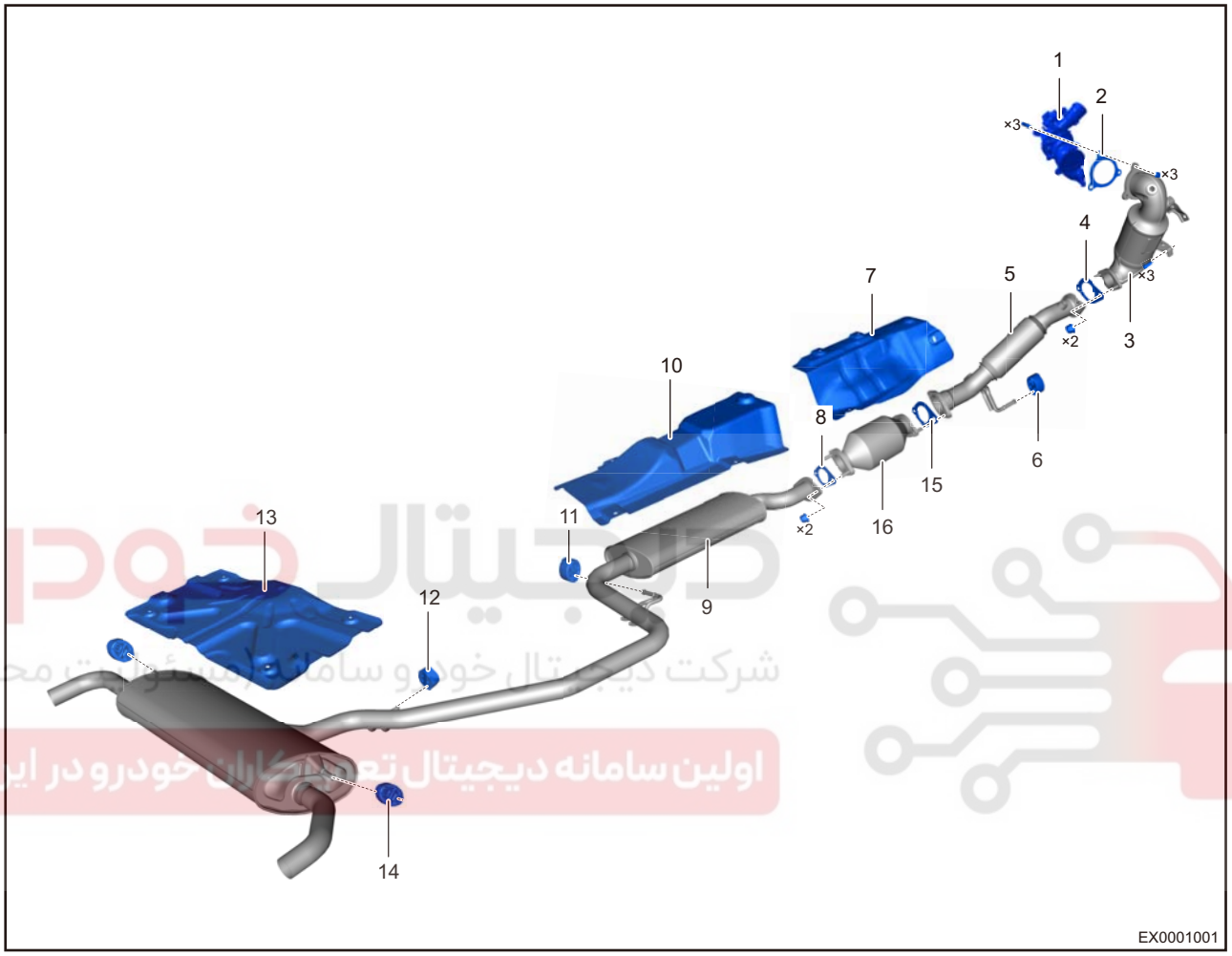
SQRE4T15C EXHAUST SYSTEM

GENERAL INFORMATION

General Information

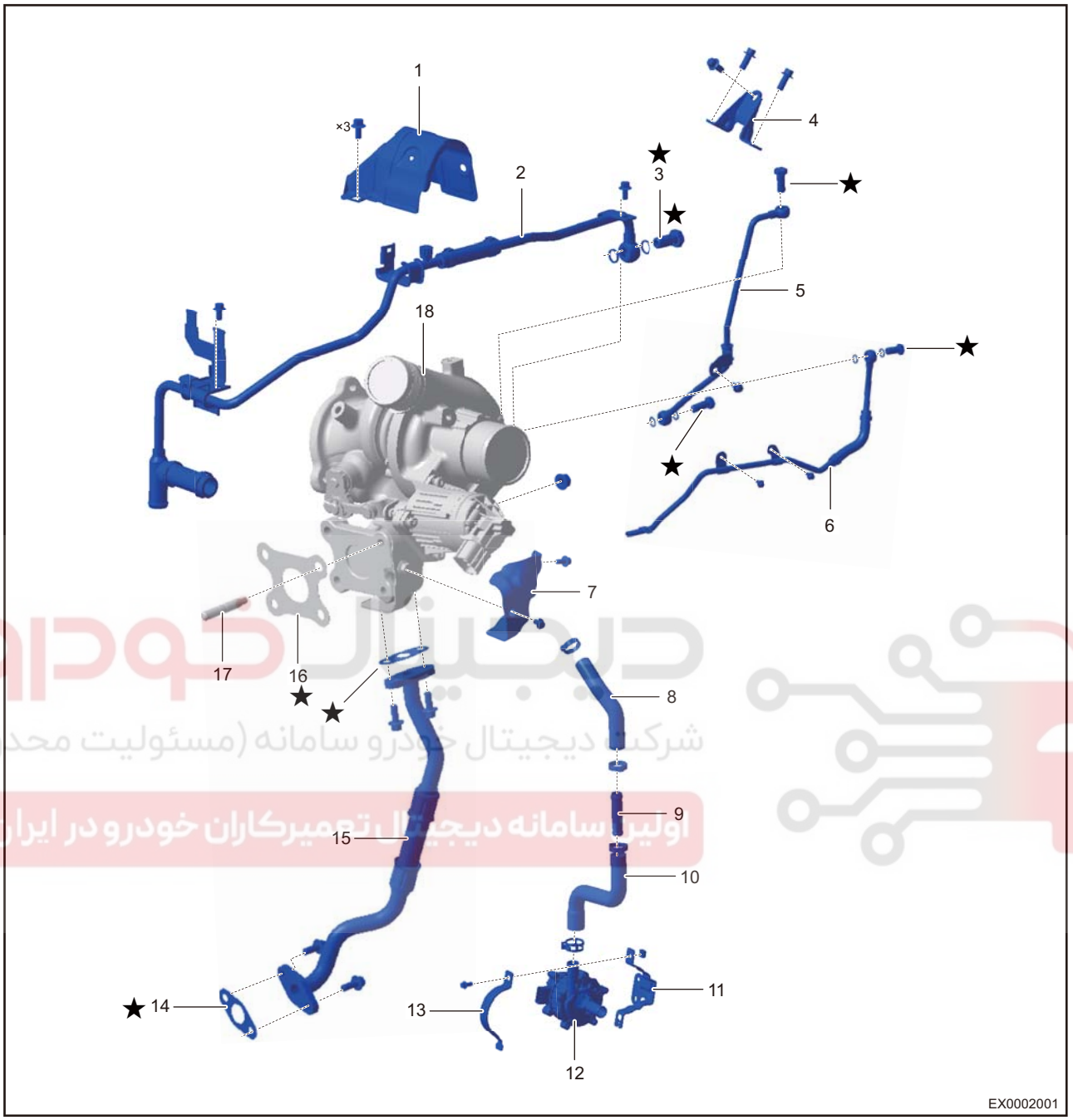
Components

Description



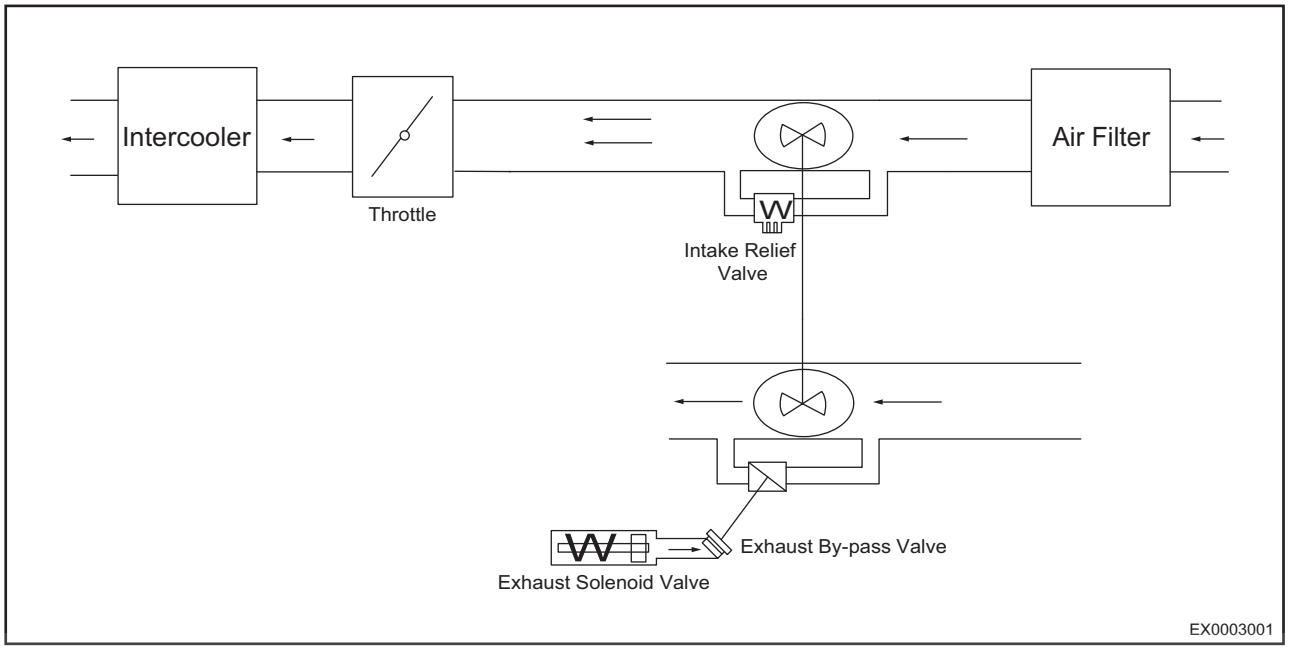
1 - Turbocharger Assembly	2 - Washer Between Turbocharger and Precatalytic Converter
3 - Precatalytic Converter Assembly	4 - Gasket behind Precatalytic Converter
5 - Main Catalytic Converter Assembly	6 - Hanger Block 2
7 - Muffler Heat Insulator II	8 - Gasket
9 - Muffler Assembly	10 - Muffler Heat Insulator III
11 - Hanger Block 2	12 - Hanger Block II
13 - Muffler Heat Insulator I	14 - Hanger Block 2
15 - Gasket	16 - Main Catalytic Converter Assembly

Turbocharger



1 - Turbocharger Heat Insulator	2 - Turbocharger Water Outlet Pipe Set
3 - Hollow Bolt	4 - Turbocharger Bracket
5 - Turbocharger Inlet Pipe	6 - Turbocharger Water Inlet Pipe Set
7 - Turbocharger Heat Insulator II	8 - Water Outlet Hose
9 - Water Outlet Hose Connection	10 - Water Outlet Hose
11 - Electric Water Pump Bracket 1	12 - Electric Water Pump Assembly
13 - Electric Water Pump Bracket 2	14 - Oil Return Pipe Washer
15 - Turbocharger Oil Return Pipe	16 - Turbocharger washer
17 - High Temperature Stud	18 - Turbocharger
★ - Non-reusable Parts	

Operation



Turbocharger use motor to drive the turbo impeller to rotate, then drive compressor impeller to pressurize the air pressed through air filter and send it into cylinder. As more air enters into cylinder, more fuel is allowed to be injected, which results in higher engine power. In addition, the turbocharger can also make the engine get power compensation when it works in highland.

