

0207 Exhaust

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1 General Information

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1.1 Overview

- The exhaust system is used to discharge engine exhaust, reducing vehicle emissions with the three-way catalytic converter, and eliminating exhaust noise with the silencer.
- When the exhaust system discharges exhaust gases, the oxygen sensor monitors the oxygen content in exhaust gases, with which the engine control module adjusts the air-fuel ratio of the flammable gas mixture to control vehicle emissions and fuel economy to the utmost.
- The exhaust system consists of the following components:
 - a. Exhaust manifold
 - b. Three-way catalytic converter
 - c. Oxygen sensor
 - d. Front exhaust pipe
 - e. Silencer
 - f. Exhaust manifold heat shield
 - g. Gasket
 - h. Bolts and nuts
 - i. Hanger

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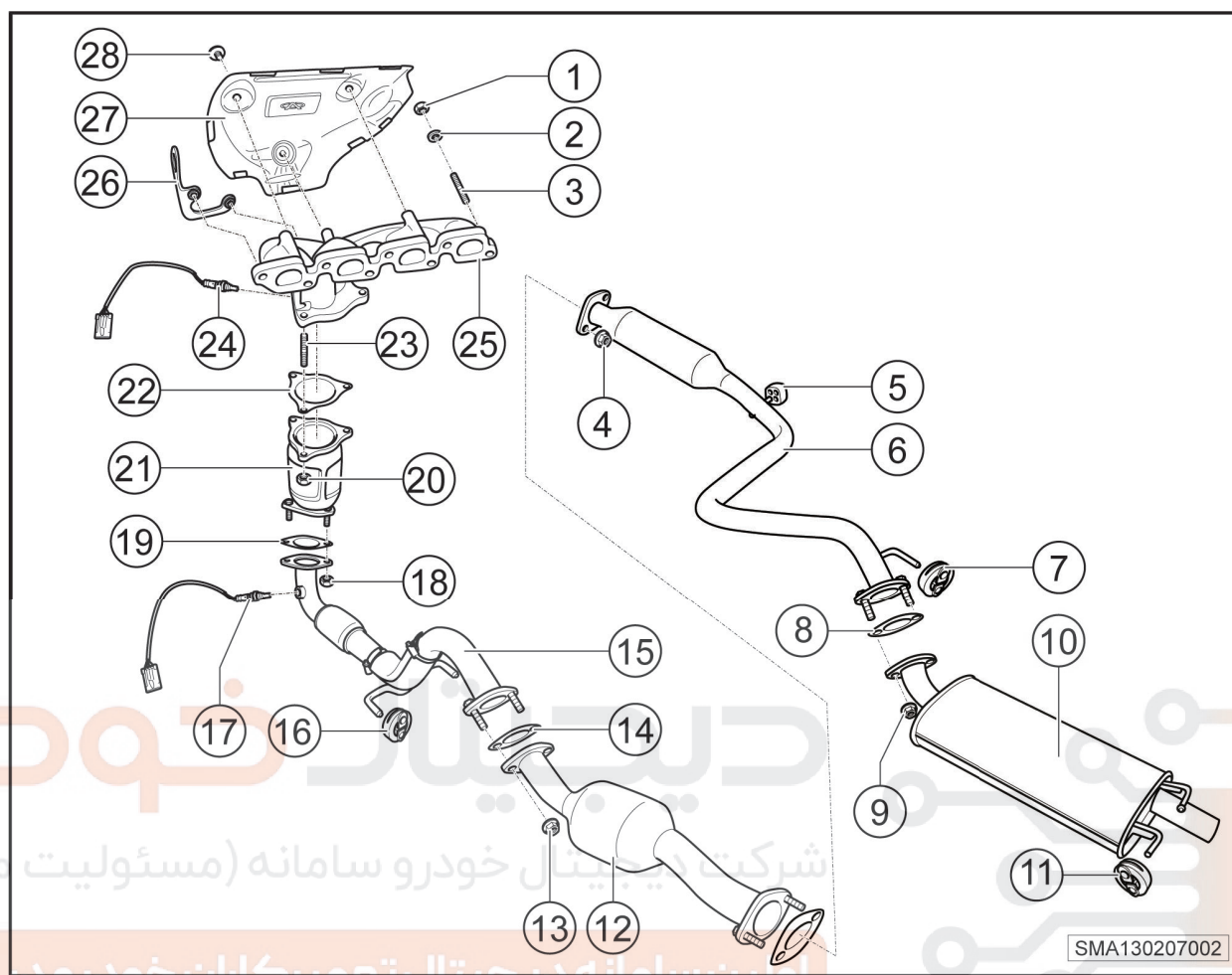
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1.2 Product specifications**Torque specifications**

