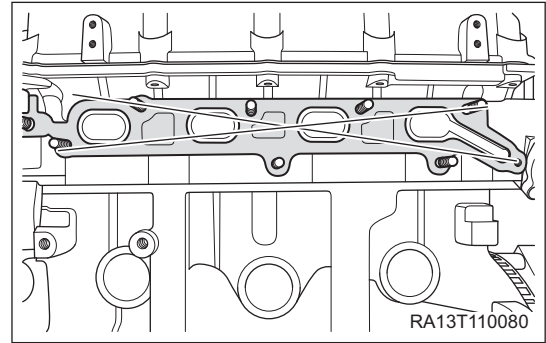
Inspection

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

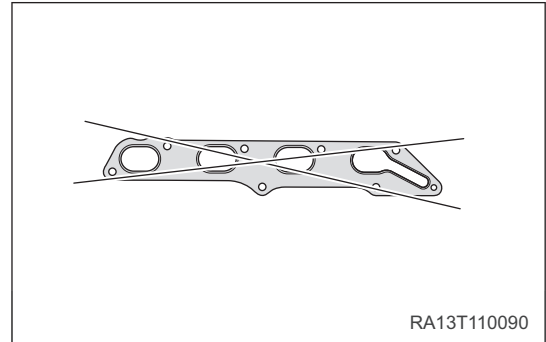


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2. Measure warpage on exhaust surface of cylinder head with a precision straightedge and a feeler gauge. If warpage on surface is greater than 0.4 mm, replace it.



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

- After installation is completed, check that there is no exhaust gas leakage between exhaust manifold assembly and cylinder head or front pipe assembly.
- Check that there is no exhaust gas leakage in connecting part of upstream oxygen sensor.

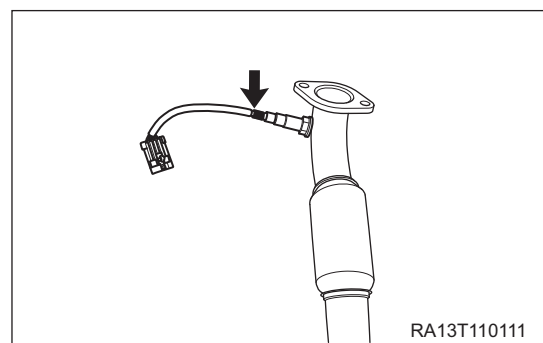
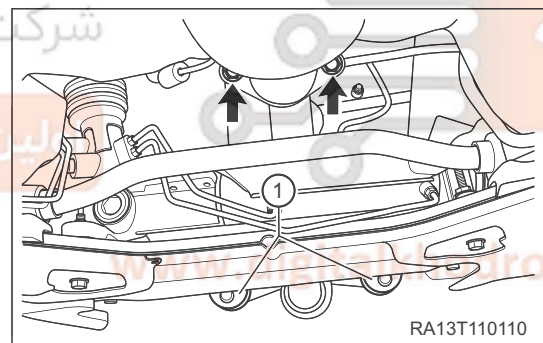
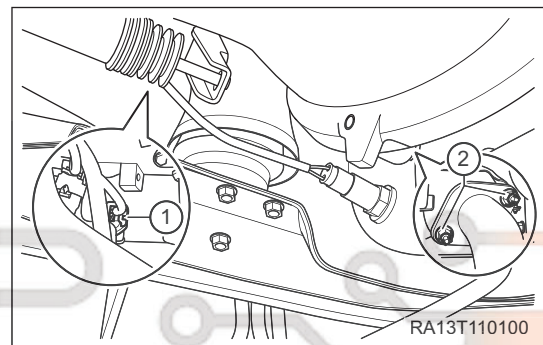
Front Pipe Assembly

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.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front pipe assembly.
 - a. Take off and disconnect downstream oxygen sensor connector (1) from bracket.
 - b. Remove 2 coupling nuts (2), disconnect exhaust manifold assembly and front pipe assembly, and remove gasket from connecting part.
(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)
 - c. Remove 2 diamond shaped hanger blocks (1) between front pipe and sub frame.
 - d. Remove 2 coupling nuts (arrow), disconnect front pipe assembly and main catalytic converter assembly, and remove gasket from connecting part.
(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)
 - e. Remove the front pipe assembly.
4. Remove downstream oxygen sensor (arrow) from front pipe assembly.
(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)



Installation

Installation is in the reverse order of removal.