Specifications

Torque Specifications

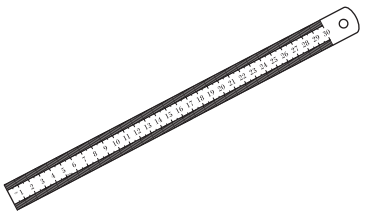
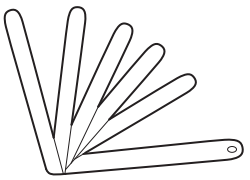
Description	Torque (N·m)
High Temperature Stud	14 + 3
High Temperature Nut	20 + 3
Turbocharger Corresponding Water Inlet Threaded Hole Hollow Bolt	25 + 3
Turbocharger Oil Return Pipe Hexagon Flange Face Bolt	8 + 3
Turbocharger Inlet Pipe Hollow Bolt	20 + 3
Heat Insulator Bolt	8 + 3
Muffler Hose Lower Worm Clamp (I)	3 + 0.5
Turbocharger Heat Insulator Hexagon Flange Face Bolt	9 ± 1.5
Muffler Hose Upper and Lower Worm Clamp (II)	5 ± 1
Turbocharger Bracket Fixing Bolt	33 ± 3.5
Turbocharger Heat Insulator Fixing Bolt	9 ± 1.5
Turbocharger Fixing Nut	25 ± 5
Exhaust By-pass Control Solenoid Valve Fixing Bolt	3 + 2
Electronic Water Pump Assembly Fixing Bolt	8 + 3
Electronic Water Pump Bracket Fixing Bolt	8 + 3

Non-reusable Part

Non-reusable Part	
High Temperature Nut (Turbocharger)	Replace
Turbocharger Washer	Replace
Washer (Hollow Bolt)	Replace
Oil Return Pipe Washer	Replace

Tools

General Tools

Precision Straightedge	 RCH0063006
Feeler Gauge	 RCH0060006

DIAGNOSIS & TESTING

Diagnosis & Testing

Problem Symptoms Table

Hint:

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

Symptom	Suspected Area
Excessive exhaust noise	Exhaust pipe (loose connection)
	Main catalytic converter assembly (damaged or leaked)
	Muffler assembly (damaged or leaked)
	Exhaust pipe gasket (damaged)
	Turbocharger damaged
Excessive exhaust temperature	Main catalytic converter assembly (blocked)
	Precatalytic converter assembly (blocked)
	Inadequate gas mixture combustion
Exhaust pipe leakage	Exhaust pipe gasket (damaged)
	Main catalytic converter assembly (damaged or leaked)
	Muffler assembly (damaged or leaked)

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 the exhaust pipe joint is allowed, but gas leakage at the joint between turbocharger and cylinder head or precatalytic converter is prohibited. The judging standard is that engine does not shudder and no "poof" sound is heard from the joints.

ON-VEHICLE SERVICE

Turbocharger Heat Insulator Assembly

Removal

Warning/Caution/Hint

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.

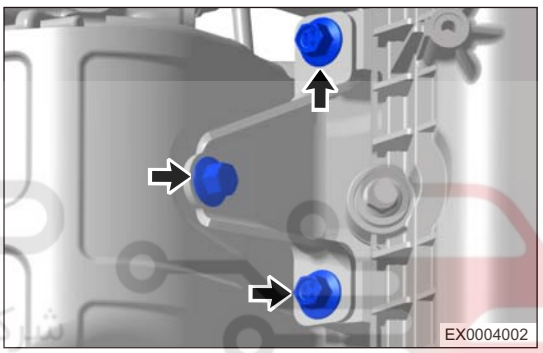
Caution:

- 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 ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the turbocharger fixing bracket.

   (a) Remove 3 fixing bolts (arrow) from turbocharger fixing bracket.

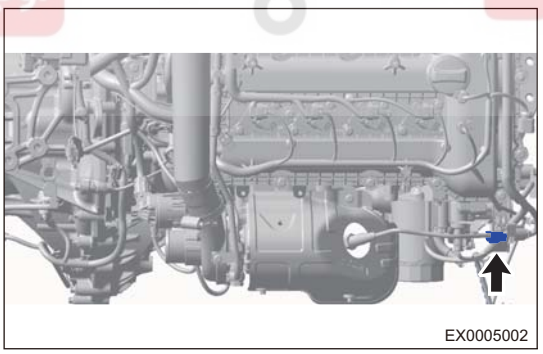
   Tightening torque
   33 ± 3.5 N·m



   (b) Remove the turbocharger fixing bracket.

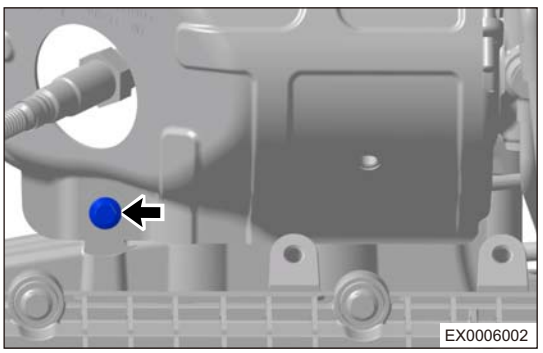
4. Remove turbocharger heat insulator assembly.

   (a) Disconnect the upstream oxygen sensor connector (arrow).



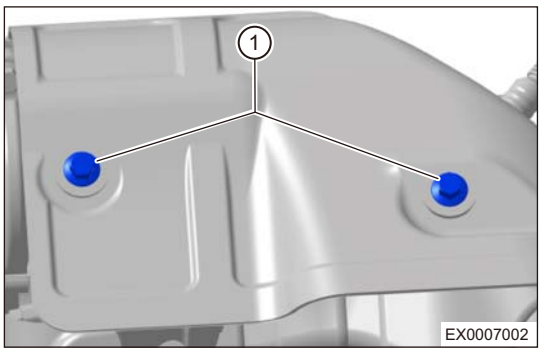
   (b) Remove turbocharger heat insulator fixing bolt (arrow).