Component	Torque (N•m)
Exhaust manifold stud	10±2
Exhaust manifold fixing nut	22±2
Front oxygen sensor	45±5
Fixing nut from three-way catalytic preconverter to exhaust manifold	45±5
Fixing nut from front exhaust pipe to three-way catalytic preconverter	45±5
Rear oxygen sensor	45±5
Fixing nut from main three-way catalytic converter to front exhaust pipe	45±5
Fixing nut from front silencer to main three-way catalytic converter	50±5
Fixing nut from main silencer to front silencer	50±5



1.3 The exhaust system assembly drawing



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1. Nut	2. Gasket
3. Stud	4. Nut
5. Hanger	6. Front silencer
7. Hanger	8. Gasket
9. Nut	10. Main silencer
11. Hanger	12. Main three-way catalytic converter
13. Nut	14. Gasket
15. Front exhaust pipe	16. Hanger
17. Rear oxygen sensor	18. Nut
19. Gasket	20. Nut
21. Three-way catalytic preconverter	22. Gasket
23. Stud	24. Front oxygen sensor
25. Exhaust manifold	26. Hanger
27. Exhaust manifold heat shield	28. Nut

2 Diagnosis and Inspection

2.1 Exhaust system fault list220

2.1 Exhaust system fault list

Symptoms	Possible causes	Maintenance recommendations
Excessive exhaust noise	Damage or leakage of the main silencer	Replace the main silencer
	Damage or leakage of the front silencer	Replace the front silencer
	Damage or leakage of the front exhaust pipe	Replace the front exhaust pipe
	Breakage or leakage of the exhaust manifold	Replace the exhaust manifold gasket or the exhaust manifold
Excessive exhaust temperature	Blockage of the three-way catalytic converter	Replace the three-way catalytic converter
	Incorrect ignition timing	Eliminate the ignition system failure or the valve timing fault
	Inadequate gas mixture combustion	Check the ignition coil or the ignition cable and spark plugs
Blockage of the exhaust pipe	Poor quality fuel resulting in blockage of the three-way catalytic converter	Clean the fuel system and replace the three-way catalytic converter
	Engine oil burning resulting in blockage of the three-way catalytic converter	Eliminate the fault causes to repair and replace the three-way catalytic converter
Leakage of the exhaust pipe	Damage of the exhaust pipe connector gasket	Replace the gasket and tighten the bolts as specified
	Warping of the exhaust pipe connector surface	Check and replace if necessary
	Damage of the exhaust pipe	Replace the exhaust pipe

3 Exhaust Manifold

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3.1 Removing and installing the exhaust manifold

Warning

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

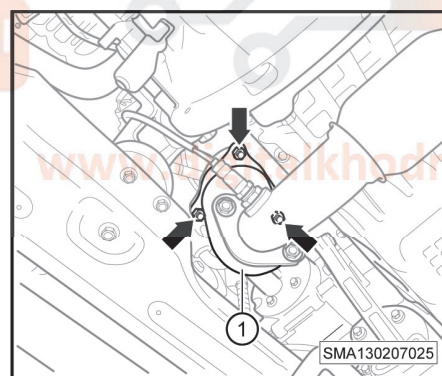
Note

- The corresponding gasket must be replaced during the removal and installation of the exhaust system.
- During installation, please note that do not fix the exhaust device too tight; keep an adequate distance to the vehicle body; and the suspension is evenly loaded.

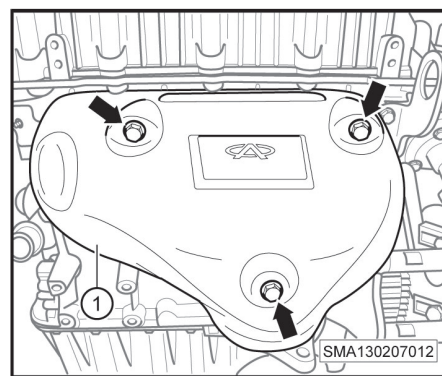
02

Removal

- Switch off all electrical equipment and the ignition switch, and pull out the key.
- Disconnect the battery negative terminal.
- Unscrew the bolt (-arrow-), disengage the connection between the exhaust manifold and the three-way catalytic preconverter (-1-).

