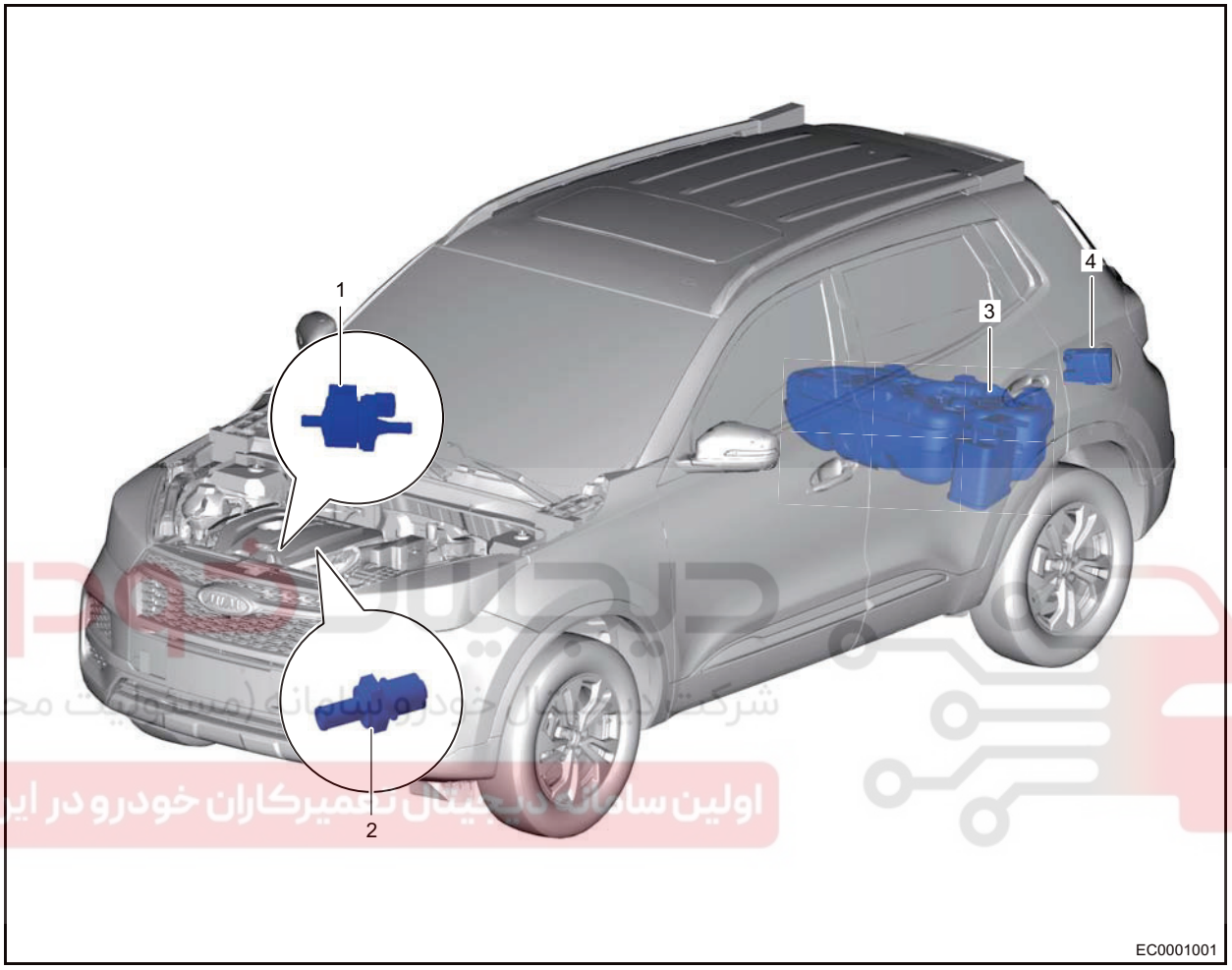
SQRE4T15B EXHAUST SYSTEM

GENERAL INFORMATION

Overview

Description



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

Operation

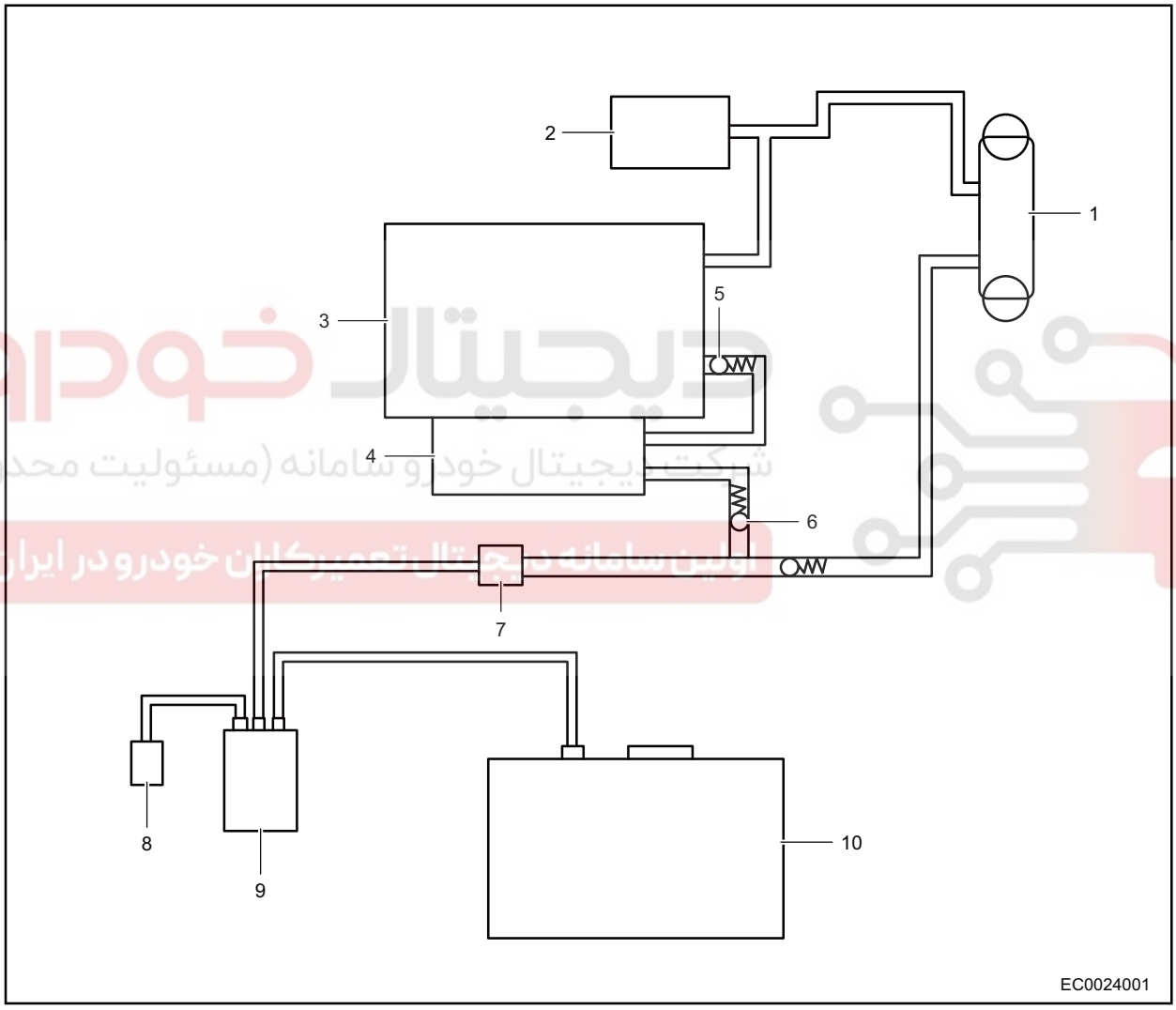
- Emission control system recovers and burns fuel vapor to prevent the vapor in fuel tank from being discharged into the atmosphere. It monitors the oxygen content in exhaust gas, so as to guarantee the maximum efficiency of catalytic converter assembly in converting the HC, CO and NOx in exhaust gas. 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 pipe. When engine stops operating, the fuel vapor and fresh air will be stored in the activated charcoal canister assembly. When engine operation canister solenoid valve opens, the fuel vapor will enter intake manifold and burns in the cylinder.
- 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 the HC, CO and NOx in exhaust gas.

Specifications

Torque Specifications

Description	Torque (N·m)
Coupling Bolt Between Activated Charcoal Canister Assembly and Body	7 ± 1
Upstream Oxygen Sensor	45 ± 5
Downstream Oxygen Sensor	45 ± 5
Coupling Bolt Between Activated Charcoal Canister Filter and Body	7 ± 1
PCV Valve Tightening Torque	4 ± 1

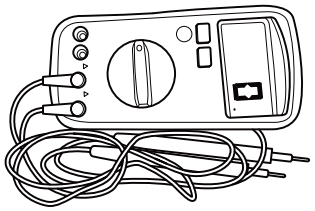
Emission Control System Schematic Diagram



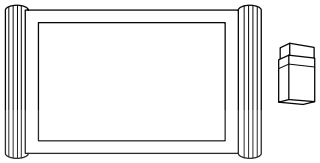
1 - Intake Hose	2 - Turbocharger
3 - Engine	4 - Intake Manifold
5 - PCV Valve	6 - Check Valve
7 - Charcoal Canister Solenoid Valve	8 - Charcoal Canister Filter
9 - Charcoal Canister	10 - Fuel Tank

Tools

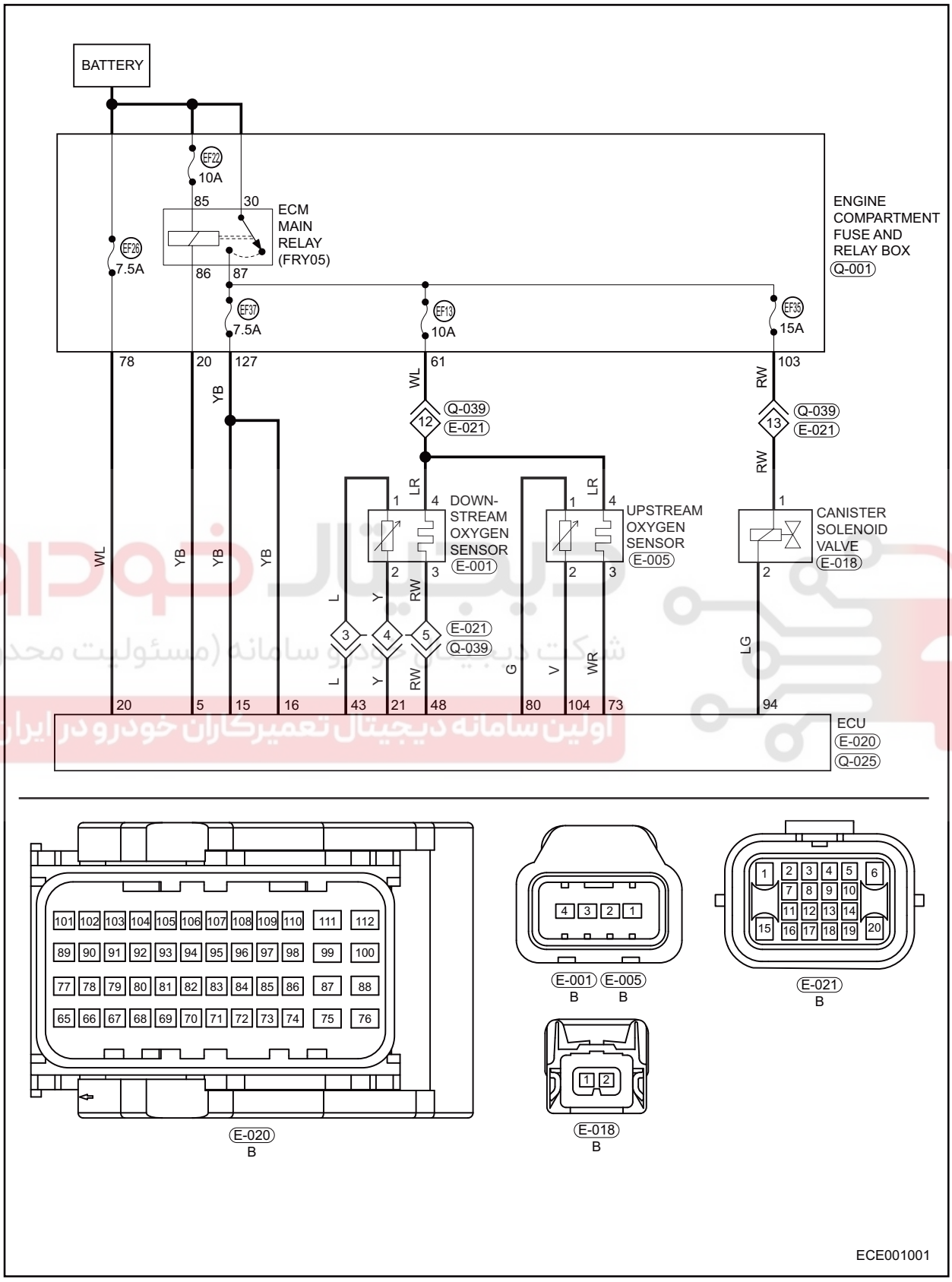
General Tool

Digital Multimeter	 002

Special Tool

X-431 PAD Diagnostic Tester	 001

Exhaust System Diagram (Page 1 of 1)



DIAGNOSIS & TESTING

Leakage Inspection

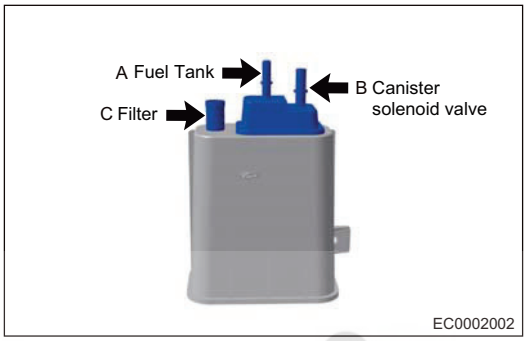
Visually check that hoses and connections have no leaks or damage.

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 disconnections, looseness or cracks in intake system pipes related to throttle assembly will result in engine failure or abnormal operation. Replace the parts as necessary.

Activated Charcoal Canister Inspection

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



2. Close port C and blow compressed air into port B, check that air flows from port A. If result is not as specified, replace the canister.
3. Close port A and use vacuum pump to pump the vacuum from port B, check that air enters from port C. If it is not as specified, replace the filter and canister.

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 the fuel tank cap assembly.