   Tightening torque
   9 ± 1.5 N·m



(c) Remove 2 fixing bolts (1) from turbocharger heat insulator.

Tightening torque
8 ± 3 N·m

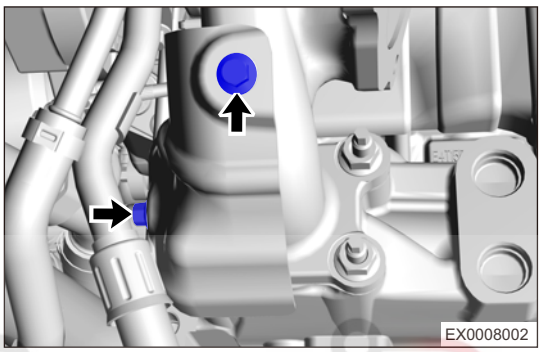


(d) Remove turbocharger heat insulator assembly.

5. Remove the turbocharger heat insulator II.

(a) Remove 2 fixing bolts (arrow) from turbocharger heat insulator II.

Tightening torque
8 + 3 N·m



(b) Remove turbocharger heat insulator II.

Installation

1. Installation is in the reverse order of removal.

Turbocharger Assembly

Removal

Warning/Caution/Hint

Warning:

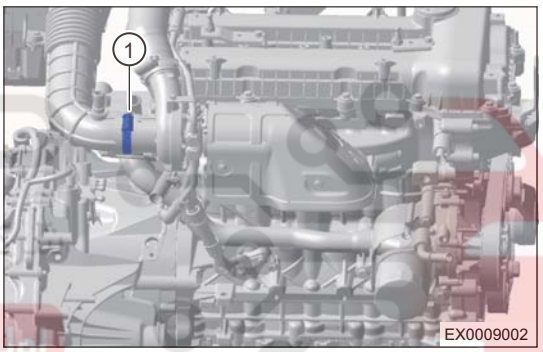
- Temperature of exhaust system is very high when engine is running. Before removal, make sure that engine has stopped running and exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.

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 ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Drain the coolant.
5. Remove the muffler assembly.
6. Remove the precatalytic converter assembly.
7. Remove the intake hose assembly.

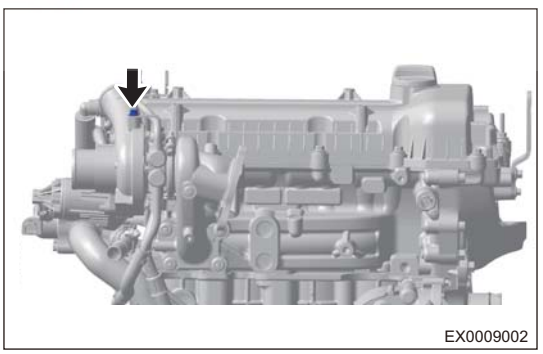
   (a) Loosen worm clamp (1) and disconnect intake hose assembly.



8. Remove turbocharger water outlet pipe set assembly.

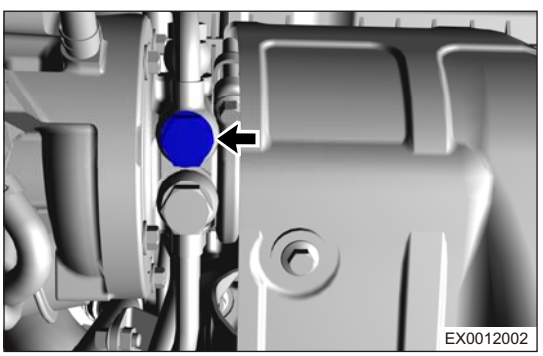
   (a) Remove 1 fixing bolt (arrow) between turbocharger outlet hose bracket and muffler.

   Tightening torque
   8 + 3 N·m



   (b) Remove the hollow bolt (arrow) between turbocharger water outlet pipe set and turbocharger assembly.

   Tightening torque
   20 + 3 N·m

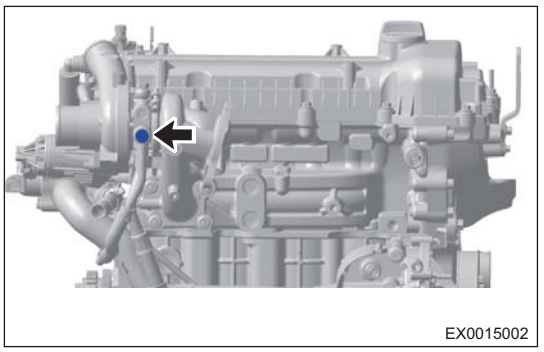


(c) Remove the turbocharger water outlet pipe set.
Caution:
- Pay attention not to drop upper and lower washers of hollow bolt during removal and do not reuse them.

9. Remove the turbocharger water inlet pipe set assembly.

(a) Remove the hollow bolt (arrow) between turbocharger water outlet pipe set and turbocharger assembly.

Tightening torque
20 + 3 N·m

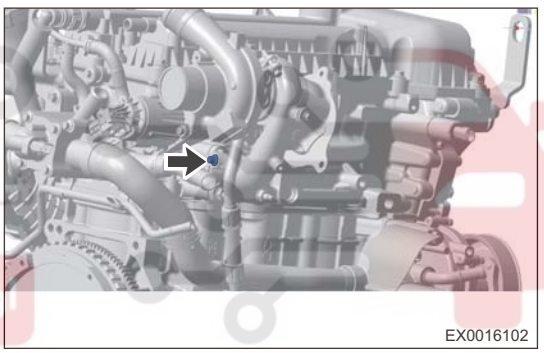

EX0015002

(b) Remove the turbocharger water inlet pipe set.
Caution:
- Pay attention not to drop upper and lower washers of hollow bolt during removal and do not reuse them.