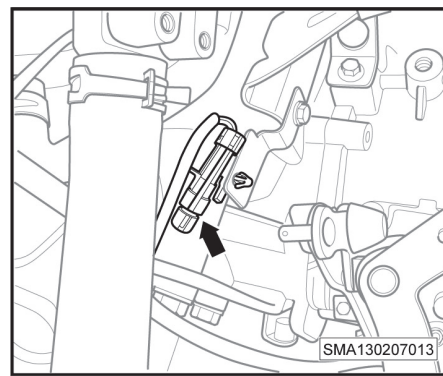


- Unscrew the bolt (-arrow-), remove the exhaust manifold heat shield (-1-).
 - Tightening torque of the exhaust manifold heat shield fixing bolt: $22 \pm 2 \text{ N} \cdot \text{m}$

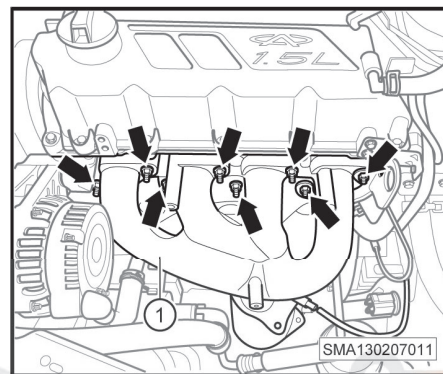


02 - Engine Mechanism

5. Disconnect the front oxygen sensor connector (-arrow-).



6. Unscrew the nut (-arrow-), remove the exhaust manifold (-1-) and the gasket.
- Tightening torque of the exhaust manifold fixing nut: $22 \pm 2 \text{ N}\cdot\text{m}$



02

Installation

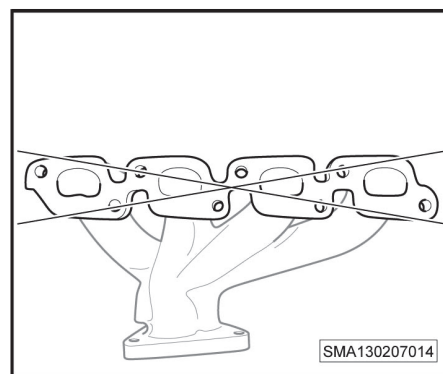
Installation shall follow the reverse sequence of the removal procedure. Please pay attention to the following notes:

1. Replace the gasket.
2. Remove the impurities and rust on the joints and the threads.
3. Tighten the nuts with the specified torque.
4. Apply the treadlocker on the stud head before tightening the exhaust manifold stud.
5. Replace the damaged parts in case of cracks or leakages.

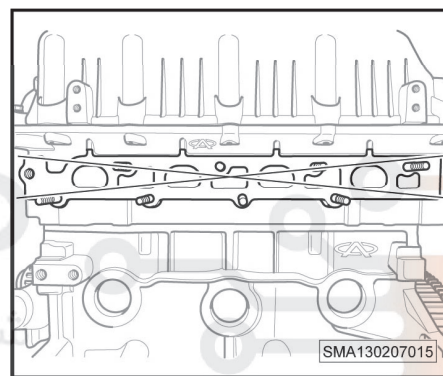
3.2 Checking the surface warpage degree of the exhaust manifold and the cylinder head exhaust side

Methods

1. As shown in the figure, measure the surface warpage degree of the exhaust manifold. Replace it if the surface warpage degree is more than 0.5 mm.



2. As shown in the figure, measure the surface warpage degree of the cylinder head exhaust side. Replace it if the surface warpage degree is more than 0.04 mm.



4 Front Exhaust Pipe

4.1 Removing and installing the front exhaust pipe.....224

4.1 Removing and installing the front exhaust pipe

Warning

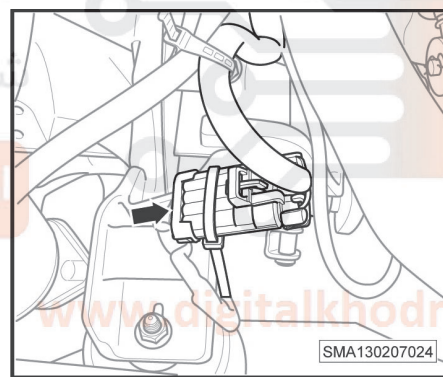
- The temperature of the exhaust system is very high when the engine is running. Before removal and installation, you must make sure that the engine has stopped running and cooled down; otherwise, there is a risk of scald.