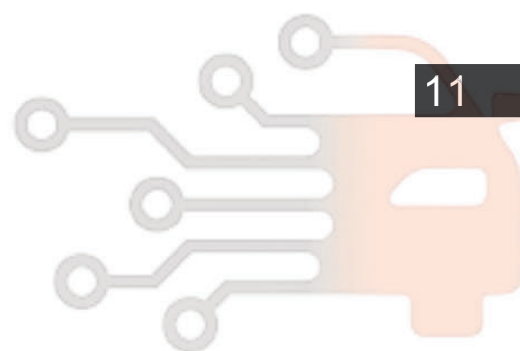
CAUTION

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

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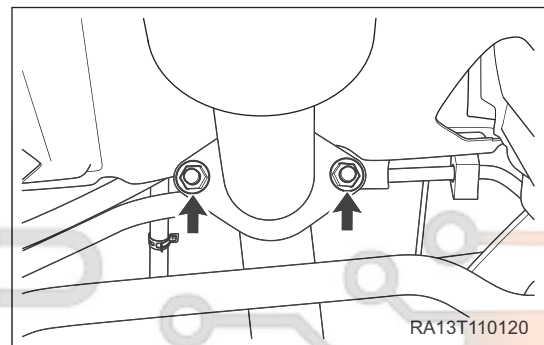
Main Catalytic Converter Assembly

Removal

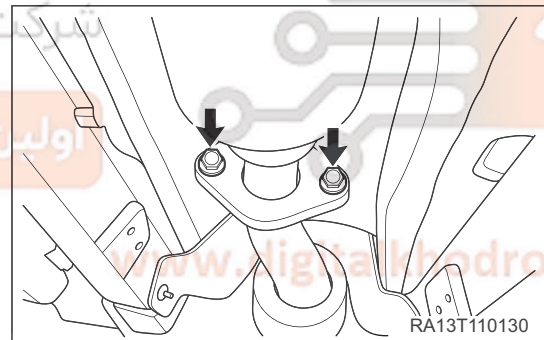
WARNING

- 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.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the main catalytic converter assembly.
 - a. Remove 2 coupling nuts (arrow), disconnect main catalytic converter assembly and front pipe assembly, and remove gasket from connecting part.
(Tightening torque: $45 \pm 5 \text{ N}\cdot\text{m}$)



- b. Remove 2 coupling nuts (arrow), disconnect 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.

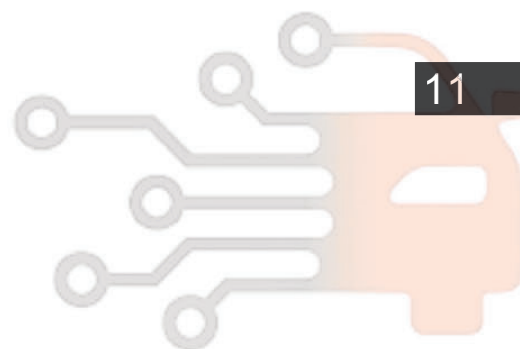
CAUTION

- 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.
- Keep sufficient space between main catalytic converter assembly and vehicle body during installation.
- Lubricate joints with lubricant firstly, which can be helpful in separating front exhaust pipe assembly and diamond shaped hanger block.
- Check for exhaust gas leakage. If gas leaks, tighten the malfunctioning part to prevent leakage. Replace damaged parts as necessary.

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Front Muffler Assembly

Removal

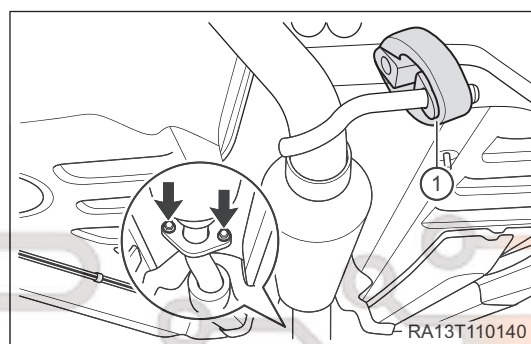
⚠ WARNING

- 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.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front muffler assembly.

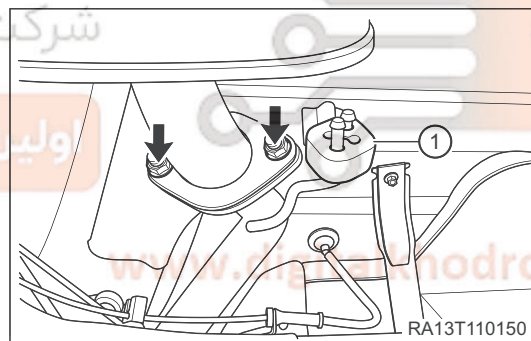
- a. Remove 2 coupling nuts (arrow), disconnect front muffler assembly and main catalytic converter assembly, and remove gasket from connecting part.
(Tightening torque: 45 ± 5 N·m)

- b. Detach diamond shaped hanger block (1) between front muffler assembly and body hook.