10. Remove the turbocharger oil return pipe assembly.

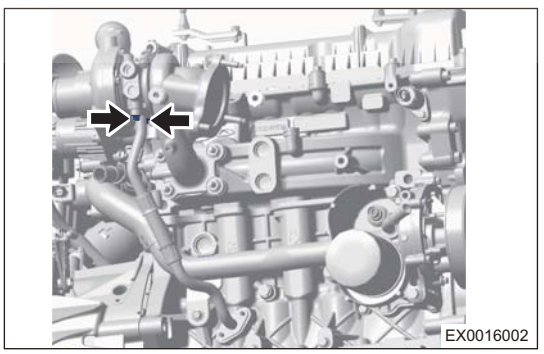
(a) Remove 1 fixing bolt (arrow) from oil return pipe bracket.

Tightening torque
8 + 3 N·m


EX0016102

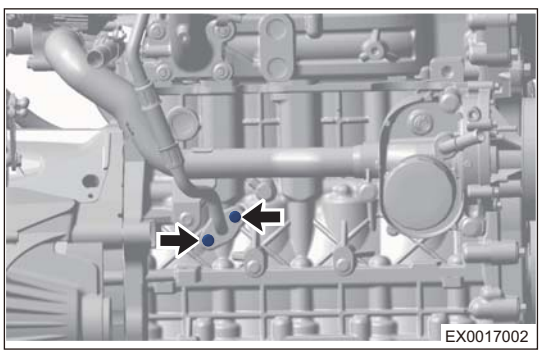
(b) Remove 2 fixing bolts (arrow) from turbocharger oil return pipe and turbocharger assembly.

Tightening torque
8 + 3 N·m


EX0016002

(c) Remove 2 fixing bolts (arrow) between turbocharger oil return pipe and cylinder block assembly.

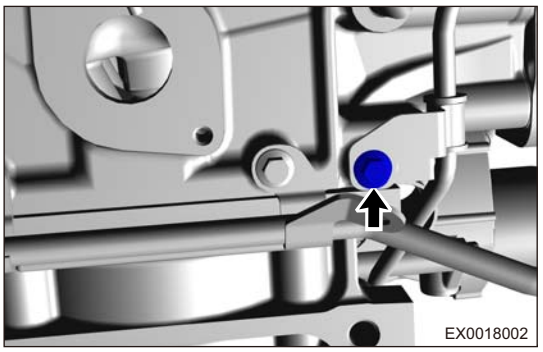
Tightening torque
8 + 3 N·m


EX0017002

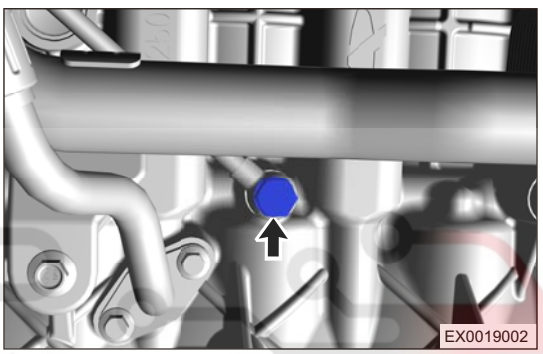
(d) Remove the turbocharger oil return pipe assembly.
Caution:
- Pay attention not to drop upper and lower washer and bolts during removal and the bolt cannot be reused.

11. Remove the turbocharger oil inlet pipe assembly.

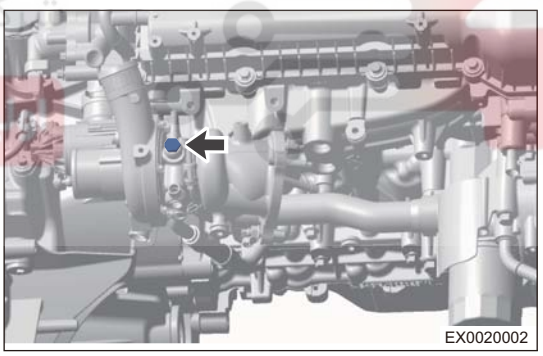
(a) Remove the turbocharger oil inlet pipe bracket fixing bolt (arrow).
Tightening torque
8 + 3 N·m



(b) Remove fixing bolt (arrow) between turbocharger oil inlet pipe and cylinder block assembly.
Tightening torque
20 + 5 N·m



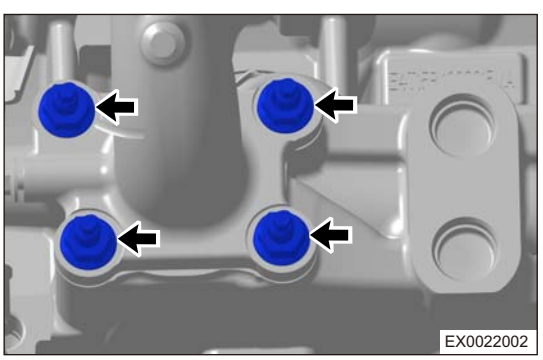
(c) Remove hollow bolt (arrow) between turbocharger oil inlet pipe and turbocharger assembly.
Tightening torque
20 + 5 N·m



(d) Remove the turbocharger oil inlet pipe assembly.
Caution:
- Pay attention not to drop upper and lower washers of hollow bolt during removal and do not reuse them.

12. Remove the turbocharger assembly.

(a) Remove 4 fixing nuts (arrow) from turbocharger assembly.
Tightening torque
25 + 5 N·m



(b) Remove the turbocharger assembly.

Inspection

1. When there is a DTC of too high or too low boost pressure or power drop, the basic inspection of the turbocharging system should be performed first.