Note

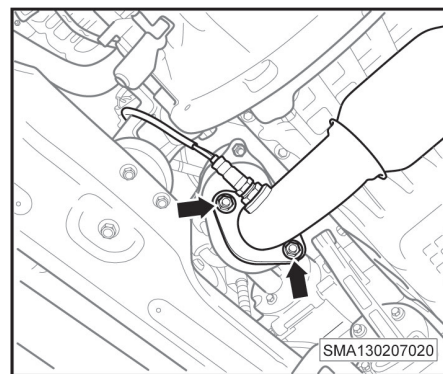
- Gaskets must be replaced during the removal and installation of the exhaust system.
- During installation, please note that do not fix the exhaust device too tight; keep an adequate distance to the vehicle body; and the suspension is evenly loaded.
- Please lubricate the joints with lubricants first to facilitate disengaging the connection between the front exhaust pipe and the hanger.

Removal

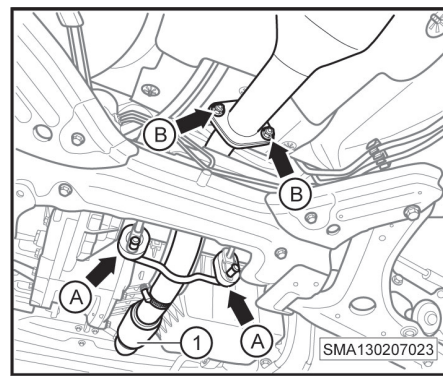
1. Switch off all electrical equipment and the ignition switch, and pull out the key.
2. Disconnect the battery negative terminal.
3. Disconnect the rear oxygen sensor connector (-arrow-).



4. Unscrew the fixing nut (-arrow-), and disengage the connection to the three-way catalytic preconverter.
 - Tightening torque of the nut: $45 \pm 5 \text{ N} \cdot \text{m}$



5. Unscrew the nut (-arrow B-), and disengage the connection to the front silencer. Disengage the hanger (-arrow A-), and remove the front exhaust pipe (-1-).



Installation

Installation shall follow the reverse sequence of the removal procedure. Please pay attention to the following notes:

1. Replace the gasket, and remove the impurities on the joints and the threads.
2. Tighten the fixing nuts with the specified torque.
3. Replace the damaged parts in case of cracks or leakages.

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5 Silencer

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5.2 Removing and installing the front silencer.....	228

5.1 Removing and installing the main silencer

⚠ Warning

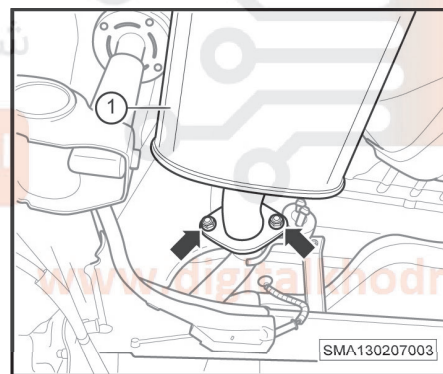
- The temperature of the exhaust system is very high when the engine is running. Before removal and installation, you must make sure that the engine has stopped running and cooled down; otherwise, there is a risk of scald.

i Note

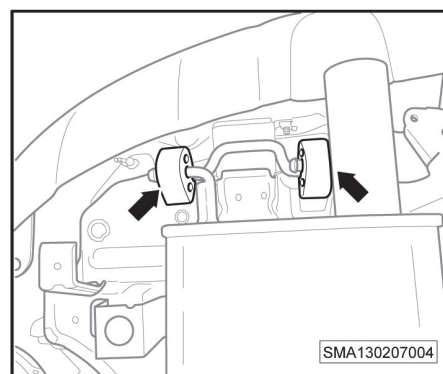
- Gaskets must be replaced during the removal and installation of the exhaust system.
- During installation, please note that do not fix the exhaust device too tight; keep an adequate distance to the vehicle body; and the suspension is evenly loaded.
- Please lubricate the joints with lubricants first to facilitate disengaging the connection between the front exhaust pipe and the hanger.

Removal

- Switch off all electrical equipment and the ignition switch, and pull out the key.
- Unscrew the nut (-arrow-), disengage the connection between the main silencer (-1-) and the front silencer, and remove the gasket.
 - Tightening torque of the fixing nut: $50 \pm 5 \text{ N} \cdot \text{m}$



- Disengage the hanger (-arrow-), and remove the main silencer.