ON-VEHICLE SERVICE

Canister Solenoid Valve

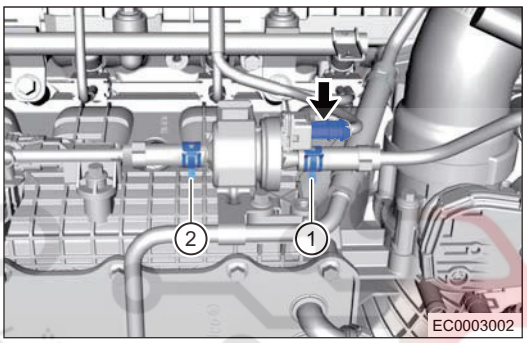
Removal

Warning/Caution/Hint

Caution:

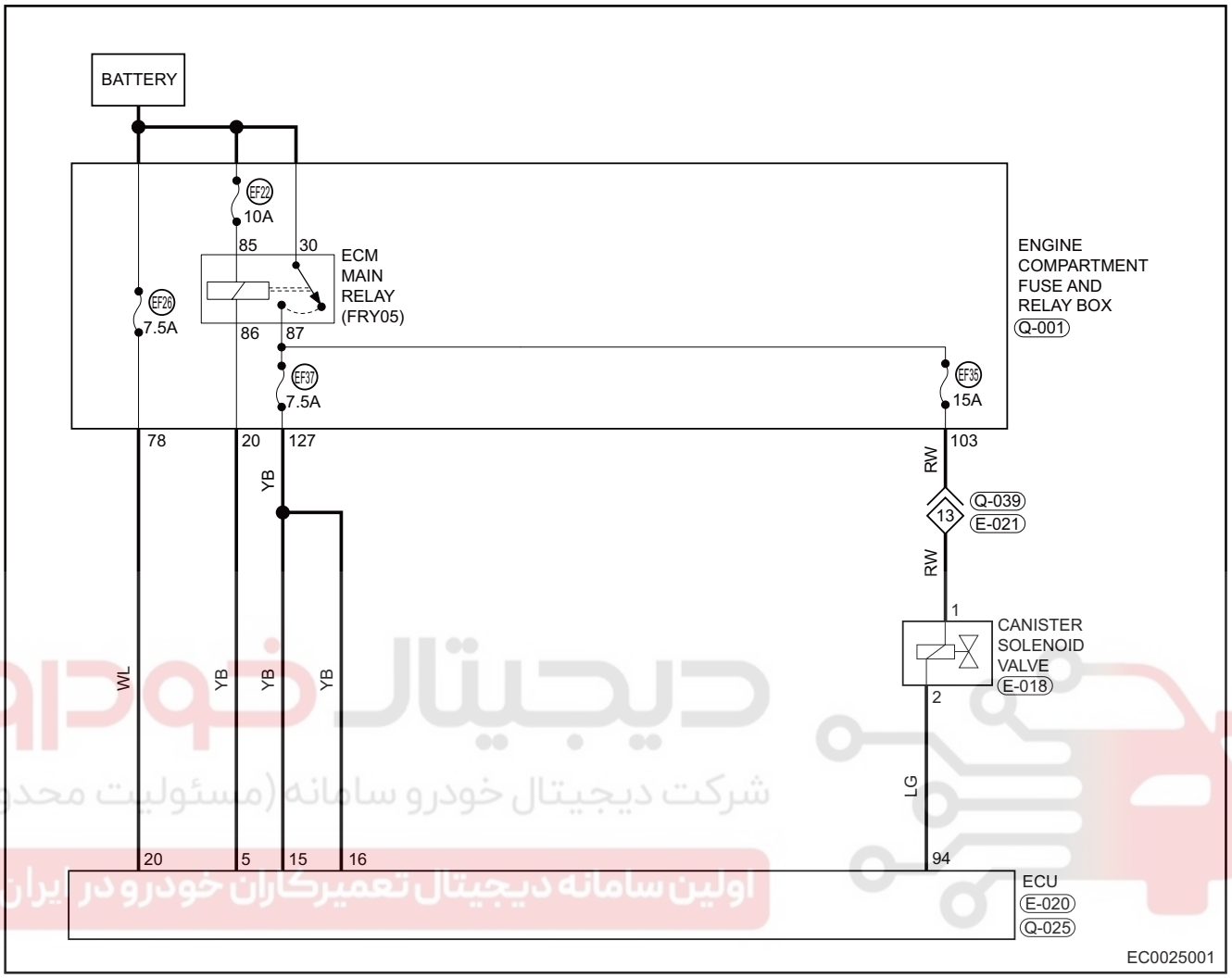
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.
- Before removal, mark the fuel vapor pipe II assembly and activated charcoal canister breather pipe to avoid confusion.

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 charcoal canister solenoid valve.
   (a) Disconnect the charcoal canister solenoid valve connector (arrow)



   (b) Loosen the elastic clamp (1) and disconnect the connection between charcoal canister solenoid valve assembly and its air outlet pipe assembly.
   (c) Loosen the elastic clamp (2) and disconnect the connection between charcoal canister solenoid valve assembly and fuel vapor pipe assembly.
   (d) Remove the charcoal canister solenoid valve assembly from water outlet pipe set.

Charcoal Canister Solenoid Valve Circuit Diagram



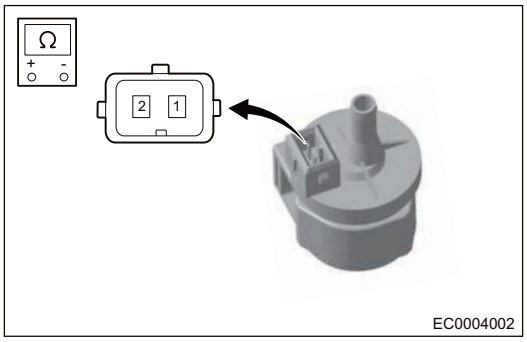
Inspection

1. Inspect the resistance of ignition coil primary winding.

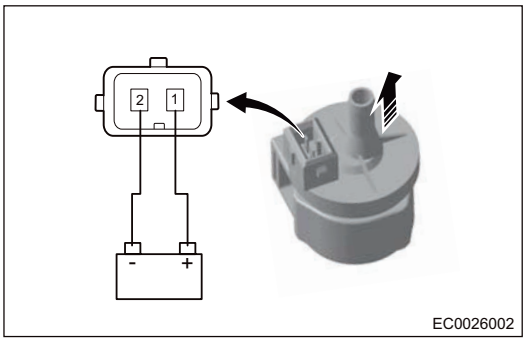
   (a) Measure the resistance between 2 terminals of charcoal canister solenoid valve with a digital multimeter.

Measurement Temperature	Specification (Ω)
20°C	26 ± 4

Hint:
If resistance is not as specified, replace the charcoal canister solenoid valve assembly.



2. Check if the charcoal canister solenoid valve opens normally and is blocked.
   (a) Connect the positive battery (+) to charcoal canister solenoid valve pin (1) and connect the negative battery (-) to charcoal canister solenoid valve pin (2). Check if the canister solenoid valve opens. After it opened, bleed air into direction of charcoal canister solenoid valve (arrow), and air flows easily.



Installation

1. Installation is in the reverse order of removal.
   Caution:
   - Positioning distance from hose end to elastic clamp is 3 to 5 mm.

Activated Charcoal Canister Assembly and Filter

Removal

Warning/Caution/Hint

Caution:

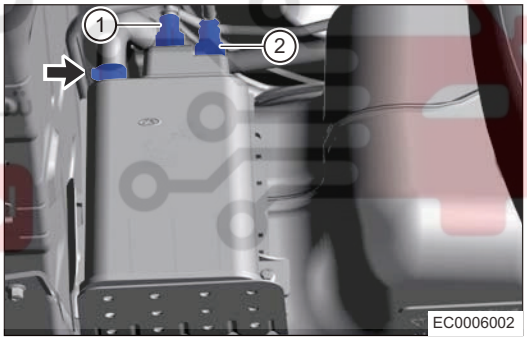
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.
- Before removal, mark the fuel vapor hose II, fuel vapor hose I and charcoal canister breather pipe to avoid confusion.

1. Turn off all electrical equipment and the ignition switch. Wait until engine cools down
2. Disconnect the negative battery cable.
3. Remove the activated charcoal canister assembly.

(a) Remove the coupling bolts (arrow) between activated charcoal canister assembly and mounting bracket.

Tightening torque
7 ± 1 N·m

(b) Loosen the elastic clamp (arrow), and disconnect the connection between activated charcoal canister assembly and breather hose.



(c) Disconnect the connection between activated charcoal canister assembly and fuel vapor pipe I (1) and fuel vapor pipe II (2).

(d) Remove the activated charcoal canister assembly.

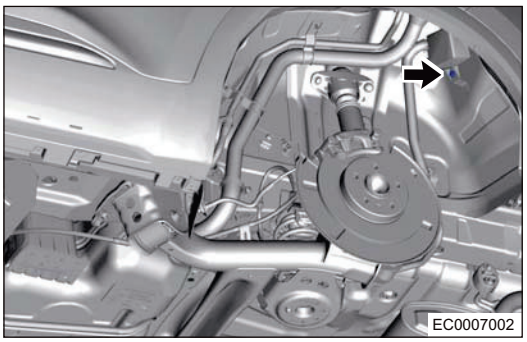
4. Remove the activated charcoal canister mounting bracket.

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

Tightening torque
7 ± 1 N·m

(b) Remove the charcoal canister mounting bracket.

5. Remove the activated charcoal canister filter.
   (a) Remove the rear left tire.
   (b) Remove the rear left wheel house protector.
   (c) Remove the fixing bolt from activated charcoal canister filter.
   Tightening torque
   7 ± 1 N·m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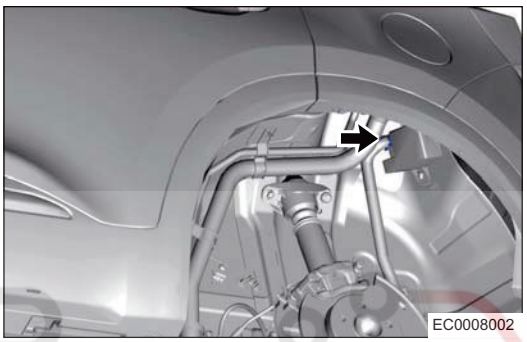
   (d) Loosen the elastic clamp (arrow), and disconnect the connection between filter and breather hose.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   (e) Remove the activated charcoal canister filter assembly.
   Caution:
   • Unneeded activated charcoal canister assembly should be handled by the specialized department according to local laws and regulations. Never discard it at will.

Installation

Warning/Caution/Hint

Caution:

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

1. Installation is in the reverse order of removal.

PCV Valve

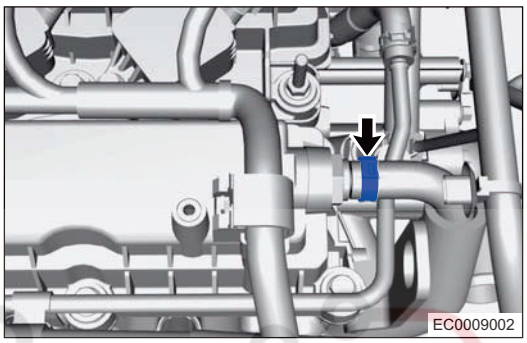
Removal

Warning/Caution/Hint

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 muffler assembly (See page 10-9).
5. Remove the PCV valve.
   (a) Loosen clamping ring (arrow) and disconnect connection between crankcase ventilation hose and PCV valve.

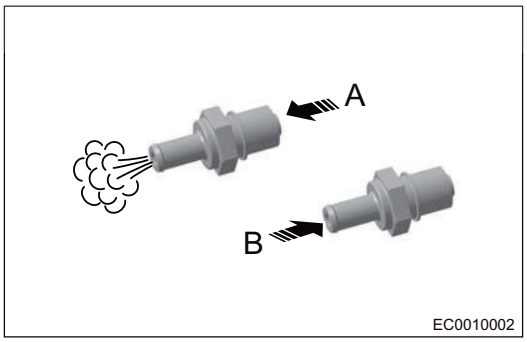


   (b) Loosen and remove the PCV valve from cylinder head cover.
   Tightening torque
   4 ± 1 N·m

Inspection

1. Install a clean hose to PCV valve.
2. Check the PCV valve operation.
   (a) Bleed air into the cylinder head cover side, and check that air A flows easily.
   (b) Blow air into the intake manifold side, and check that air B flows difficultly.
   Hint:
   - If result is not as specified, replace PCV valve.

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



3. Remove the clean hose from PCV valve.

Installation

Warning/Caution/Hint

Caution:

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

1. Installation is in the reverse order of removal.

Upstream Oxygen Sensor

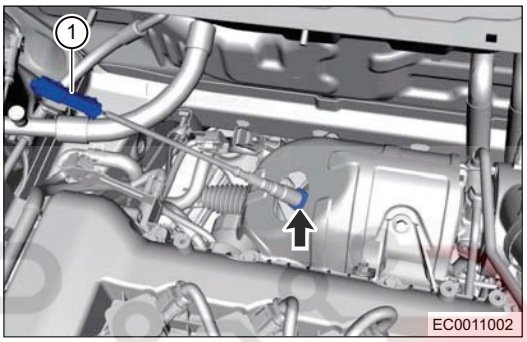
Removal

Warning/Caution/Hint

Caution:

- 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) Disconnect the upstream oxygen sensor connector (1).



   (b) Remove the upstream oxygen sensor (arrow) from tip of precatalytic converter.

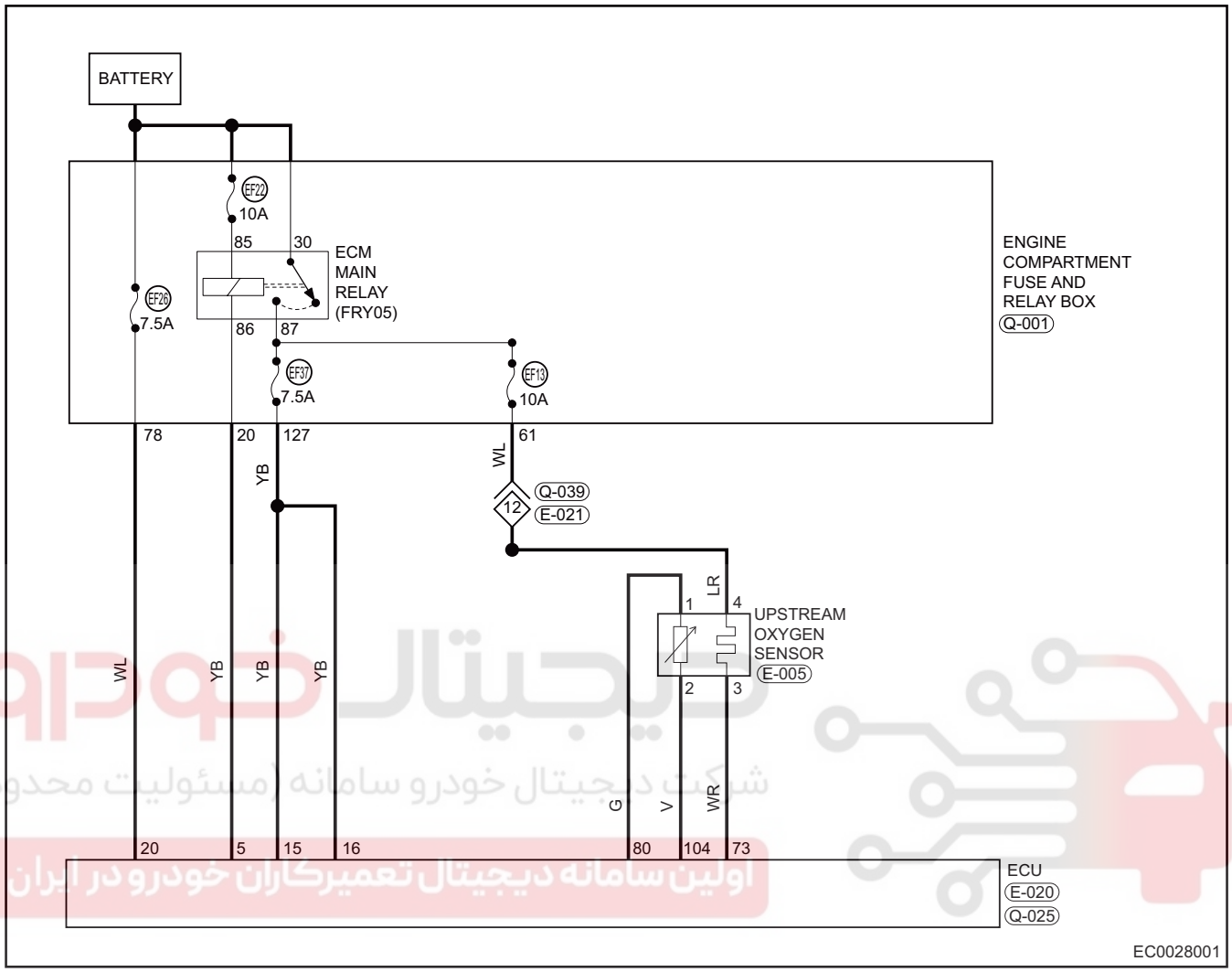
Hint:

Remove it with special tool oxygen sensor socket.