   Basic inspection:
   - Check there are no cranks causing by overheating, biting, deformation or other damage on turbocharger turbo housing, otherwise, replace turbocharger.
   - Check there are no deposition and blocking on turbo oil hole.
   - Check there are no blockage, squash, deformation or other damage on oil inlet and return pipes of turbocharger.
   - Check there are no oil leakage (inside leakage and outside leakage) on turbocharger.
   - Check that charcoal canister check valve between charcoal canister and turbocharger front intake hose and check valve between brake booster and intake manifold are correctly installed with the arrow above points to conduction direction (fault prone points).
   - Check that all lines are connected securely without leakage, aging, breakage, etc.
2. Turbocharger daily inspection
   (a) Check the sealing and tightness of connecting lines between air filter and turbocharger, turbocharger and engine exhaust pipe.
   (b) Check if turbocharger oil inlet pipe and return pipe are damaged or throttling, and if the connecting bolts of joints are loose.
   (c) Check quality of oil, clean or replace the oil element.
   (d) Check the air filter and clean or replace the element regularly.
   (e) Check if engine crankcase blow-by gas is too large, breather is smooth, ensure crankcase pressure is normal.
3. Other requirements of turbocharger
   (a) Avoid low engine idle for long time (maximum should not exceed 20 minutes).
   (b) Never use the operation with "Accelerate - Stall - Neutral coasting",before the engine lubricating oil pressure is established, the engine must be kept in idling condition (3 to 5 minutes).
   (c) Before stopping the engine, let it gradually decrease its temperature and speed from maximum value (3 to 5 minutes).

Installation

Warning/Caution/Hint

Caution:

- Replace high temperature nut and washer, and clean foreign matters on connection part.
- Check for air leakage, if so, check if each nut or bolt is tightened; if component is damaged, replace it.

1. Installation is in the reverse order of removal.

Precatalytic Converter Assembly

Removal

Warning/Caution/Hint

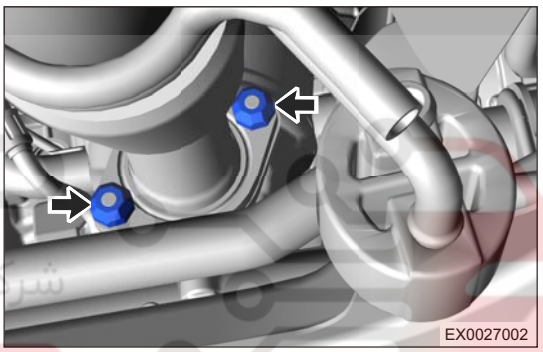
Warning:

- 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.

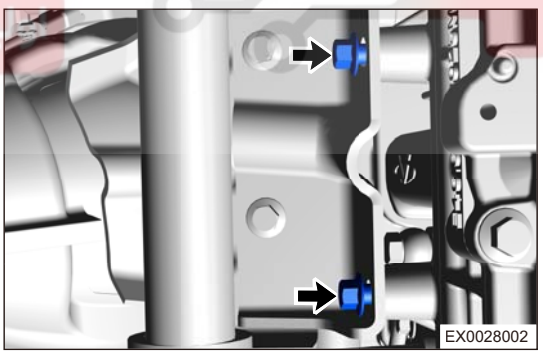
Caution:

- 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.

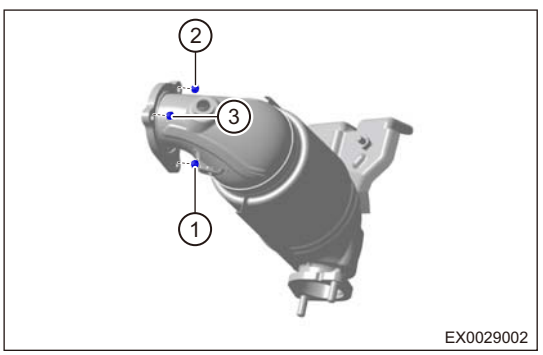
1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove turbocharger heat insulator assembly.
5. Remove the precatalytic converter assembly.
   (a) Raise the vehicle to a proper position.
   (b) Remove 2 fixing nuts (arrow) between precatalytic converter assembly and front exhaust pipe.
   Tightening torque
   45 ± 5 N·m



   (c) Remove 2 fixing bolts (arrow) from precatalytic converter assembly bracket.
   Tightening torque
   20 + 5 N·m



   (d) Remove 3 fixing nuts (1) (2) (3) between precatalytic converter assembly and turbocharger.
   Tightening torque
   33 ± 3 N·m
   Hint:
   Replace the nut with a new one after each removal/ installation, and do not reuse it.



(e) Remove the precatalytic converter assembly.

(f) Remove the upstream oxygen sensor (arrow) from precatalytic converter assembly.

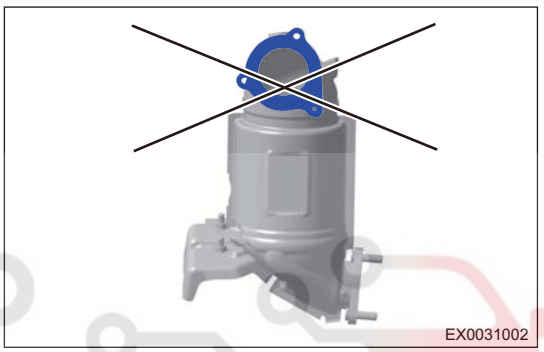
Tightening torque
45 ± 5 N·m


EX0056002

Inspection

1. Inspect warpage on precatalytic converter connection surface.

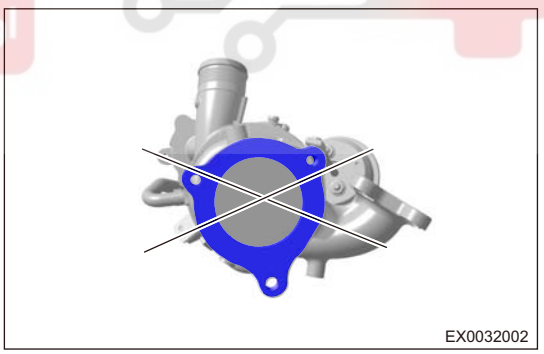
(a) Using a precision straightedge and feeler gauge, measure the connection surface between precatalytic converter body and turbocharger, replace it if the surface warpage is above 0.5 mm.


EX0031002

(b) Check precatalytic converter internal carrier for cracked or blocked. Replace precatalytic converter assembly if damaged.