Installation

Installation shall follow the reverse sequence of the removal procedure. Please pay attention to the following notes:

1. Replace the gasket, and remove the impurities on the joints and the threads.
2. Tighten the nuts with the specified torque.
3. Replace the damaged parts in case of cracks or leakages.

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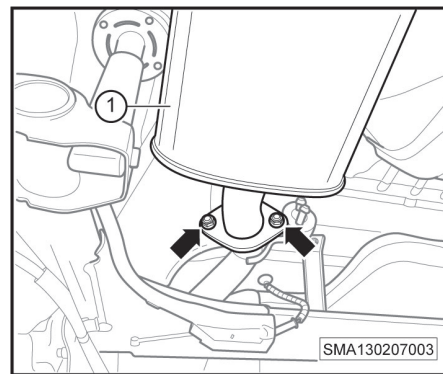
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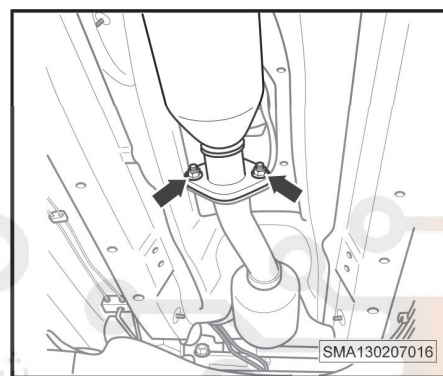
5.2 Removing and installing the front silencer

Removal

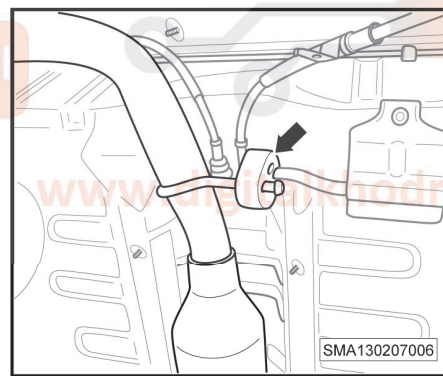
1. Switch off all electrical equipment and the ignition switch, and pull out the key.
2. Unscrew the fixing nut (-arrow-), disengage the connection between the main silencer (-1-) and the front silencer, and remove the gasket.
 - Tightening torque of the fixing nut: $50 \pm 5 \text{ N} \cdot \text{m}$



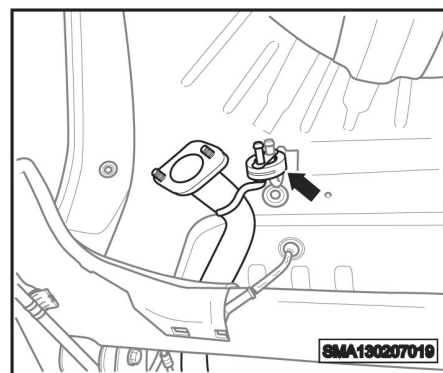
3. Unscrew the nut (-arrow-), disengage the connection between the front silencer and the main three-way catalytic converter, and remove the gasket.
 - Tightening torque of the nut: $50 \pm 5 \text{ N} \cdot \text{m}$



4. Disengage the hanger (-arrow-).



5. Disengage the hanger (-arrow-), and remove the front silencer.



Installation

Installation shall follow the reverse sequence of the removal procedure. Please pay attention to the following notes:

1. Replace the gasket, and remove the impurities on the joints and the threads.
2. Tighten the nuts with the specified torque.
3. Replace the damaged parts in case of cracks or leakages.

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6 Three-way Catalytic Converter

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6.1 Overview

- The three-way catalytic converter is used to convert vehicle emissions like CO, HC, NOx and other harmful gases to harmless carbon dioxide, water and nitrogen through oxidation and reduction.
- When the high-temperature vehicle emissions go through the three-way catalytic converter, the purificant in the catalytic converter will increase the activity of CO, HC and NOx, resulting in some oxidation-reduction reaction, in which CO is oxidated into colorless, non-toxic carbon dioxide, HC into water and carbon dioxide, and NOx into nitrogen and oxygen. The three types of harmful gases are then converted into harmless gases, making the exhaust purified.