Tightening torque

45 ± 5 N·m

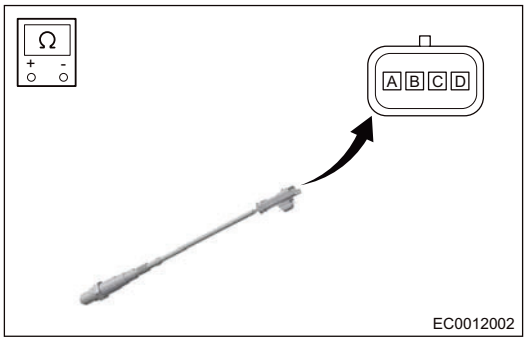
Upstream Oxygen Sensor Circuit Diagram



Inspection

1. Check the upstream oxygen sensor.

   (a) Measure the resistance of upstream oxygen sensor with a digital multimeter.



Multimeter Connection	Specified Condition
Terminal 1	Ground
Terminal 2	Signal
Terminal 3	Heat Control
Terminal 4	Power Supply

Multimeter Connection	Condition	Specified Condition
Terminal 3 - Terminal 4	20°C	5 - 22 Ω
Terminal 1 - Terminal 2 Terminal 1 - Terminal 4 Terminal 2 - Terminal 3 Terminal 2 - Terminal 4	Always	No continuity

Hint:
- If result is not as specified, replace the upstream oxygen sensor.

Installation

1. Installation is in the reverse order of removal.

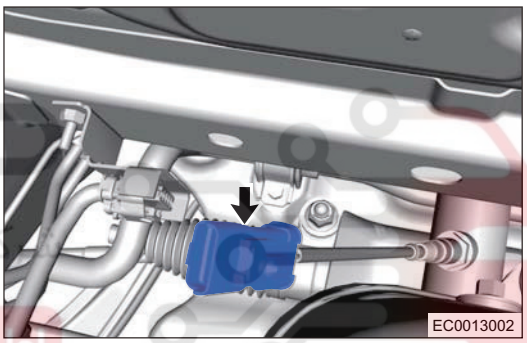
Downstream Oxygen Sensor

Warning/Caution/Hint

Caution:
- 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.

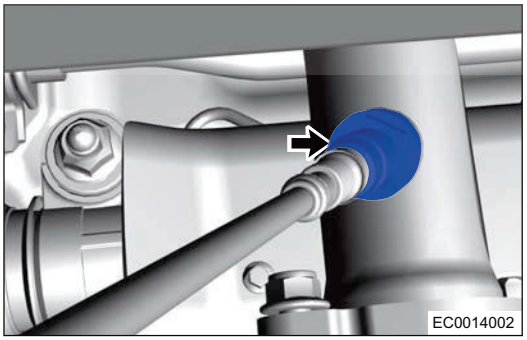
(a) Take off and disconnect the downstream oxygen sensor connector (arrow) from bracket.



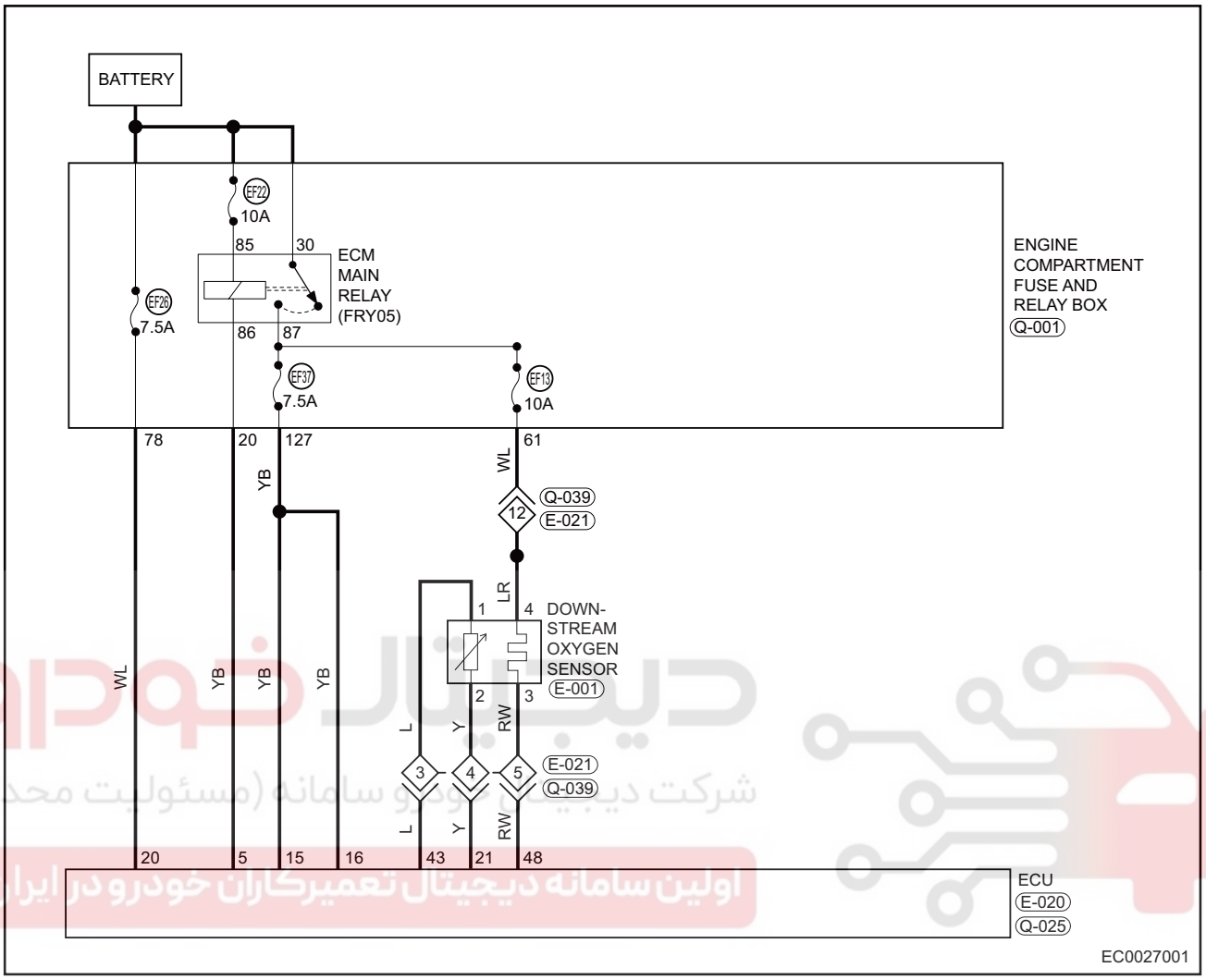
(b) Raise the vehicle to a proper position.

(c) Remove downstream oxygen sensor (arrow) from front exhaust pipe assembly.
Hint:
Remove it with special tool oxygen sensor socket.

Tightening torque
45 ± 5 N·m



Downstream Oxygen Sensor Circuit Diagram



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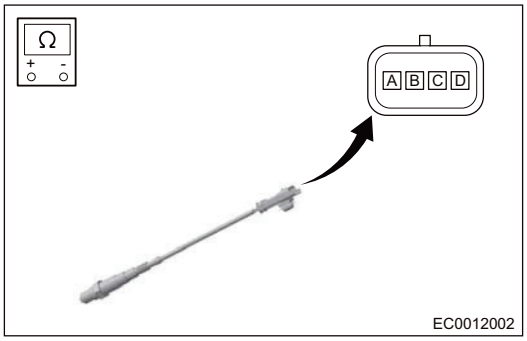
Inspection

1. Check the downstream oxygen sensor.

   (a) Measure the resistance of downstream oxygen sensor with a digital multimeter.



Multimeter Connection	Specified Condition
Terminal 1	Ground
Terminal 2	Signal
Terminal 3	Heat Control
Terminal 4	Power Supply

Multimeter Connection	Condition	Specified Condition
Terminal 3 - Terminal 4	20°C	5 - 22 Ω
Terminal 1 - Terminal 2 Terminal 1 - Terminal 4 Terminal 2 - Terminal 3 Terminal 2 - Terminal 4	Always	No continuity

Hint:

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

Installation

1. Installation is in the reverse order of removal.

SQRE4T15B INTAKE SYSTEM

GENERAL INFORMATION

Overview

Components

Description

1 - Intake Hose	2 - Turbocharger
3 - Muffler Assembly	4 - Muffler Hose
5 - Electronic Throttle Assembly	6 - Intake Pressure/Temperature Sensor
7 - Intake Manifold Gasket	8 - Intake Manifold Assembly
9 - Intercooler Gasket	10 - Intercooler Assembly
11 - Air Direct Pipe Assembly	12 - Air Filter Lower Housing
13 - Air Filter Element Assembly	14 - Air Filter Upper Housing

Intake system mainly consists of air direct pipe, air filter assembly, intake hose, turbocharger, booster pressure/temperature sensor, electronic throttle assembly, intake pressure/temperature sensor, and intake manifold with intercooler set, etc.

Operation

Intake system uses air filter to remove particulates and dust in the air. The filtered air is boosted through turbocharger and then flows into intake manifold assembly through electronic throttle assembly. And at the same time, cooling the air with the intercooler built in intake manifold. Then mixes with fuel at the end of intake manifold assembly port to form flammable gas mixture, which is transmitted to each cylinder uniformly to coordinate with engine operation. Electronic throttle assembly is a critical part for engine intake system. Its main function is to control intake air volume by adjusting intake passage area according to driver's driving intention to meet intake requirements in different engine operating conditions, and send back position signals of throttle valve plate to control unit to achieve accurate control and run the engine under optimal control state.

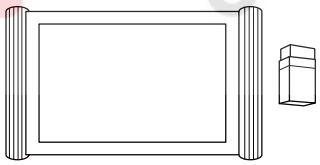
Specifications

Torque Specifications

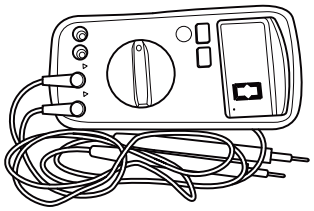
Description	Torque (N·m)
Coupling Screw Between Air Filter Upper Housing and Lower Housing	1.3 ± 0.2
Air Filter Assembly Fixing Bolt	7 ± 1
Air Direct Pipe Fixing Bolt	7 ± 1
Electronic Throttle Assembly Fixing Bolt	8 + 3
Electronic Accelerator Pedal Fixing Bolt	9 ± 1.5
Muffler Assembly Fixing Bolt	9 ± 1.5
Low Temperature Radiator Assembly Fixing Bolt	5 ± 1
Intake Manifold Fixing Bolt	20 + 5
Water Inlet Pipe Fixing Bolt	5 ± 1

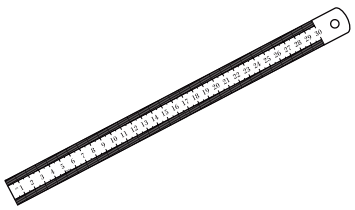
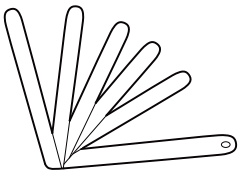
Tools

Special Tool

X-431 PAD Diagnostic Tester	 001

General Tools

Digital Multimeter	 002

Precision Straightedge	 063
Feeler Gauge	 060

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	Possible Cause
Engine idles roughly	Electronic throttle assembly (dirty)
	Intake manifold assembly (broken, leaked)
	Activated charcoal canister solenoid valve (remains on)
	Intake Pressure/Temperature Sensor
	Throttle gasket (damaged)
	Fuel rail injector assembly (installed incorrectly)

ON-VEHICLE SERVICE

Air Filter Element

Replacement

Warning/Caution/Hint

Caution:

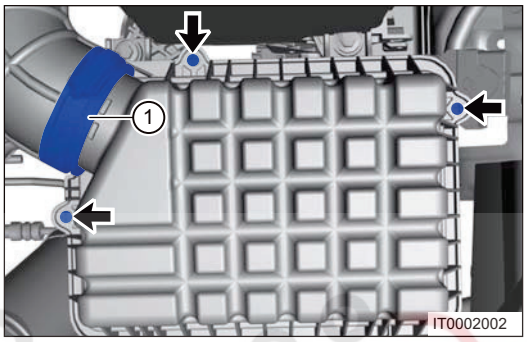
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the air filter element.

(a) Remove 3 coupling screws (arrow) between air filter upper housing and lower housing.

Tightening torque

1.3 ± 0.2 N·m



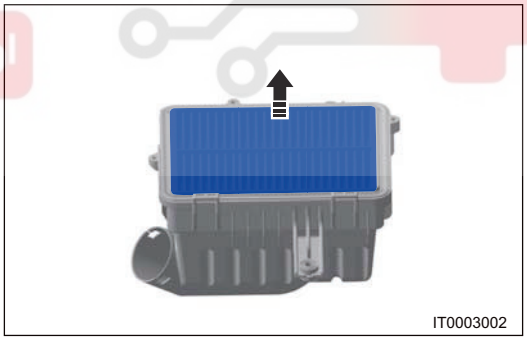
(b) Loosen worm clamp (1) and disconnect connection between air filter and intake hose.

Tightening torque

3 ± 0.5 N·m

(c) Remove the air filter upper housing.

(d) Remove the air filter element in the direction of (arrow).



Installation

1. Clean the air filter upper housing and lower housing.
2. Install a new air filter element.
3. Other installation procedures are in the reverse order of removal.

Warning:

- Wasted air filter element should be handled by the specialized department according to local laws and regulations. Never discard it at will.

Air Filter Assembly

Removal

Warning/Caution/Hint

Caution:

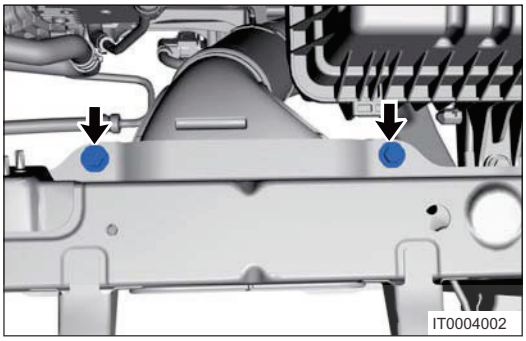
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch. Wait until engine cools down.
2. Disconnect the negative battery cable.
3. Remove the air direct pipe assembly.

   (a) Remove 2 fixing bolts (arrow) from air direct pipe.

