

ENGINE SECTION 2

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

FUEL INJECTION (FUEL SYSTEMS) FU(H6DO)

**EMISSION CONTROL
(AUX. EMISSION CONTROL DEVICES) EC(H6DO)**

INTAKE (INDUCTION) IN(H6DO)

MECHANICAL ME(H6DO)

EXHAUST EX(H6DO)

COOLING CO(H6DO)

LUBRICATION LU(H6DO)

SPEED CONTROL SYSTEMS SP(H6DO)

IGNITION IG(H6DO)

STARTING/CHARGING SYSTEMS SC(H6DO)

ENGINE (DIAGNOSTICS) EN(H6DO)

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) *EC(H6DO)*

	Page
1. General Description	2
2. Front Catalytic Converter	3
3. Rear Catalytic Converter	6
4. Canister.....	7
5. Purge Control Solenoid Valve	8
6. EGR Valve	10
7. Two-way valve	12

GENERAL DESCRIPTION

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

1. General Description

A: CAUTION

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Before disconnecting electrical connectors of sensors or units, be sure to disconnect ground cable from battery.

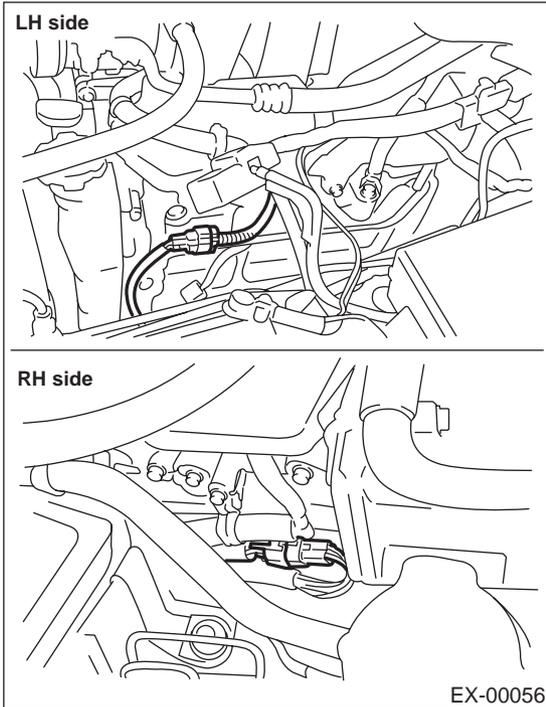
FRONT CATALYTIC CONVERTER

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

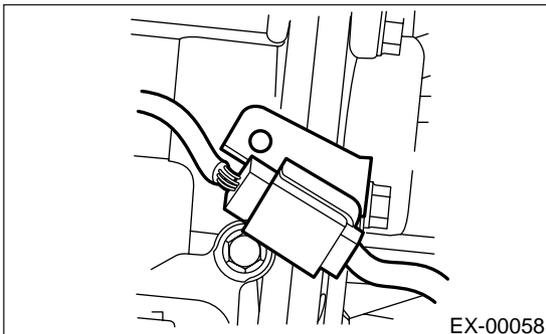
2. Front Catalytic Converter

A: REMOVAL

- 1) Set the vehicle on the lift.
- 2) Remove battery.
- 3) Remove air cleaner case and air intake duct.
<Ref. to IN(H6DO)-5, REMOVAL, Air Cleaner.>
and <Ref. to IN(H6DO)-7, REMOVAL, Air Intake Duct.>
- 4) Disconnect front oxygen (A/F) sensor connectors.



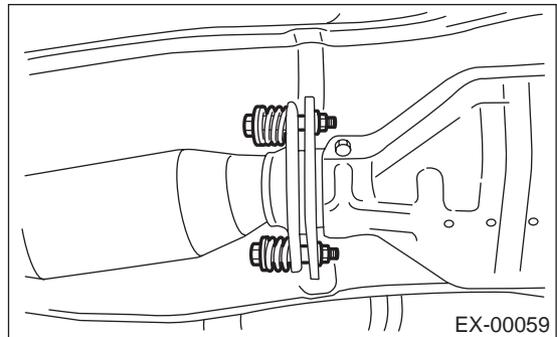
- 5) Lift-up the vehicle.
- 6) Remove under cover.
- 7) Remove front oxygen (A/F) sensor harness from the clips attached to both right and left cylinder head covers.
- 8) Disconnect connector from rear oxygen sensor connector.