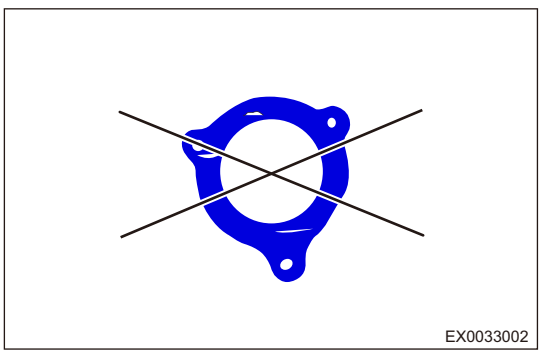
2. Check bending on turbocharger connection surface.

(a) Using a precision straightedge and feeler gauge, measure the connection surface between turbocharger body and precatalytic converter, replace it if the surface bending is above 0.04 mm.


EX0032002

3. Check the gasket.

(a) Check the gasket, there should be no scratches or rough, otherwise replace it.


EX0033002

Installation

Warning/Caution/Hint

Caution:

- If gasket is damaged, replace it, and remove foreign matters on joints and threads.
- If there is any crack or leakage in precatalytic converter assembly, replace it.
- Check that there is no exhaust gas leakage in connecting part of upstream oxygen sensor.
- Check that there is no exhaust gas leakage between precatalytic converter assembly and turbocharger, precatalytic converter assembly and front exhaust pipe assembly after installation.

1. Installation is in the reverse order of removal.

Front Exhaust Pipe Assembly

Removal

Warning/Caution/Hint

Warning:

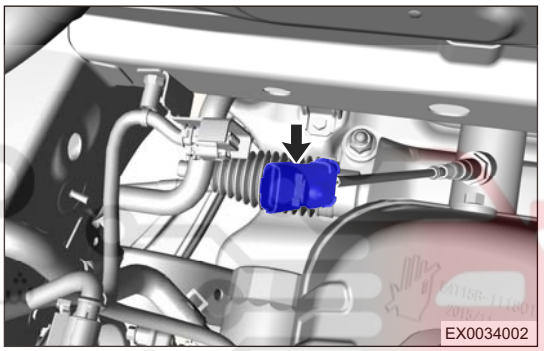
- Temperature of exhaust system is very high when engine is running. Before removal, make sure that engine has stopped running and exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.

Caution:

- When removing front exhaust pipe assembly, an assistant is needed to hold it. This can prevent front muffler assembly from dropping during operation, 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 ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Raise vehicle to a proper height.
4. Remove the front exhaust pipe assembly.

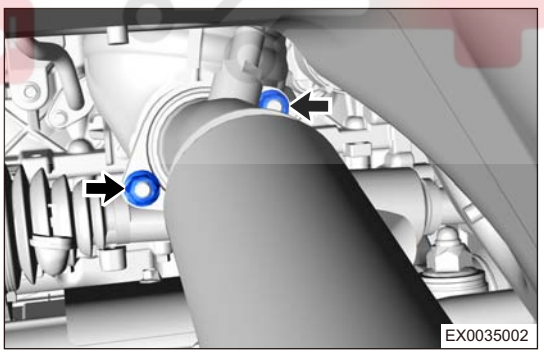
(a) Take off and disconnect the downstream oxygen sensor connector (arrow) from bracket.



(b) Remove 2 fixing nuts, then disconnect connection between front exhaust pipe assembly and precatalytic converter assembly, and take off the gasket from connecting part.

Tightening torque

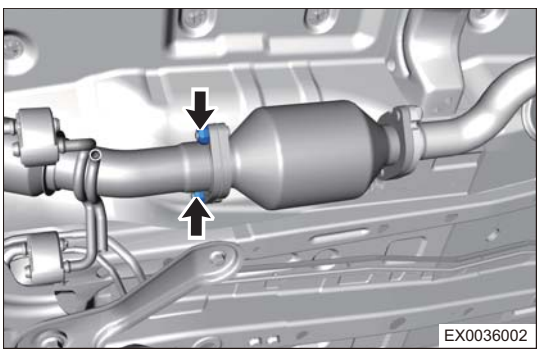
45 ± 5 N·m



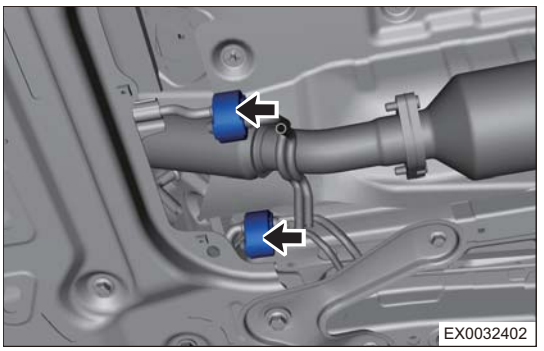
(c) Remove 2 coupling nuts (arrow), then disconnect connection between front exhaust pipe assembly and main catalytic converter, and take off the gasket from connecting part.

Tightening torque

45 ± 5 N·m



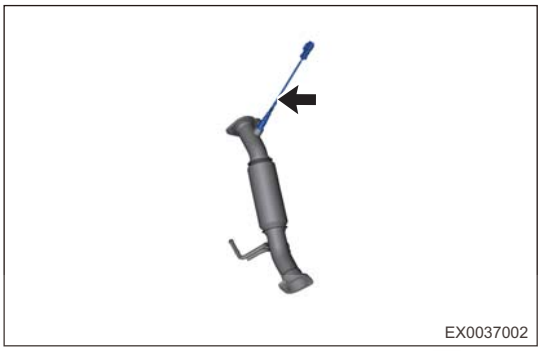
(d) Separate 2 fixing hanger blocks II (arrow) between front exhaust pipe assembly and body hook.



(e) Remove the front exhaust pipe assembly.

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

Tightening torque
45 ± 5 N·m



Installation

Warning/Caution/Hint

Warning:

- If gasket is damaged, replace it, and remove foreign matters on joints and threads.
- Check exhaust gas for leakage. If gas leaks, tighten 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.