   Tightening torque

   7 ± 1 N·m

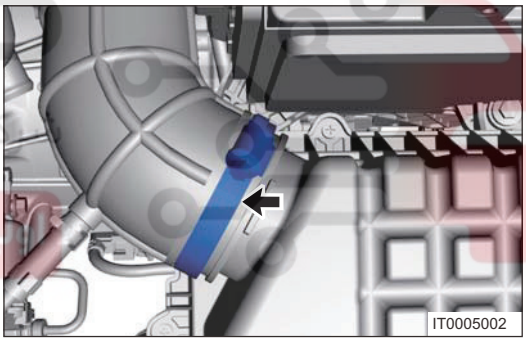


4. Remove the air filter assembly.

   (a) Loosen worm clamp (arrow) and disconnect connection between air filter and intake hose.

   Tightening torque

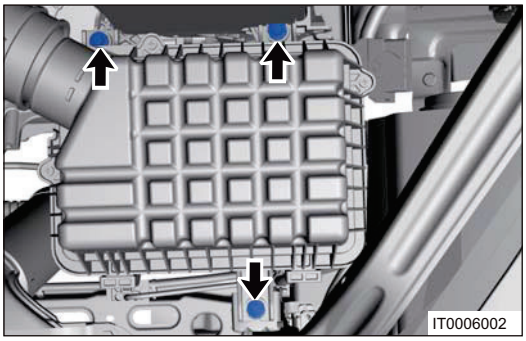
   3 ± 0.5 N·m



   (b) Remove 3 fixing bolts (arrow) from air filter.

   Tightening torque

   7 ± 1 N·m



   (c) Remove the air filter assembly.

   Caution:

   - After removing air filter assembly, block intake hose with suitable blocking pieces to prevent foreign matter from entering, causing damage to the components.

Installation

1. Installation is in the reverse order of removal.

   Caution:

   - Check for foreign matter in air filter and hose when installing. Avoid inhaling foreign matter after engine running, causing damage to the components.

Muffler and Muffler Hose

Removal

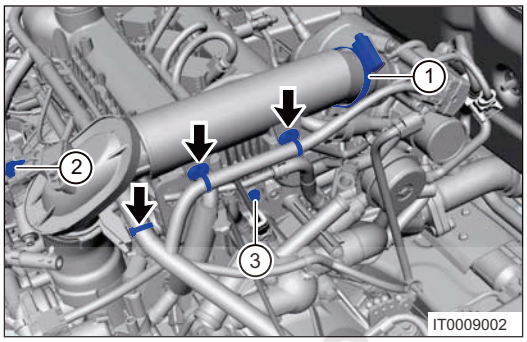
Warning/Caution/Hint

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 intake hose assembly.
4. Remove the muffler assembly.

(a) Remove fixing clips (arrow) from engine wire harness and muffler assembly.



(b) Loosen worm clamp (1) and disconnect connection between muffler assembly and turbocharger.

Tightening torque

5 ± 1 N·m

(c) Disconnect the boost pressure/temperature sensor connector (2).

(d) Remove the muffler assembly fixing bolt (3).

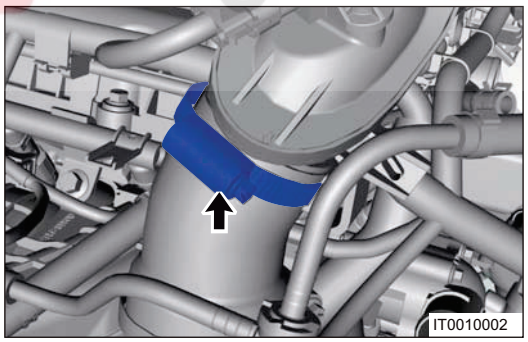
Tightening torque

9 ± 1.5 N·m

(e) Loosen worm clamp (arrow) and disconnect connection between muffler assembly and muffler hose.

Tightening torque

5 ± 1 N·m



(f) Remove the muffler assembly.

Caution:

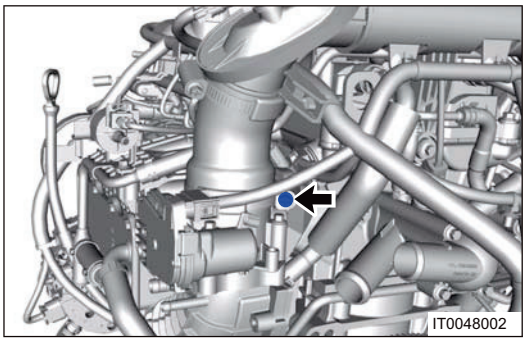
- After removing muffler assembly, block turbocharger outlet side with suitable blocking pieces to prevent foreign matter from entering, causing damage to the components.

5. Remove the muffler hose.

   (a) Loosen worm clamp (arrow) and disconnect connection between muffler hose and throttle assembly.

   Tightening torque
   3 ± 0.5 N·m

   Caution:
   - After removing muffler hose assembly, block throttle with suitable blocking pieces to prevent foreign matter from entering, causing damage to the components.



Installation

1. Installation is in the reverse order of removal.

   Caution:
   - Check for foreign matter in muffler and hose when installing. Avoid inhaling foreign matter after engine running, causing damage to the components.

Low Temperature Radiator

Removal

Warning/Caution/Hint

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.

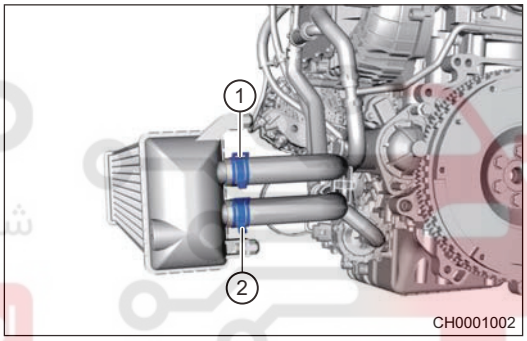
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove and install the tank lower protector.
4. Remove the front bumper assembly.

   Caution:

   - Prevent scratches or damage to front bumper during removal.
5. Remove the front bumper guard beams assembly (See page 48-6).
6. Remove the left/right air deflector.
7. Remove the low temperature radiator assembly.

   (a) It is necessary to drain the coolant from intercooler system before removing low temperature radiator (See COOLING SYSTEM).

   (b) Loosen elastic clamp (1) and disconnect connection between low temperature radiator water inlet pipe and low temperature radiator assembly.

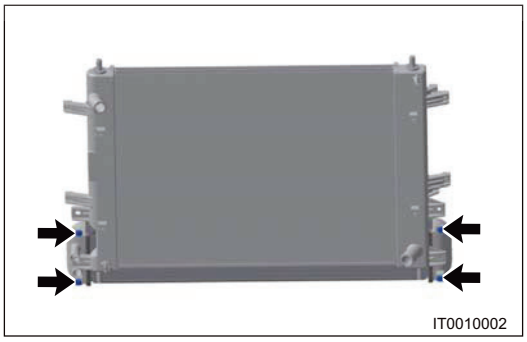


   (c) Loosen the elastic clamp (2). Disconnect connection between low temperature radiator water outlet pipe and low temperature radiator assembly.

   (d) Remove 4 fixing bolts from low temperature radiator assembly.

   Tightening torque

   5 ± 1 N·m



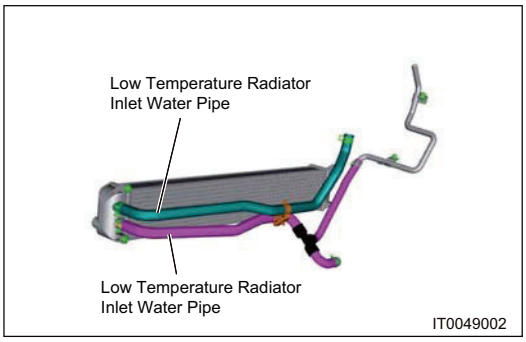
   (e) Take out the low temperature radiator assembly, position it in place and put unqualified mark.

Installation

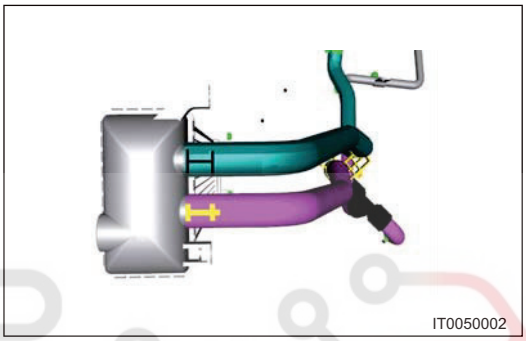
1. Installation is in the reverse order of removal.

Caution:

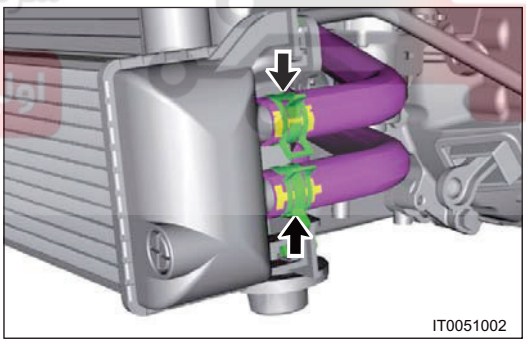
- There are no crossed or twisted conditions occur and never install water inlet pipe and water outlet pipe reversed when installing them. Make sure that elastic clamp is clamped in place with clamp pliers.



  - There is " 工 " mark at port of water inlet pipe, and connected with low temperature radiator upper interface.



  - There is " 土 " mark at port of water outlet pipe, and connected with low temperature radiator lower interface.
- When installing low temperature radiator water inlet pipe, align the " 工 " mark at port with boss and align center position of elastic clamp tabs with " — " position of " 工 " mark. Elastic clamp is clamped in " 工 " mark range, tabs face towards outside and put marks with marking pen.



- When installing low temperature radiator water outlet pipe, align center position of elastic clamp tabs with center position of " 土 " mark. Elastic clamp is clamped in " 土 " mark range, tabs face towards outside .
- Pay attention to the connection principle of "Insert, Extract and Confirm" when installing front bumper assembly. And adjust the match between front bumper & headlight and fender.
- Add the coolant and perform bleeding of intercooler system (Refer to Cooling System Chapter).
- After assembly is completed, it is necessary to check relevant function items and clean engine compartment.

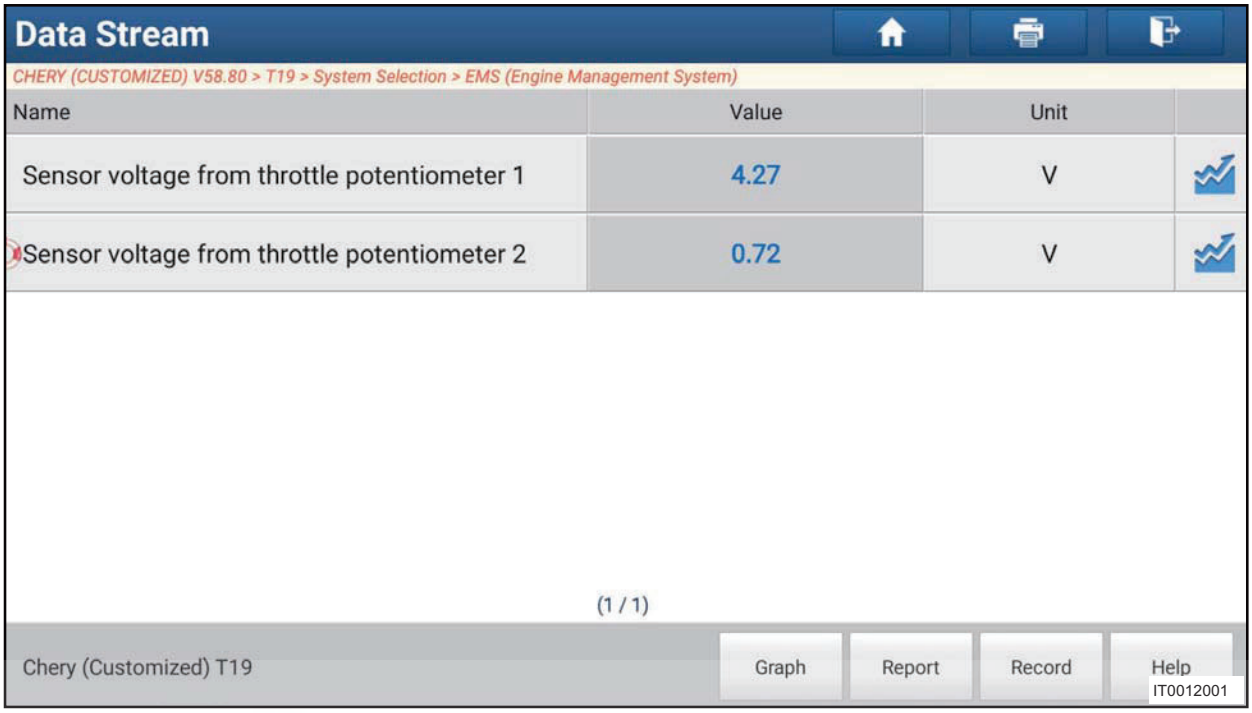
Electric Throttle Assembly

On-vehicle Inspection

1. Check the electronic throttle assembly.
   (a) When flipping it by hand with power off and it can rotate smoothly. If catching occurs, it indicates that internal components may be damaged, and replace the electronic throttle assembly.
   (b) Connect the diagnostic tester to diagnostic interface.
   (c) Turn ignition switch to ON and turn on the diagnostic tester.
   (d) Read datastream on diagnostic tester.
   Hint:
   Accelerator pedal released

Datastream Name	Specification (V)
Sensor voltage from throttle potentiometer 1	0.76
Sensor voltage from throttle potentiometer 2	4.24

Hint:
Accelerator pedal depressed fully



Datastream Name	Specification (V)
Sensor voltage from throttle potentiometer 1	4.27
Sensor voltage from throttle potentiometer 2	0.72

If result is not as specified, check wire harness, ECM, or replace electronic throttle assembly.

Removal

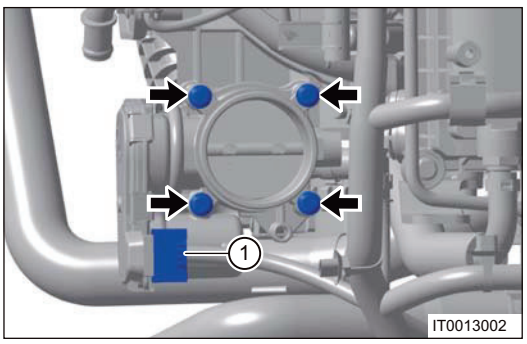
Warning/Caution/Hint

Caution:

- Temperature in engine compartment is very high when engine is running. Before removal, you must make sure that engine has shut off, and engine compartment 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 muffler and muffler hose
5. Remove the electronic throttle assembly.

   (a) Disconnect the electronic throttle connector (1).



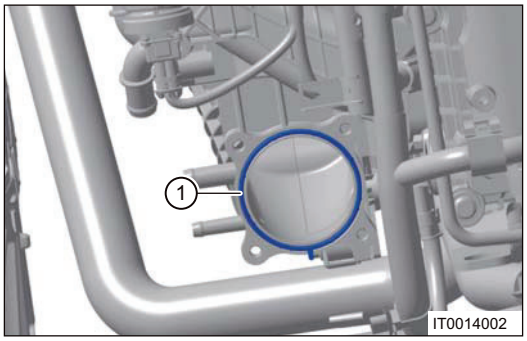
(b) Remove 4 fixing bolts (arrow) from electronic throttle.

Tightening torque
8 + 3 N·m

(c) Remove the electronic throttle assembly.