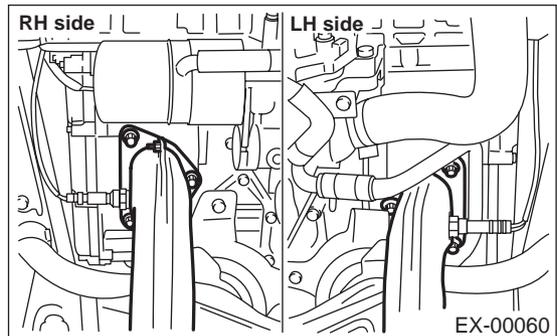
- 9) Separate front exhaust pipe from rear exhaust pipe.

CAUTION:

Be careful, exhaust pipe is hot.



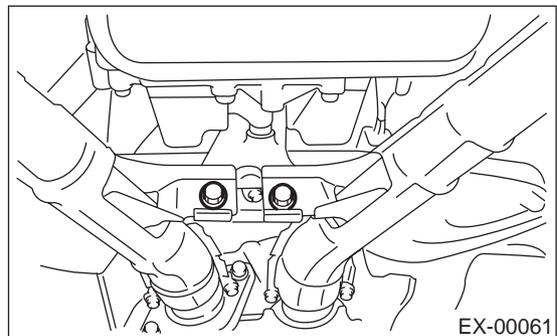
- 10) Remove nuts which hold front exhaust pipe onto cylinder heads.



- 11) Remove front exhaust pipe from hanger bracket.

CAUTION:

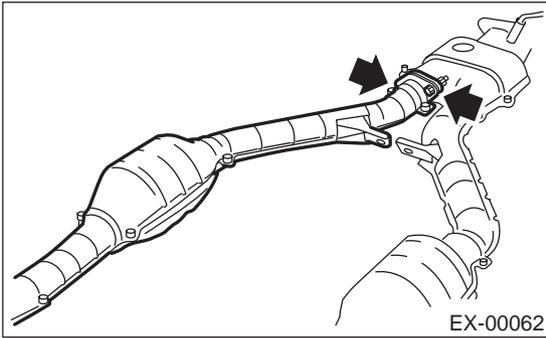
Be careful not to pull down front exhaust pipe.



FRONT CATALYTIC CONVERTER

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

12) Separate front catalytic converter (RH) from front exhaust pipe.



B: INSTALLATION

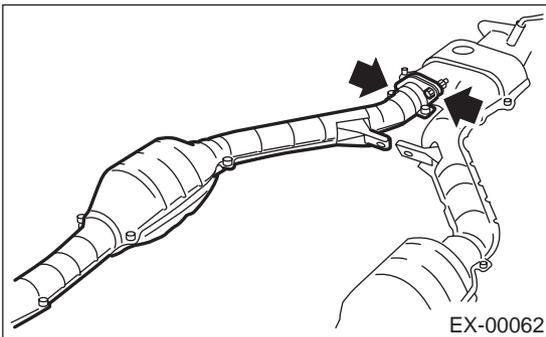
NOTE:

Replace gaskets with new ones.

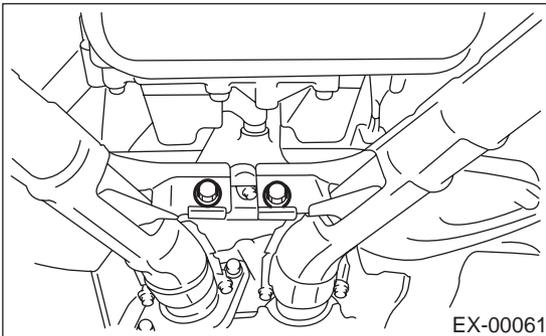
1) Install front catalytic converter (RH) to front exhaust pipe.

Tightening torque:

30 N·m (3.1 kgf·m, 22.4 ft·lb)



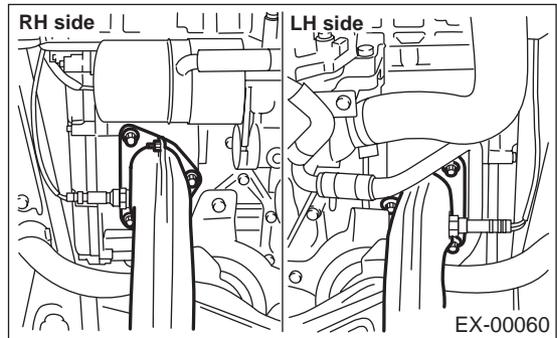
2) Install front exhaust pipe assembly to the vehicle. And temporarily tighten bolt which installs front exhaust pipe to hanger bracket.