⚠ Warning

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

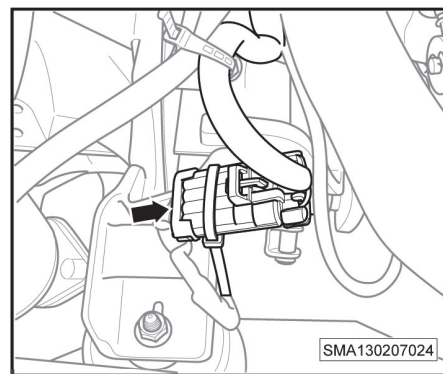
i Note

- Gaskets must be replaced during the removal and installation of the exhaust system.
- During installation, please note that do not fix the exhaust device too tight; keep an adequate distance to the vehicle body; and the suspension is evenly loaded.
- Please lubricate the joints with lubricants first to facilitate disengaging the connection between the front exhaust pipe and the hanger.

6.2 Removing and installing the three-way catalytic preconverter

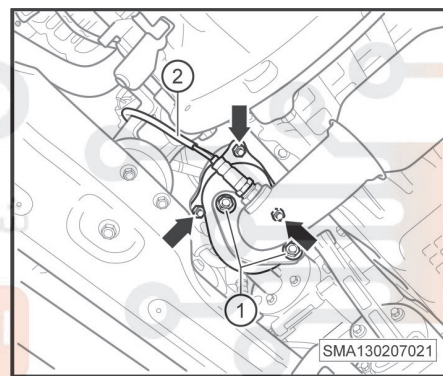
Removal

1. Switch off all electrical equipment and the ignition switch, and pull out the key.
2. Disconnect the battery negative terminal.
3. Disconnect the rear oxygen sensor connector (-arrow-).



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4. Unscrew the nut (-1-), disengage the connection to the front exhaust pipe, and remove the gasket.
 - Tightening torque of the fixing nut: $45 \pm 5 \text{ N}\cdot\text{m}$
5. Unscrew the nut (-arrow-), rock the upper part of the front exhaust pipe to one side. Be careful not to rupture the rear oxygen sensor harness (-2-). Then disengage the connection to the exhaust manifold and remove the three-way catalytic preconverter.
 - Tightening torque of the nut: $45 \pm 5 \text{ N}\cdot\text{m}$



Installation

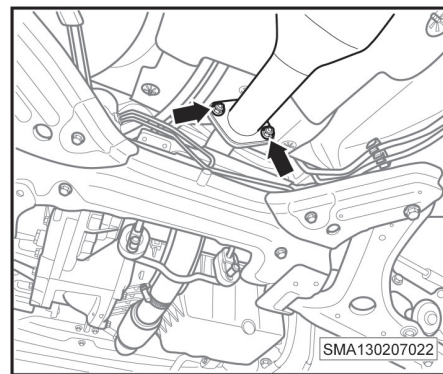
Installation shall follow the reverse sequence of the removal procedure. Please pay attention to the following notes:

1. Replace the gasket, and remove the impurities on the joints and the threads.
2. Tighten the fixing nuts with the specified torque.
3. Replace the damaged parts in case of cracks or leakages.

6.3 Removing and installing the main three-way catalytic converter

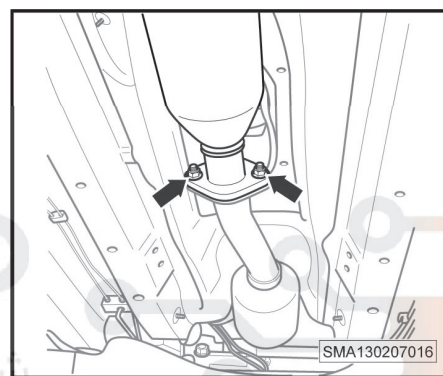
Removal

1. Switch off all electrical equipment and the ignition switch, and pull out the key.
2. Unscrew the nut (-arrow-), disengage the connection to the front exhaust pipe and remove the gasket.
 - Tightening torque of the nut: $45 \pm 5 \text{ N} \cdot \text{m}$



3. Unscrew the nut (-arrow-), disengage the connection to the front silencer, remove the gasket and the main three-way catalytic converter.

- Tightening torque of the nut: $50 \pm 5 \text{ N} \cdot \text{m}$



02

Installation

Installation shall follow the reverse sequence of the removal procedure. Please pay attention to the following notes:

1. Replace the gasket, and remove the impurities on the joints and the threads.
2. Tighten the fixing nuts with the specified torque.
3. Replace the damaged parts in case of cracks or leakages.