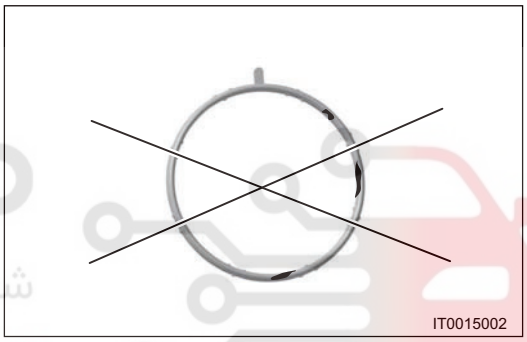
(d) Remove throttle gasket (1) from intake manifold.

Caution:
- After removing throttle assembly, block intake manifold intake port with suitable blocking pieces to prevent foreign matter from entering, causing damage to the components.

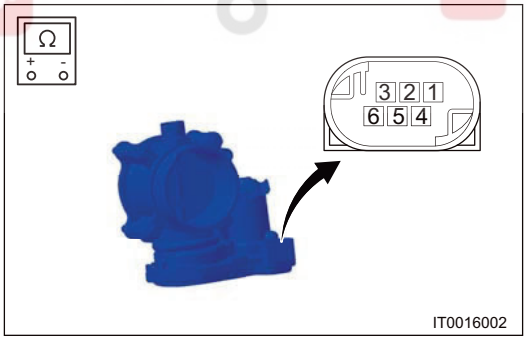


Inspection

1. Check the electronic throttle assembly gasket.
   (a) Check electronic throttle assembly gasket for wear or deterioration. If there is wear or deterioration, replace electronic throttle assembly gasket.



2. Check the electronic throttle assembly.
   (a) Measure resistance of electronic throttle assembly according to the right table.

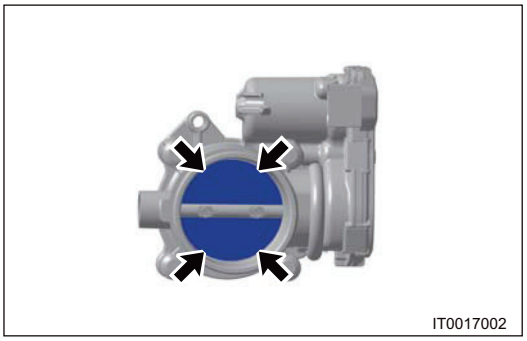


Multimeter Connection	Standard Condition
Terminal 2 - Terminal 3	1.067 kΩ (resistance at ambient temperature)
Terminal 6 - Terminal 2 Terminal 6 - Terminal 3	As throttle opens, resistance between terminals 6 and 2 increases. And resistance between terminals 6 and 3 decreases.
Terminal 5 - Terminal 2 Terminal 5 - Terminal 3	As throttle opens, resistance between terminals 5 and 2 decreases. And resistance between terminals 5 and 3 increases.

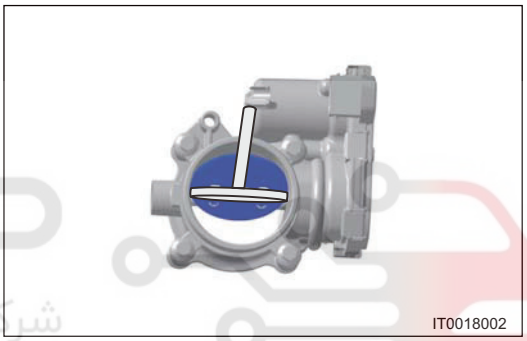
Cleaning

1. Cleaning Tool
   (a) Thin stick: used to support throttle valve plate for cleaning the carbon deposited on contact wall between valve plate and throttle. Please use plastic, wooden or bamboo thin stick. Do not use metal thin stick to avoid scratching or deforming the valve plate.
   (b) Clean cloth or paper towel.

2. Cleaning Process
   (a) Remove electronic throttle assembly, and make the valve plate face upward in free condition. Avoid cleaner flowing into electronic element through valve plate shaft, resulting in functional failure.
   (b) Start to clean when it is as shown in the right illustration.


IT0017002

   (c) Apply appropriate amount of cleaner to the inner wall of throttle valve body, and wipe off the carbon with clean cloth.
   (d) Support the throttle valve plate with a thin stick, and clean the carbon on valve plate and throttle valve body inner wall.


IT0018002

   (e) Turn over the throttle 180°, and clean with the same procedures as above. Repeat several times until it is clean.
   (f) Push the valve plate by hand, and check if it rotates smoothly. If it is stuck, clean again according to the cleaning procedures.
   (g) After cleaning, wipe off the cleaner in throttle valve body with absorbent paper.
   Warning:
   - Cleaner is a kind of flammable and corrosive fluid. Follow safety cautions to prevent accidents, and avoid skin contacting with cleaner.
   - Pay attention to that the amount of cleaner should not be too much, so as to overflows into sensor and motor, resulting in functional failure.

Installation

Warning/Caution/Hint
Caution:
- Clean fitting surface of electronic throttle assembly.
- Perform throttle self-learning procedures after installation. After self-learning is completed, start the vehicle and check for proper operation.

1. Installation is in the reverse order of removal.

Intake Manifold Assembly

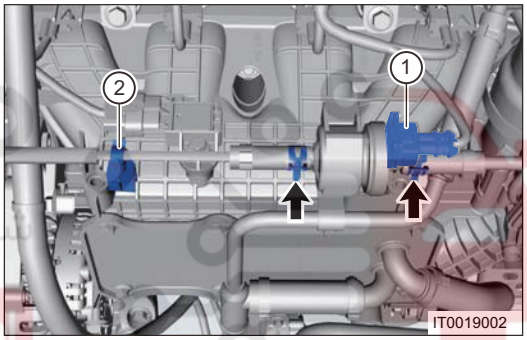
Removal

Warning/Caution/Hint

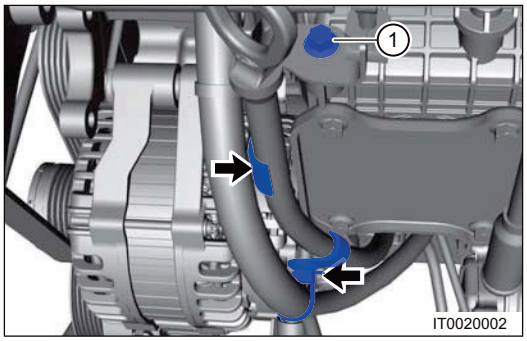
Caution:

- Temperature in engine compartment is very high when engine is running. Before removal, you must make sure that engine has shut off, and engine compartment 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. Fuel System Pressure Release
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative battery cable.
4. Remove the engine trim cover.
5. Remove the fuel rail injector assembly.
6. Remove the muffler and muffler hose
7. Remove the electronic throttle assembly.
8. Remove the charcoal canister solenoid valve assembly.
   (a) Disconnect the charcoal canister solenoid valve connector (1).

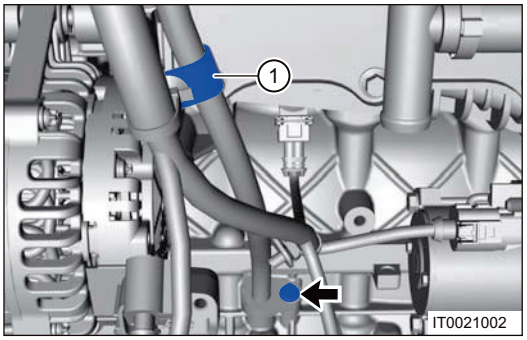


   (b) Loosen 2 elastic clamps (arrow) and disconnect connection between fuel vapor hose and charcoal canister solenoid valve.
   (c) Remove fuel vapor hose from fixing tube clamp (2).
   (d) Remove the charcoal canister solenoid valve assembly.
9. Remove the oil dipstick guide assembly.
   (a) Disconnect the engine wire harness fixing clip (arrow).



   (b) Remove coupling bolt (1) between oil dipstick guide and intake manifold assembly.
   Tightening torque
   8 + 3 N·m

(c) Disconnect the engine wire harness fixing clip (1).



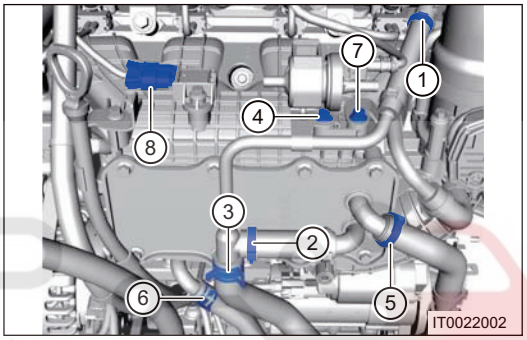
(d) Remove coupling bolt (arrow) between oil dipstick guide and cylinder block frame assembly.

Tightening torque
8 + 3 N·m

(e) Remove the oil dipstick guide assembly.

10. Remove the intake manifold assembly.

(a) Loosen clamping ring (1) and disconnect connection between water outlet pipe set and intercooler water outlet pipe set.



(b) Loosen clamping ring (2) and disconnect connection between intercooler water outlet pipe set and intercooler assembly.

(c) Loosen elastic clamp (3) and disconnect connection between intercooler water outlet pipe set and low temperature radiator water inlet pipe set.

(d) Remove intercooler outlet pipe set fixing bolt (4), and remove intercooler outlet pipe set.

Tightening torque
8 + 3 N·m

(e) Loosen clamping ring (5) and disconnect connection between water inlet pipe set and intercooler assembly.

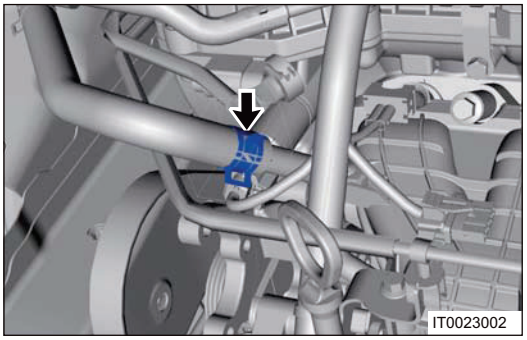
(f) Loosen elastic clamp (6) and disconnect connection between water inlet pipe and low temperature radiator water outlet pipe set.

(g) Remove fixing bolt (7) from brake vacuum pipe bracket.

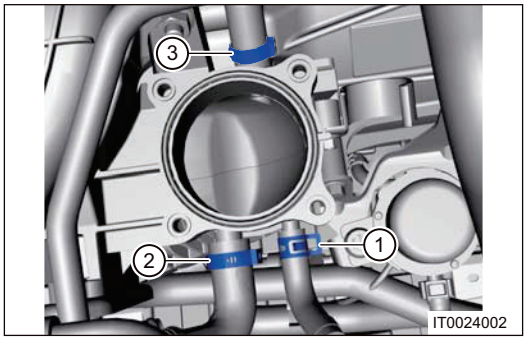
Tightening torque
8 + 3 N·m

(h) Disconnect the intake pressure/temperature sensor connector (8).

(i) Loosen elastic clamp (arrow) and disconnect connection between expansion tank water outlet pipe set and water inlet pipe.



(j) Loosen elastic clamp (1) and disconnect connection between fuel vapor outlet pipe set and intake manifold assembly.

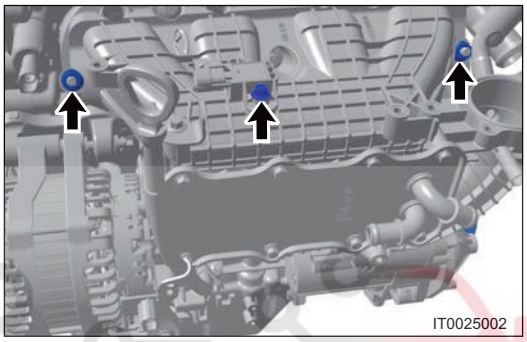


(k) Loosen elastic clamp (2) and disconnect connection between brake vacuum pipe and intake manifold assembly.

(l) Loosen clamping ring (3) and disconnect connection between crankcase ventilation tube and intake manifold assembly.

(m) Remove 3 fixing bolts (arrow) from intake manifold assembly.

Tightening torque
20 + 5 N·m



(n) Remove the intake manifold assembly.

Caution:
- After removing intake manifold assembly, block both ends of intake manifold and intake port of cylinder head with suitable blocking pieces to prevent foreign matter from entering, causing damage to the components.

11. Remove intake pressure/temperature sensor and water inlet pipe.

(a) Remove 2 fixing bolts (arrow) from water inlet pipe.

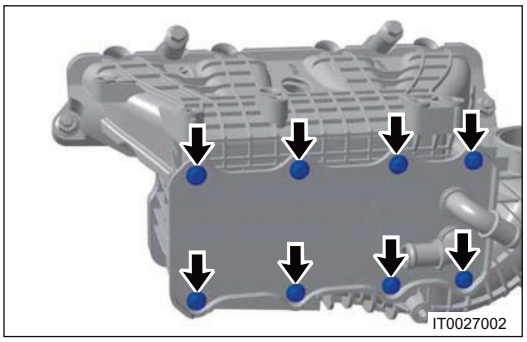
Tightening torque
5 ± 1 N·m

(b) Remove the intake pressure/temperature sensor fixing bolt (1).

Tightening torque
7 ± 1 N·m

(c) Remove intake pressure/temperature sensor and water inlet pipe.

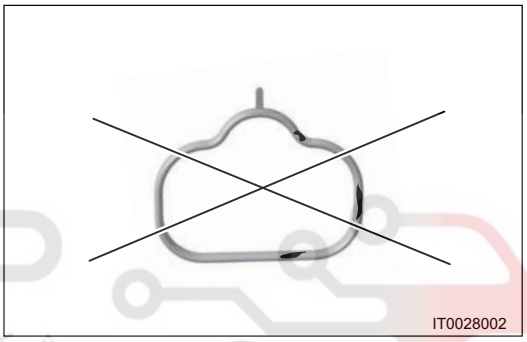
12. Remove the intercooler assembly.
    (a) Remove 6 intercooler fixing bolts (arrow).



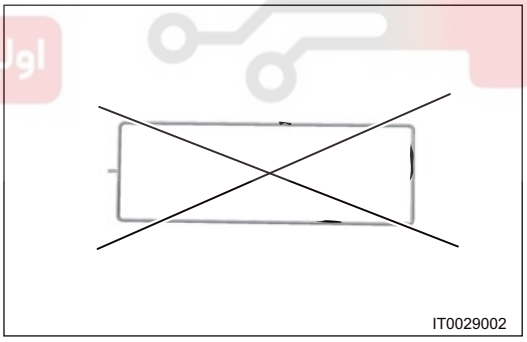
    (b) Remove intercooler assembly and gasket.

Inspection

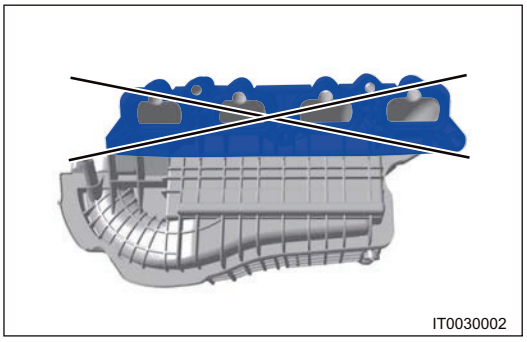
1. Check the intake manifold gasket.
    (a) Check the intake manifold gasket, and replace if it is deteriorated or damaged.