1. Installation is in the reverse order of removal.

Main Catalytic Converter Assembly

Removal

Warning/Caution/Hint

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.

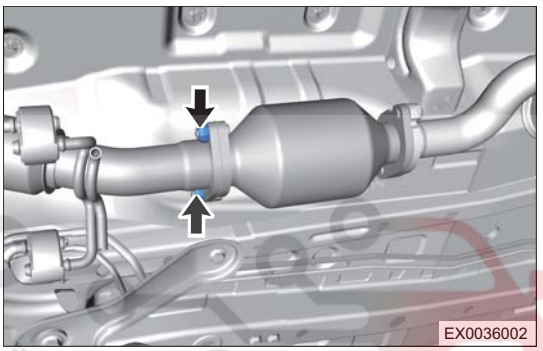
Caution:

- 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 ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Raise the vehicle to a proper position.
4. Remove the main catalytic converter assembly.

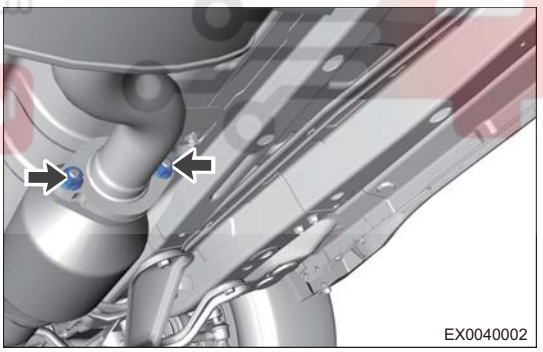
(a) Remove 2 coupling nuts (arrow), then disconnect connection between front exhaust pipe assembly and main catalytic converter assembly.

Tightening torque
45 ± 5 N·m



(b) Remove 2 fixing nuts (arrow) between main catalytic converter assembly and muffler assembly.

Tightening torque
45 ± 5 N·m



(c) Carefully remove the main catalytic converter assembly and gasket.

Installation

Warning/Caution/Hint

Caution:

- If gasket is damaged, replace it, and remove foreign matters on joints and threads.

1. Installation is in the reverse order of removal.

Muffler Assembly

Removal

Warning/Caution/Hint

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:

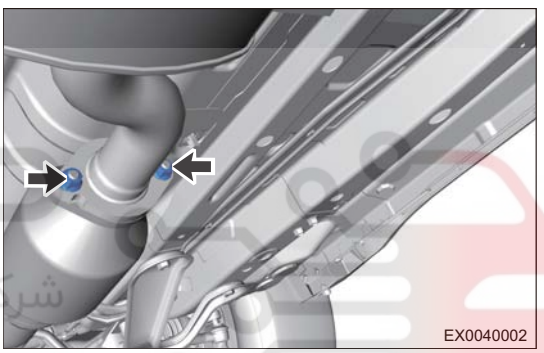
- When removing rear muffler assembly, an assistant is needed to hold it. This can prevent rear muffler assembly from dropping during operation, which may cause an accident.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being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

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Raise the vehicle to a proper position.
4. Remove the muffler assembly.

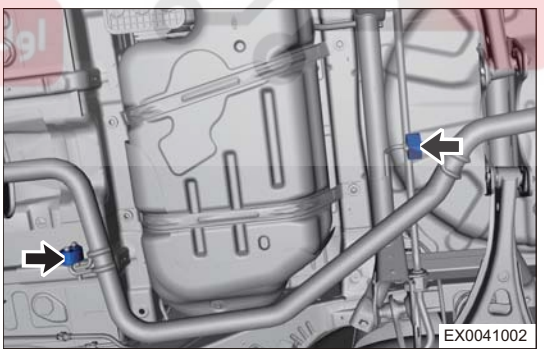
(a) Remove 2 fixing nuts (arrow) between muffler assembly and main catalytic converter assembly.

Tightening torque

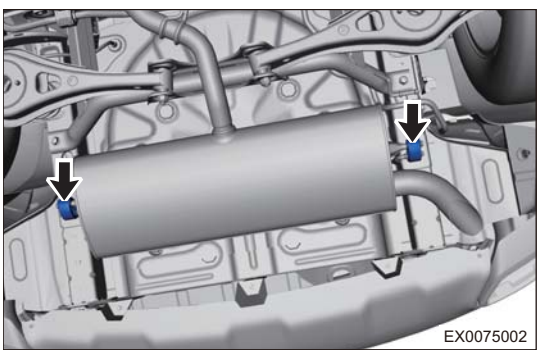
45 ± 5 N·m



(b) Separate 2 fixing hanger blocks II (arrow) between muffler assembly and body hook.



(c) Separate 2 fixing hanger blocks II (arrow) between rear part of muffler assembly and body hook.



(d) Carefully remove the muffler assembly.

Installation

Warning/Caution/Hint

Caution:

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

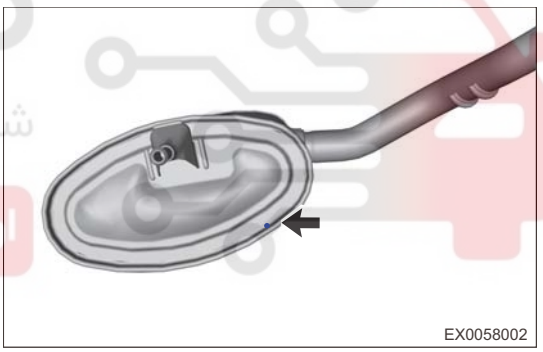
1. Installation is in the reverse order of removal.

Inspection

1. Inspect muffler assembly.
   (a) Inspect if there are cracks or leakage on muffler assembly surface. Replace it if necessary.


EX0057002

   (b) Inspect if there are blocked or normal draining on muffler left and right drain holes (arrow). Whether the water can be drained normally.


EX0058002

Hint:
Due to limited position of muffler drain hole and in the cold area, recommend that the customer do not park the vehicle on the slope with excessive angle as this may result in serious hydrops of muffler to freeze while driving the vehicle. It may cause engine to fail to start.

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