3) Tighten nuts which hold front exhaust pipe onto cylinder heads.

Tightening torque:

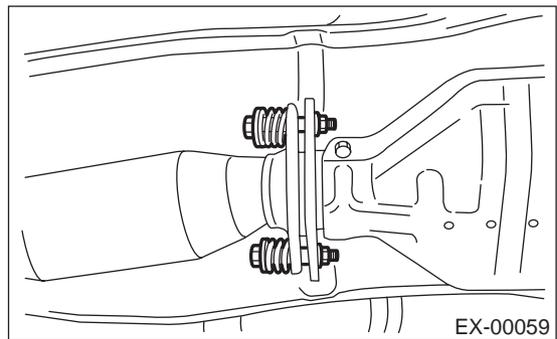
30 N·m (3.1 kgf·m, 22.4 ft·lb)



4) Tighten bolts which secure front exhaust pipe assembly to rear exhaust pipe.

Tightening torque:

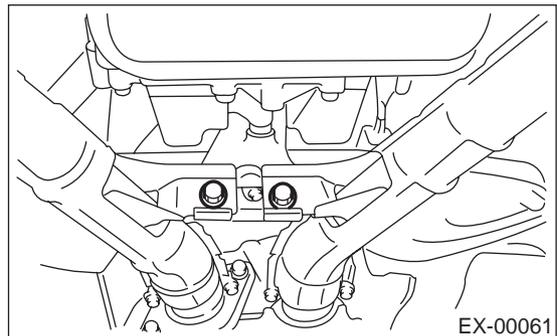
18 N·m (1.8 kgf·m, 13.0 ft·lb)



5) Tighten bolt which holds front exhaust pipes to hanger bracket.

Tightening torque:

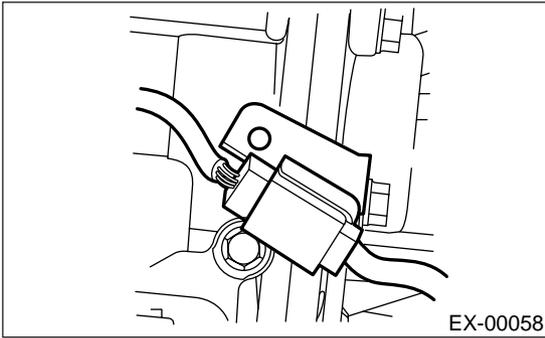
35 N·m (3.6 kgf·m, 26.0 ft·lb)



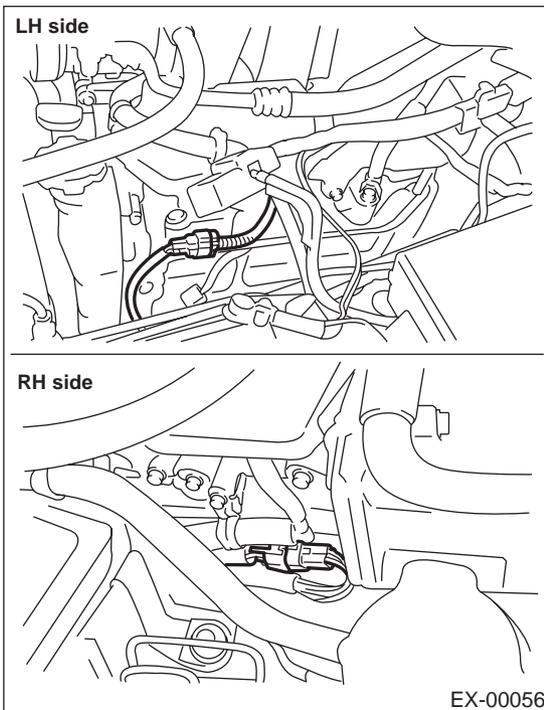
FRONT CATALYTIC CONVERTER

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

- 6) Connect connector to rear oxygen sensor connector.



- 7) Install front oxygen (A/F) sensor harness to the clips attached to the cylinder head covers.
- 8) Install under cover.
- 9) Lower the vehicle.
- 10) Connect front oxygen (A/F) sensor connector.



- 11) Install air cleaner case and air intake duct. <Ref. to IN(H6DO)-5, INSTALLATION, Air Cleaner.> and <Ref. to IN(H6DO)-7, INSTALLATION, Air Intake Duct.>
- 12) Install battery.

C: INSPECTION

- 1) Make sure there are no exhaust leaks from connections and welds.
- 2) Make sure there are no holes or rusting.