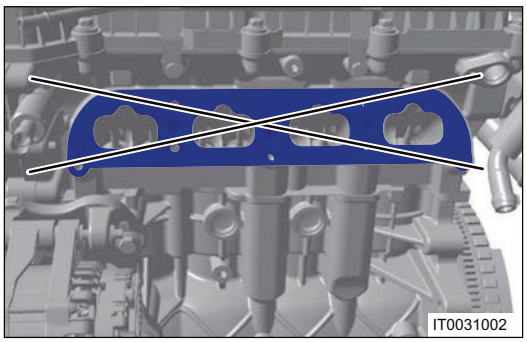
2. Check the intercooler gasket.
    (a) Check the intercooler gasket, and replace if it is deteriorated or damaged.



3. Check flatness on intake manifold fitting surface.
    (a) Clean and check contact surface between intake manifold assembly side and cylinder head.
    (b) Using a precision straightedge and feeler gauge, measure intake manifold flatness. If warpage on surface is greater than 0.8 mm, replace intake manifold assembly.



4. Check warpage on cylinder head surface on installation side of intake manifold.
   (a) Clean and check contact surface between intake manifold assembly and cylinder head side.
   (b) Using a precision straightedge and feeler gauge, measure warpage on cylinder head side surface. If warpage on surface is greater than 0.04 mm, replace cylinder head assembly.



Installation

Warning/Caution/Hint

Caution:

- Clean the fitting surface of intake manifold assembly.
- Replace the intake manifold gasket if it is damaged during installation.

1. Installation is in the reverse order of removal.

   Caution:

   - Check for foreign matter in intake manifold when installing. Avoid inhaling foreign matter after engine running, causing damage to the components.

Electronic Accelerator Pedal

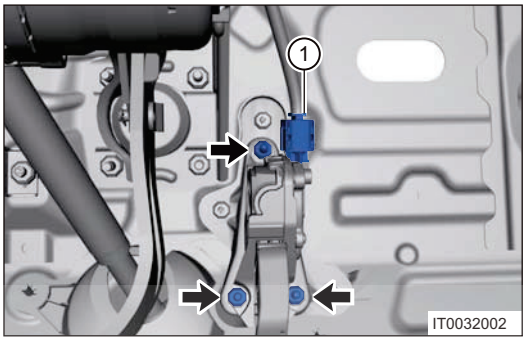
Removal

Warning/Caution/Hint

Caution:

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent interior 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 electronic accelerator pedal.
   (a) Disconnect the electronic accelerator pedal connector (1).



   (b) Remove 3 fixing nuts (arrow) from electronic accelerator pedal.

Tightening torque

9 ± 1.5 N·m

   (c) Remove the electronic accelerator pedal.

Installation

1. Installation is in the reverse order of removal.

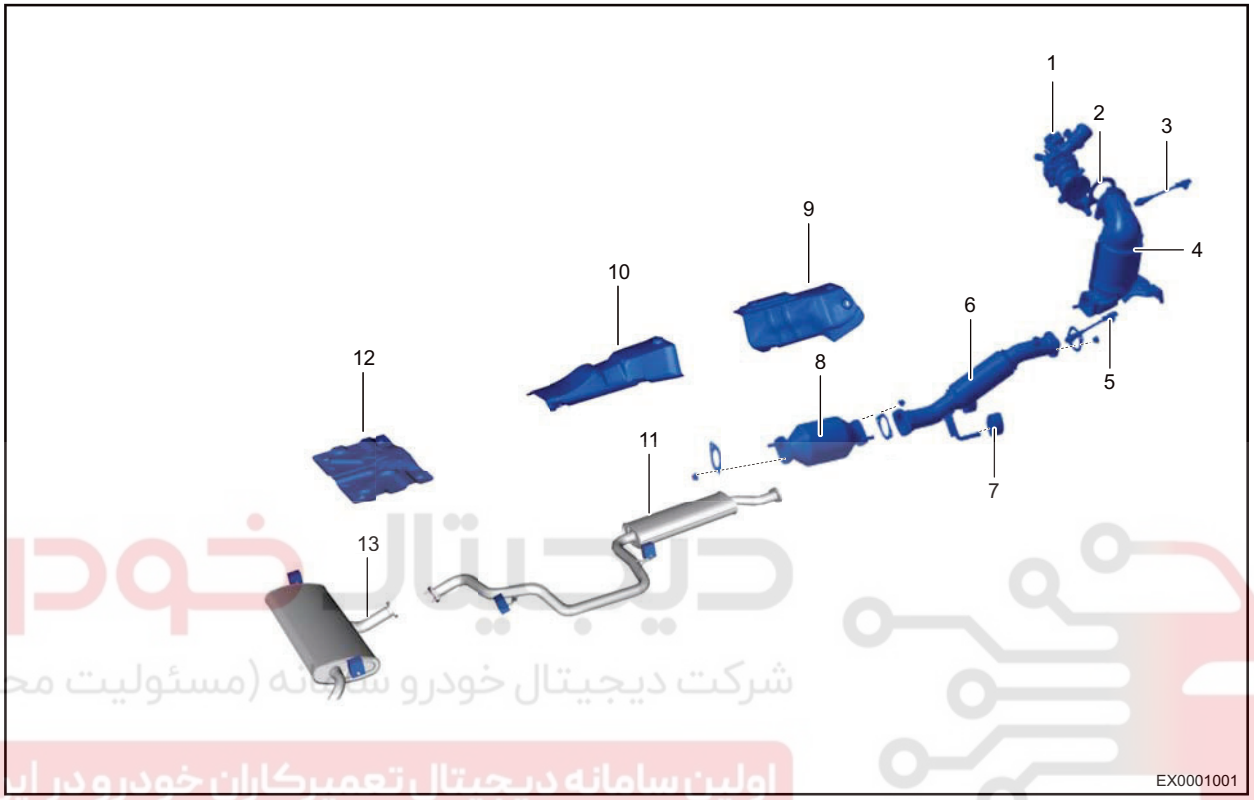
SQRE4T15B EXHAUST SYSTEM

GENERAL INFORMATION

Overview

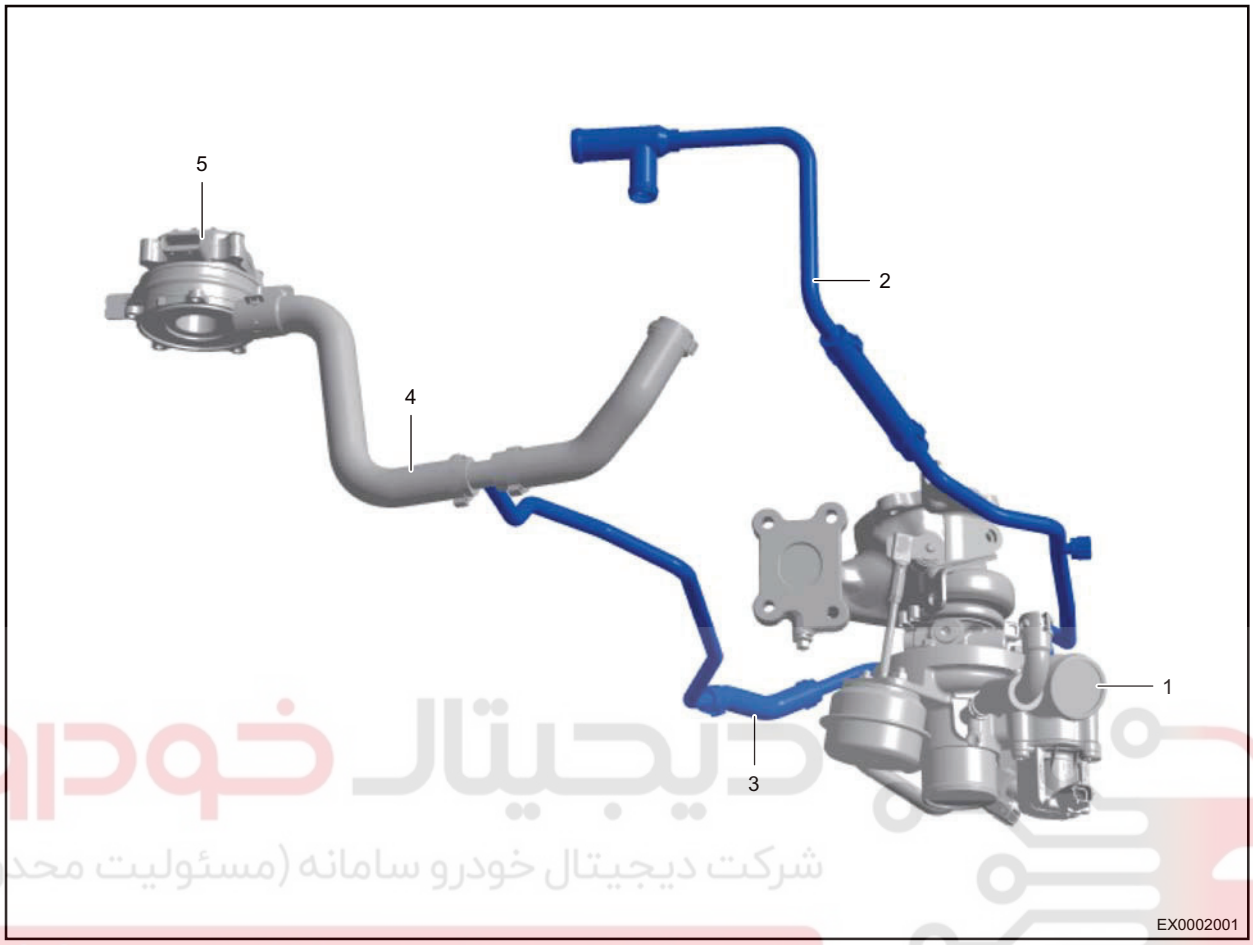
Components

Description



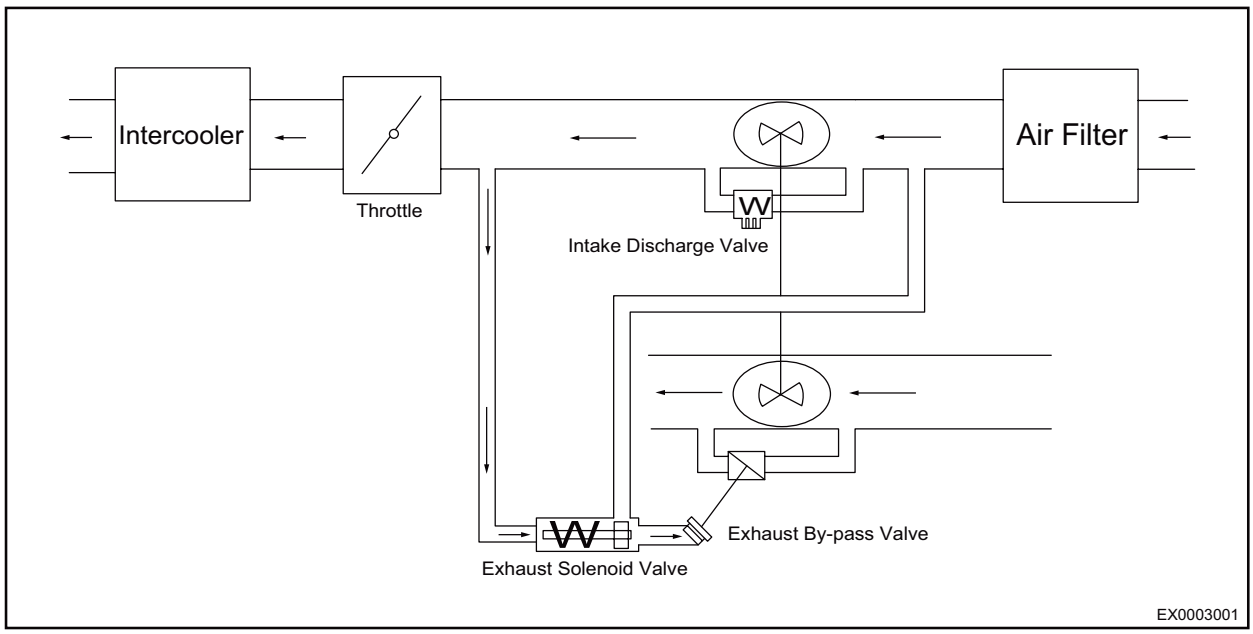
1 - Turbocharger Assembly	2 - Precatalytic Converter Mounting Gasket
3 - Upstream Oxygen Sensor	4 - Precatalytic Converter Assembly
5 - Downstream Oxygen Sensor	6 - Front Exhaust Pipe Assembly
7 - Diamond Shaped Hanger Block	8 - Main Catalytic Converter Assembly
9 - Muffler Heat Insulator II	10 - Muffler Heat Insulator III
11 - Front Muffler Assembly	12 - Muffler Heat Insulator I
13 - Rear Muffler Assembly	

Connection Between Turbocharger and Electric Water Pump



1 - Turbocharger Assembly	2 - Turbocharger Water Outlet Pipe Set
3 - Turbocharger Water Inlet Pipe Set	4 - Electric Water Pump Outlet Pipe
5 - Electric Water Pump Assembly	

Operation



Turbocharger use exhaust gas that is discharges during engine running to turn the turbo impeller, and then drive compressor impeller to send the air pressed through air filter into cylinder. As more air enters into cylinder, more fuel is allowed to be injected so that more engine power is generated. In addition, the turbocharger can also make the engine get power compensation when it works in highland.

Specifications

Torque Specifications

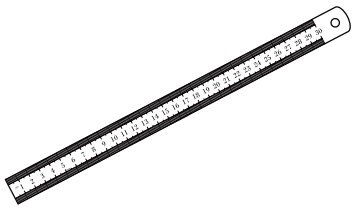
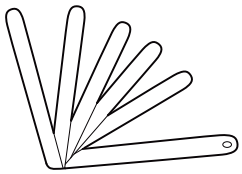
Description	Torque (N·m)
Precatalytic Converter Assembly Bracket Fixing Bolt	20 + 5
Upstream Oxygen Sensor	45 ± 5
Downstream Oxygen Sensor	45 ± 5
Coupling Bolt Between Precatalytic Converter Assembly and Front Exhaust Pipe Assembly	45 ± 5
Coupling Nut Between Precatalytic Converter Assembly and Turbocharger	33 ± 3 / 40 ± 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
Turbocharger Bracket Fixing Bolt	23 ± 3.5
Turbocharger Heat Insulator Fixing Bolt	9 ± 1.5
Turbocharger Heat Insulator II Fixing Bolt	8 + 3
Turbocharger Fixing Nut	25 ± 5
Exhaust By-pass Control Solenoid Valve Fixing Bolt	3 + 2
Electric Water Pump Assembly Fixing Bolt	8 + 3
Electric Water Pump Bracket Fixing Bolt	8 + 3
Hollow Bolt Torque	25 + 5

Non-reusable Part

Non-reusable Part	
High Temperature Nut (Turbocharger)	Replace it
Gasket - Turbocharger	Replace it
Gasket (Hollow Bolt)	Replace it
Fluid Return Pipe Gasket	Replace it

Tools

General Tools

Precision Straightedge	 063
Feeler Gauge	 060

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)
	Exhaust manifold assembly (damaged or leaked)
	Main catalytic converter assembly (damaged or leaked)
	Muffler assembly (damaged or leaked)
	Exhaust pipe gasket (damaged)
Excessive exhaust temperature	Exhaust manifold assembly (blocked)
	Main catalytic converter assembly (blocked)
	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)
	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.