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

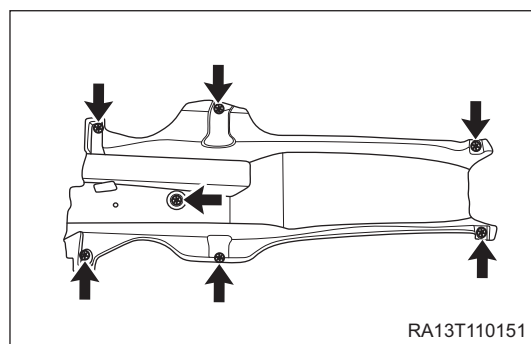
- d. Detach diamond shaped hanger block (1) between front muffler assembly and body hook.



- e. Remove the front muffler assembly.

4. Remove the muffler heat insulator I .

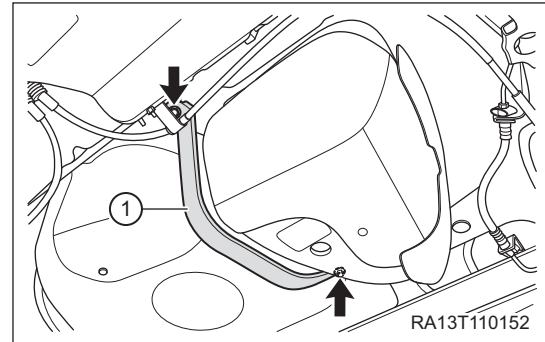
- a. Remove the main catalytic converter assembly (See page 11-12).
- b. Remove 7 clamping pieces (arrow) from muffler heat insulator I .



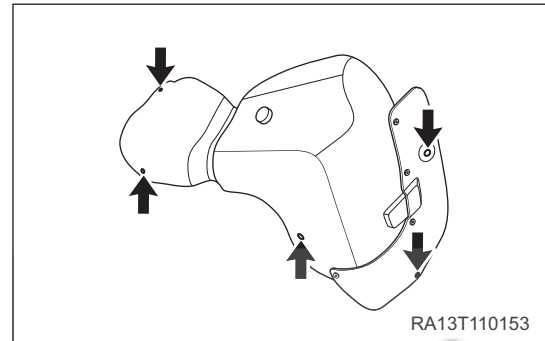
- c. Remove the muffler heat insulator I .

5. Remove the fuel tank heat insulator.

- a. Support fuel tank with a transmission carrier, and remove fuel tank fixing straps (arrow).



- b. Remove 5 screws (arrow) from fuel tank heat insulator.



- c. Remove the fuel tank heat insulator.

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, replace it.
- During installation, check that exhaust system components do not contact with muffler heat insulator I or vehicle underbody. Make sure that clearance between exhaust system components and muffler heat insulator or vehicle underbody is more than 25 mm.
- Check for exhaust gas leakage. If gas leaks, tighten the malfunctioning part to prevent leakage. Replace damaged parts as necessary.

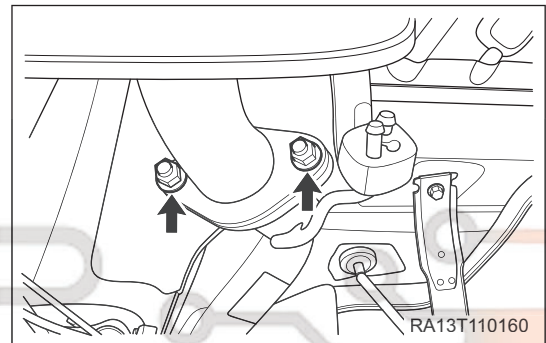
Rear Muffler Assembly

Removal

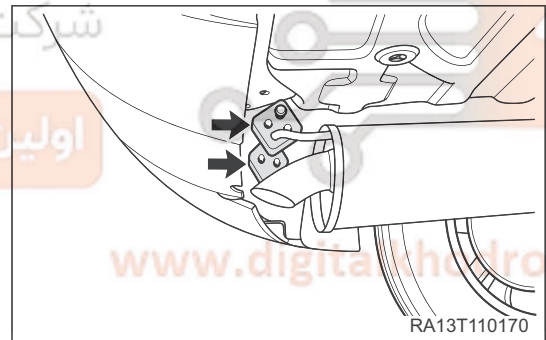
WARNING

- 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.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the rear muffler assembly.
 - a. Remove 2 coupling nuts (arrow), disconnect front muffler assembly and rear muffler assembly, and remove gasket from connecting part.
(Tightening torque: 45 ± 5 N·m)



- b. Detach 2 diamond shaped hanger blocks (arrow) between rear muffler assembly and body hooks.



- c. Remove the rear muffler 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, replace it.
- During installation, make sure that clearance between rear muffler assembly tailpipe and bumper on rear body is more than 30 mm.
- Check for exhaust gas leakage. If gas leaks, tighten the malfunctioning part to prevent leakage. Replace damaged parts as necessary.