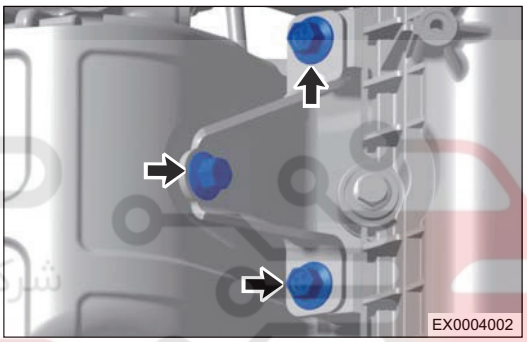
Caution:

- 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 the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the turbocharger fixing bracket.

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

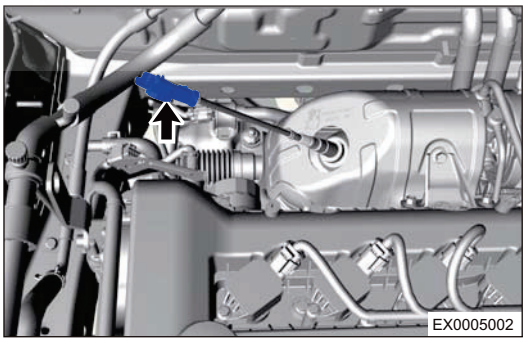
   Tightening torque
   23 ± 3.5 N·m



   (b) Remove the turbocharger fixing bracket.

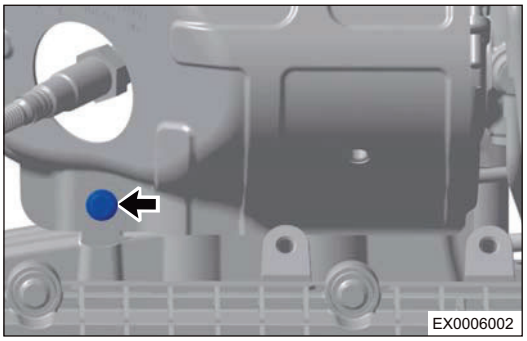
5. Remove the turbocharger heat insulator assembly.

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



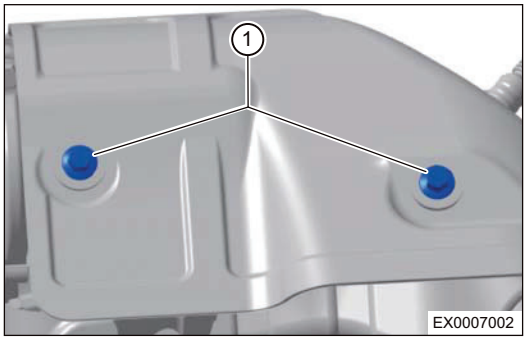
   (b) Remove the turbocharger heat insulator fixing bolt (arrow).

   Tightening torque
   9 ± 1.5 N·m



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

Tightening torque
9 ± 1.5 N·m

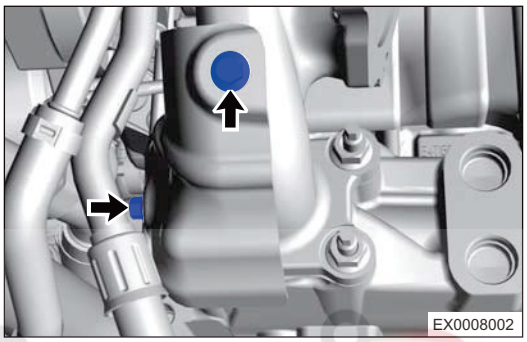


(d) Remove the turbocharger heat insulator assembly

6. Remove the turbocharger heat insulator Ⅱ .

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

Tightening torque
8 + 3 N·m



(b) Remove the turbocharger heat insulator Ⅱ .

Installation

1. Installation is in the reverse order of removal.

Turbocharger Assembly

Removal

Warning/Caution/Hint

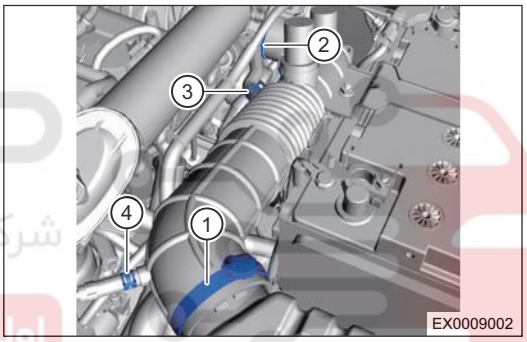
Warning:

- 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.

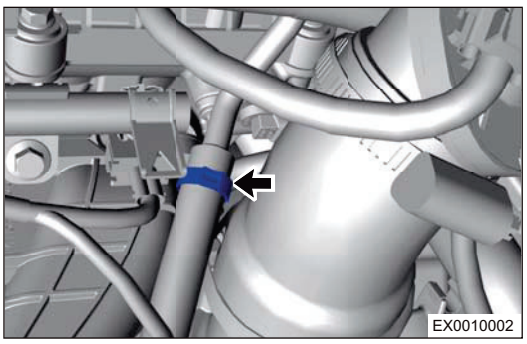
Caution:

- 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.

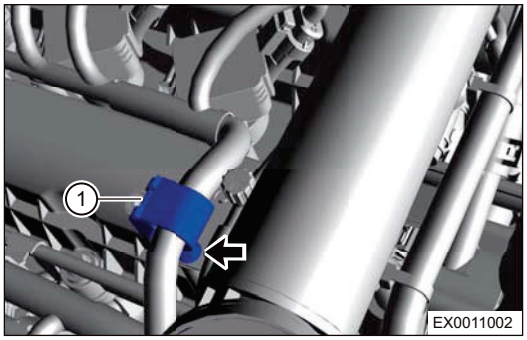
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Drain the coolant.
5. Remove the muffler assembly.
6. Remove the precatalytic converter assembly.
7. Remove the intake hose assembly.
   (a) Loosen worm clamp (1) and disconnect connection between intake hose and air filter assembly.



   (b) Loosen worm clamp (2) and disconnect connection between intake hose and turbocharger assembly.
   (c) Loosen elastic clamp (3) and disconnect connection between crankcase ventilation hose and intake hose.
   (d) Loosen elastic clamp (4) and disconnect connection between fuel vapour pipe set and intake hose.
   (e) Remove the intake hose assembly.
8. Remove the turbocharger water outlet pipe set assembly.
   (a) Loosen clamping ring (arrow) and disconnect connection between turbocharger water outlet pipe set and water outlet hose.

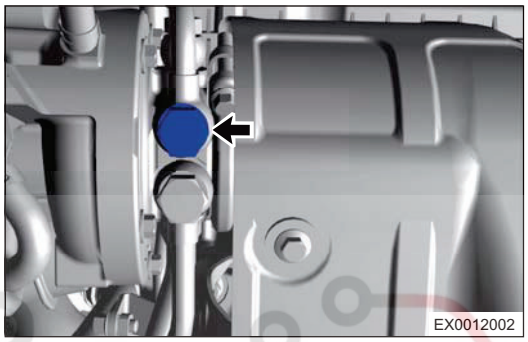


(b) Disconnect the engine wire harness fixing clip (1).



(c) Remove fixing bolt (arrow) from turbocharger water outlet pipe set bracket.
Tightening torque
8 + 3 N·m

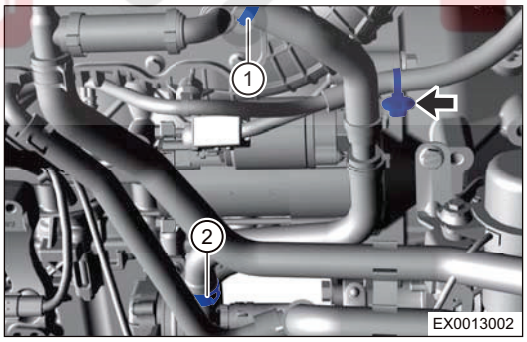
(d) Remove hollow bolt (arrow) between turbocharger water outlet pipe set and turbocharger assembly.
Tightening torque
25 +5 N·m



(e) Remove the turbocharger water outlet pipe set assembly.
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.

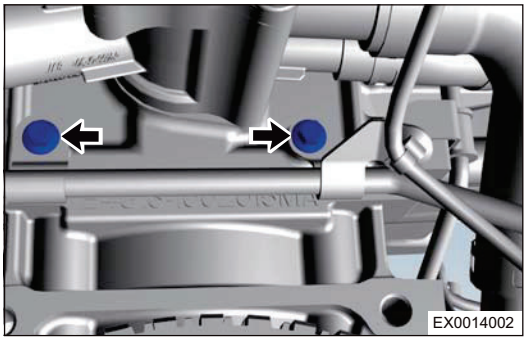
(a) Loosen clamping ring (1) and disconnect connection between turbocharger water inlet pipe set hose and intercooler assembly.



(b) Loosen clamping ring (2) and disconnect connection between electric water pump assembly and water outlet hose.

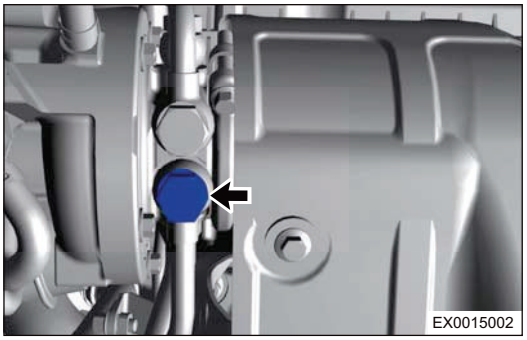
(c) Disconnect the engine wire harness fixing clip (arrow).

(d) Remove 2 fixing bolts (arrow) from turbocharger water inlet pipe set bracket.
Tightening torque
8 + 3 N·m



(e) Remove hollow bolt (arrow) between turbocharger water inlet pipe and turbocharger assembly.

Tightening torque
25 +5 N·m



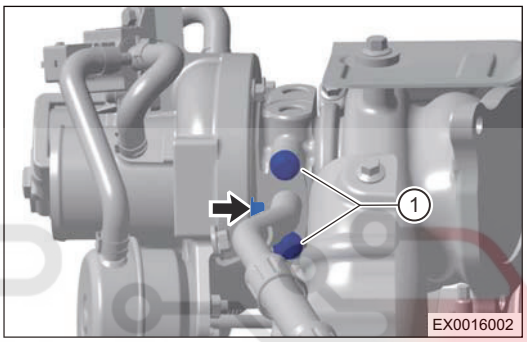
(f) Remove the turbocharger water inlet pipe set assembly.

Caution:
- Pay attention not to drop upper and lower washers of hollow bolt during removal and do not reuse them.

10. Remove the turbocharger fluid return pipe assembly.

(a) Remove fixing bolt (arrow) from turbocharger fluid return pipe bracket.

Tightening torque
8 + 3 N·m

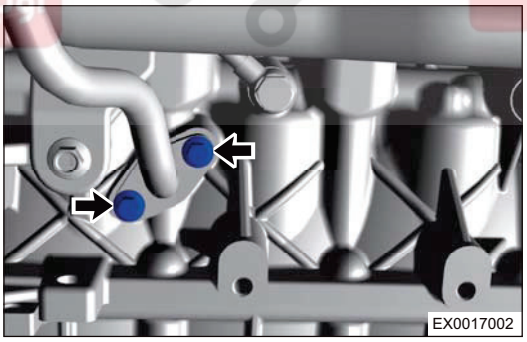


(b) Remove 2 coupling bolts (1) between turbocharger fluid return pipe and turbocharger assembly.

Tightening torque
8 + 3 N·m

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

Tightening torque
8 + 3 N·m



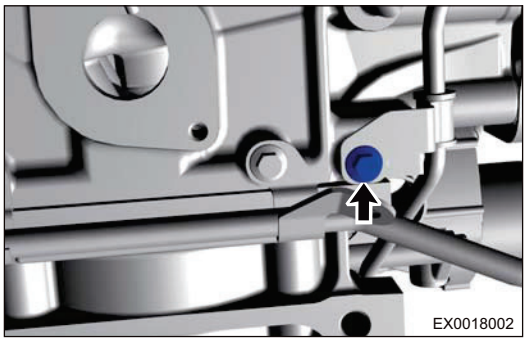
(d) Remove the turbocharger fluid return pipe assembly.

Caution:
- Pay attention not to drop the upper and lower washers and the bolt during removal and do not reuse them.

11. Remove the turbocharger fluid inlet pipe assembly.

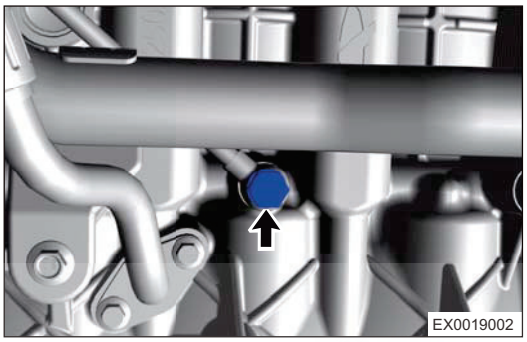
(a) Remove fixing bolt (arrow) from turbocharger fluid inlet pipe bracket.

Tightening torque
8 + 3 N·m



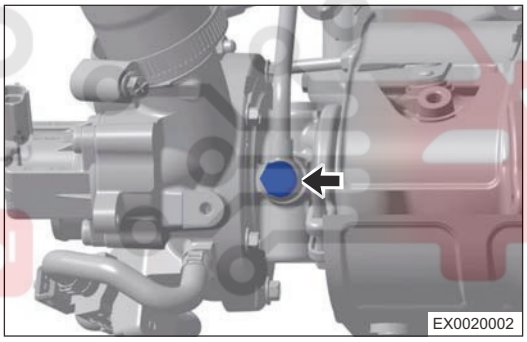
(b) Remove hollow bolt (arrow) between turbocharger fluid inlet pipe and cylinder block assembly.

Tightening torque
20 + 5 N·m



(c) Remove hollow bolt (arrow) between turbocharger water inlet pipe and turbocharger assembly.

Tightening torque
20 + 5 N·m

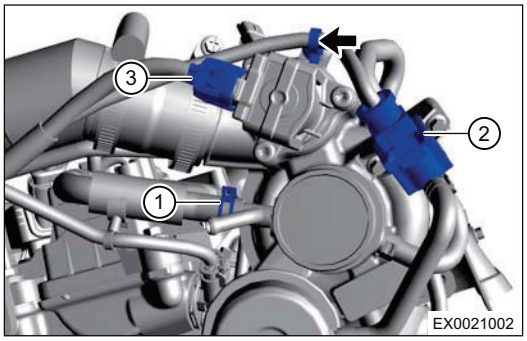


(d) Remove the turbocharger fluid inlet pipe assembly.

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.

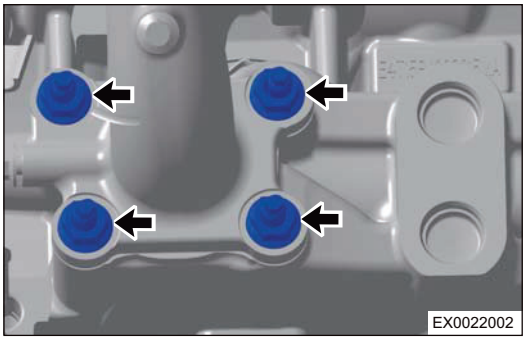
(a) Loosen clamping ring (1) and disconnect connection between crankcase ventilation tube and turbocharger assembly.



(b) Disconnect the exhaust by-pass control solenoid valve connector (2).
(c) Disconnect the engine wire harness fixing clip (arrow).
(d) Disconnect the relief control solenoid valve connector (3).

(e) Remove 4 turbocharger fixing nuts (arrow).

Tightening torque
25 +5 N·m



(f) Remove the turbocharger assembly.

Inspection

1. Firstly perform basic inspection to turbocharger system during DTC with too high, too low boost pressure or when power lowers

   Basic inspection:
   - Check there are no cranks causing by overheating, biting, deformation or other damage on exhaust turbocharger turbo housing, otherwise, replace exhaust turbocharger.
   - Check there are no deposition and blocking on turbo oil hole.
   - Check there are no blockage, squash, deformation or other damage on fluid inlet and return pipes of exhaust turbocharger.
   - Check there are no oil leakage (inside leakage and outside leakage) on exhaust turbocharger.
   - Check that charcoal canister check valve between charcoal canister and front exhaust turbocharger intake hose and check valve between brake booster and intake manifold are correctly installed with the arrow above to point to conduction direction (fault multiple points).
   - Check all lines are connected securely, no leakage, aging, breakage, etc.
2. Turbocharger daily inspection
   (a) Check connecting lines between air filter and turbocharger, turbocharger and engine intake and exhaust pipes for sealing and tightness.
   (b) Check if turbocharger fluid inlet and return pipes are damaged or throttling, 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 in regular.
   (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 Sliding" before there is oil pressure on the engine, 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 and bolt are tightened; if component is damaged, replace damaged component.

1. Installation is in the reverse order of removal.

Exhaust By-pass Control Solenoid Valve

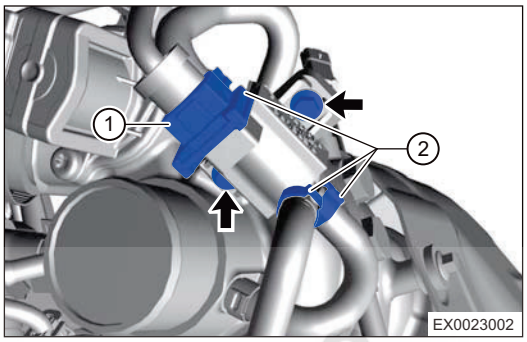
Removal

Warning/Caution/Hint

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 by-pass control solenoid valve.
   (a) Disconnect the exhaust by-pass control solenoid valve connector (1).



   (b) Loosen clamping rings (2) and disconnect 3 connections between hoses and exhaust by-pass control solenoid valve.
   (c) Remove 2 fixing bolts (arrow) from exhaust by-pass control solenoid valve.
   Tightening torque
   3 + 2 N·m
   (d) Remove the exhaust by-pass control solenoid valve assembly.

Installation

1. Installation is in the reverse order of removal.

Precatalytic Converter Assembly

Removal

Warning/Caution/Hint

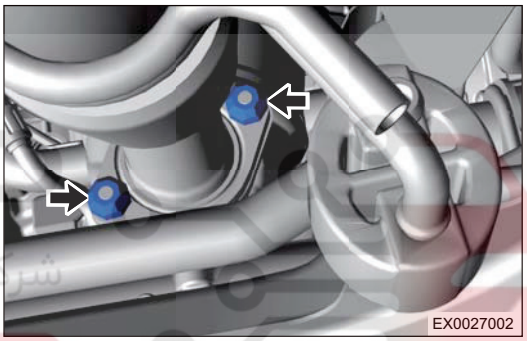
Warning:

- 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.

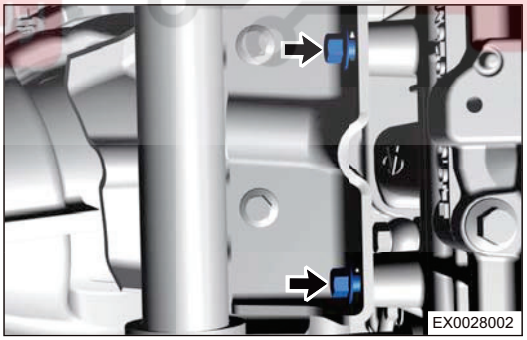
Caution:

- 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.

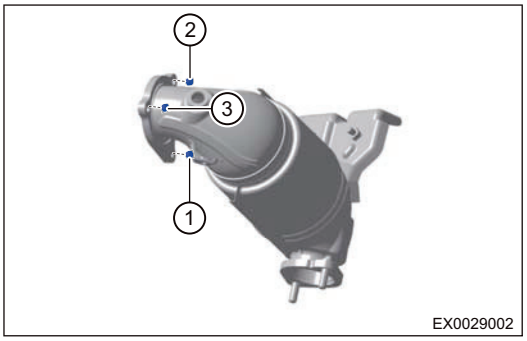
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the turbocharger heat insulator assembly.
5. Remove the precatalytic converter assembly.
   (a) Raise vehicle to a proper position.
   (b) Remove 2 coupling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



   (c) Remove precatalytic converter assembly bracket upper bolt and bracket fixing bolt (arrow).
   Tightening torque
   20 + 5 N·m



   (d) Remove coupling nuts (1) (2) (3) between precatalytic converter and turbocharger.
   Tightening torque
   33 ± 3 N·m
   (1) nut torque increases to 40 ± 3 N·m



   Hint:
   After each removal and installation, the nut cannot be reused and replace it with a new one.

   (e) Remove the precatalytic converter assembly.

(f) Remove the upstream oxygen sensor assembly (1).

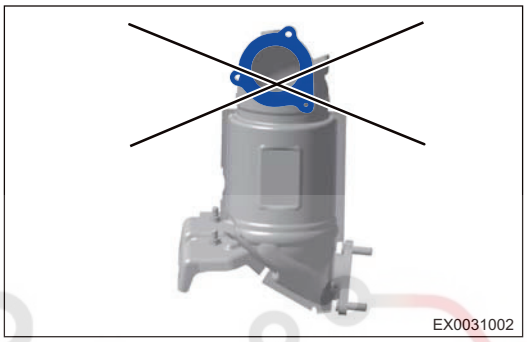
Tightening torque
45 ± 5 N·m


EX0056002

Inspection

1. Check precatalytic converter connection surface warpage.

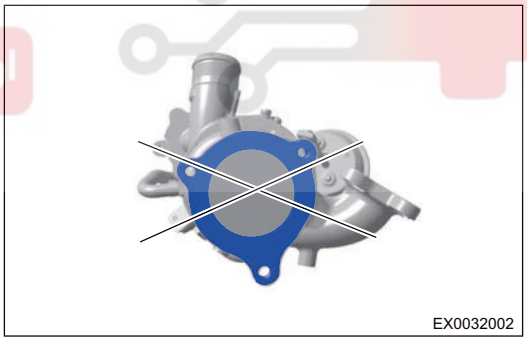
(a) Using a precision straightedge and feeler gauge, measure connection surface between precatalytic converter and turbocharger, replace it if surface warpage is greater than 0.5 mm.


EX0031002

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

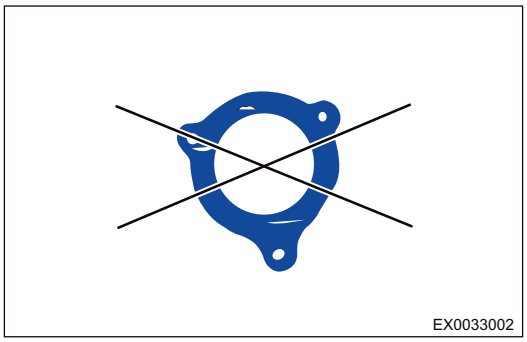
2. Check turbocharger connection surface curvature.

(a) Using a precision straightedge and feeler gauge, measure connection surface between turbocharger and precatalytic converter, replace it if surface curvature is greater than 0.04 mm.


EX0032002

3. Check sealing gasket.

(a) Check sealing gasket for scratch or rough, replace it if necessary.


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 the 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, front exhaust pipe assembly after installation is completed.

1. Installation is in the reverse order of removal.

Front Exhaust Pipe Assembly

Removal

Warning/Caution/Hint

Warning:

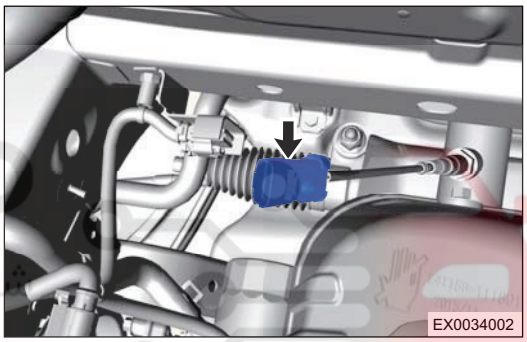
- Temperature of exhaust system is very high when engine is running. Before removal, make sure that engine has stopped running and exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.

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 the ignition 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 coupling nuts (arrow), then disconnect connection between front exhaust pipe assembly and precatalytic converter assembly, and take off gasket from connecting part.

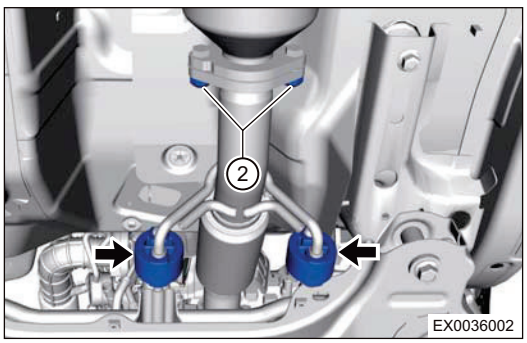
Tightening torque

45 ± 5 N·m

(c) Remove 2 coupling nuts (1), then disconnect connection between front exhaust pipe assembly and main catalytic converter assembly, and take off gasket from connecting part.

Tightening torque

45 ± 5 N·m



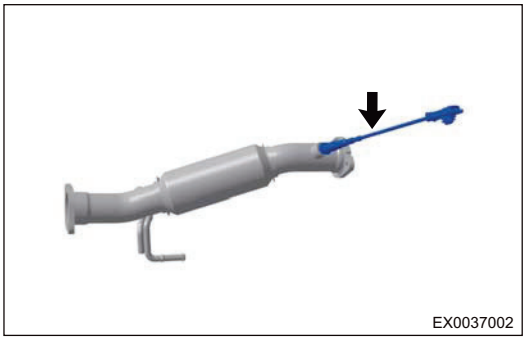
(d) Separate 2 diamond shaped hanger blocks (arrow) between front exhaust pipe assembly and body hook.

(e) Remove the front exhaust pipe assembly.

(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:

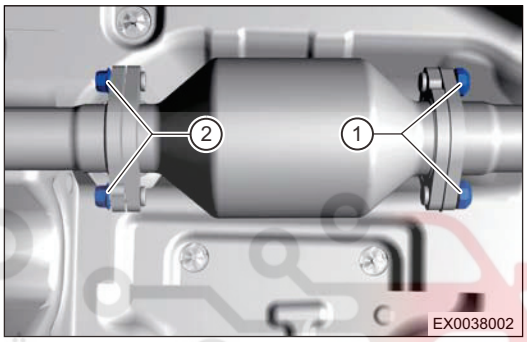
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

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

   (a) Remove 2 coupling nuts (1), then disconnect connection between front exhaust pipe assembly and main catalytic converter assembly, and take off gasket from connecting part.

   Tightening torque

   45 ± 5 N·m



   (b) Remove 2 coupling nuts (2), then disconnect connection between main catalytic converter assembly and muffler assembly, and take off gasket from connecting part.

   Tightening torque

   45 ± 5 N·m

   (c) Remove the main catalytic converter assembly.

Inspection

1. Check precatalytic converter internal carrier for cracked, detachment, blocked, etc. Replace precatalytic converter assembly if damaged.

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.
- If there is any crack or leakage in main catalytic converter assembly, replace it.

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:

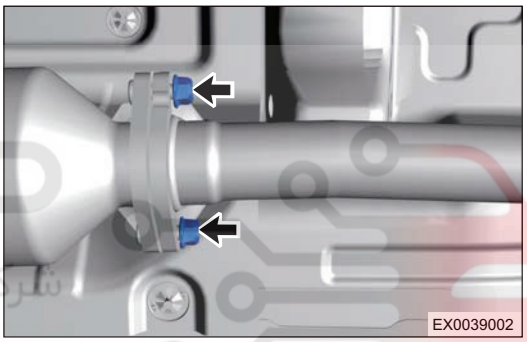
- When removing muffler assembly, an assistant is needed to hold it. This can prevent muffler assembly from dropping during operation, which may cause an accident.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched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

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

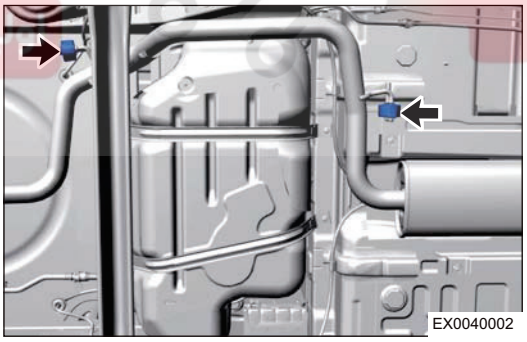
(a) Remove 2 coupling nuts (arrow), then disconnect connection between muffler assembly and main catalytic converter assembly, and take off gasket from connecting part

Tightening torque

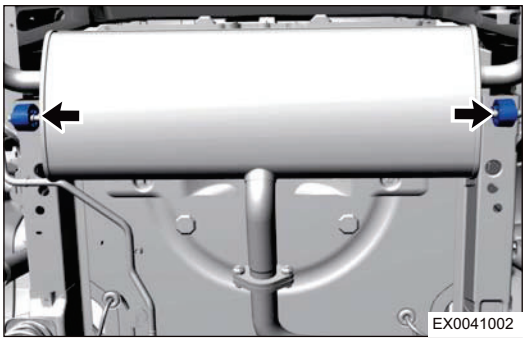
45 ± 5 N·m



(b) Separate 2 diamond shaped hanger blocks (arrow) between muffler assembly and body hook.

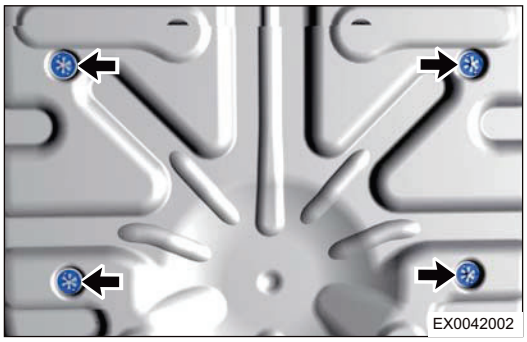


(c) Separate 2 diamond shaped hanger blocks (arrow) between rear muffler assembly and body hook.



(d) Remove the muffler assembly.

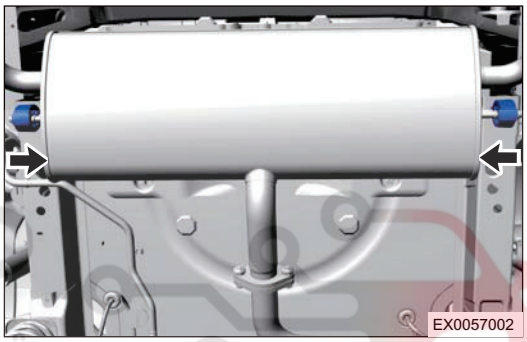
5. Remove muffler heat insulator.
   (a) Remove 4 fixing clamping pieces (arrow) and remove muffler heat insulator.



Inspection

1. Inspect muffler.
   (a) Inspect if there are cracks or leakage on muffler assembly surface. Replace it if necessary.
   (b) Inspect if there are blocked or normal draining on muffler left and right drain holes (arrow). If it can drain water normally.

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. Cause icing. It may cause engine to fail to start.



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.

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