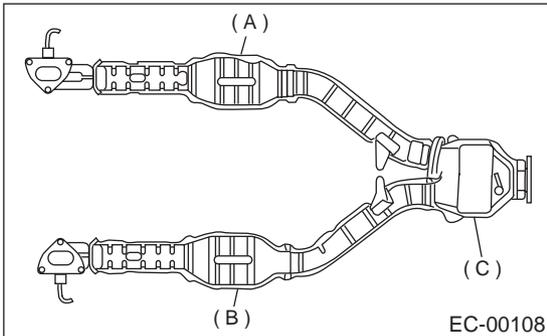
REAR CATALYTIC CONVERTER

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

3. Rear Catalytic Converter

A: REMOVAL

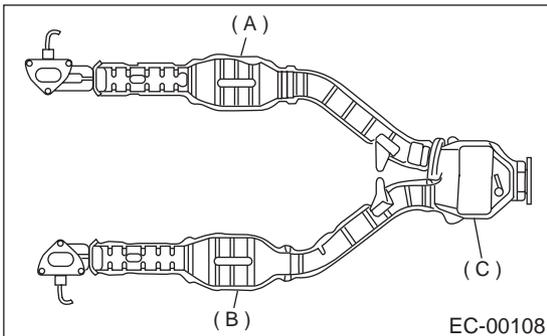
The front and rear catalytic converter are integrated into one unit. Therefore, the removal and installation procedures are the same as the those for the front catalytic converter. <Ref. to EC(H6DO)-3, REMOVAL, Front Catalytic Converter.>



- (A) Front catalytic converter RH
- (B) Front catalytic converter LH
- (C) Rear catalytic converter

B: INSTALLATION

The front and rear catalytic converter are integrated into one unit. Therefore, the removal and installation procedures are the same as the ones described under front catalytic converter. <Ref. to EC(H6DO)-4, INSTALLATION, Front Catalytic Converter.>



- (A) Front catalytic converter RH
- (B) Front catalytic converter LH
- (C) Rear catalytic converter

C: INSPECTION

- 1) Make sure there are no exhaust leaks from connections and welds.
- 2) Make sure there are no holes or rusting.

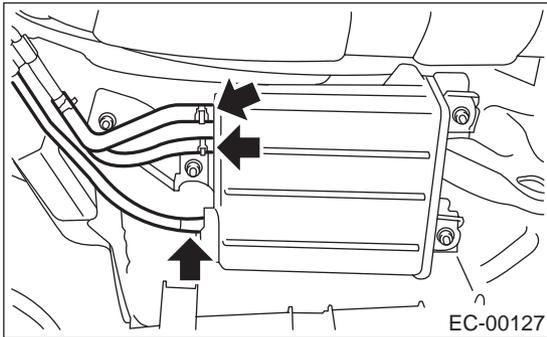
CANISTER

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

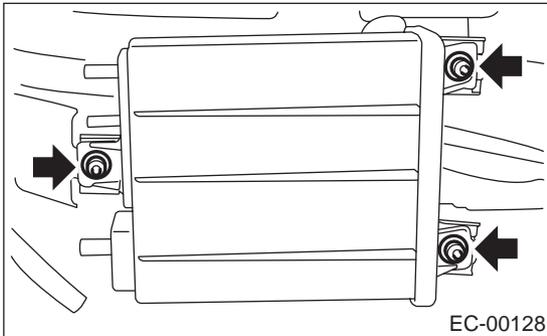
4. Canister

A: REMOVAL

- 1) Lift-up the vehicle.
- 2) Loosen two clamps which hold two canister hoses, and disconnect evaporation hoses from canister.



- 3) Remove canister from body.

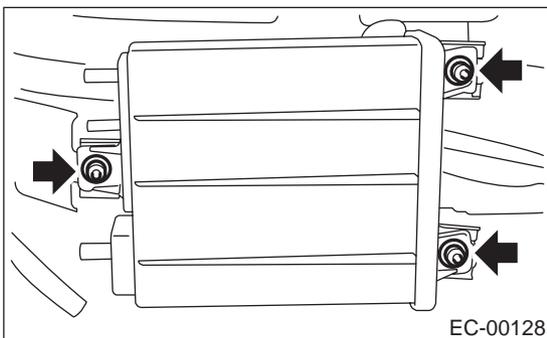


B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

23 N·m (2.3 kgf-m, 17 ft-lb)



C: INSPECTION

Make sure the canister and canister hoses are not cracked or loose.

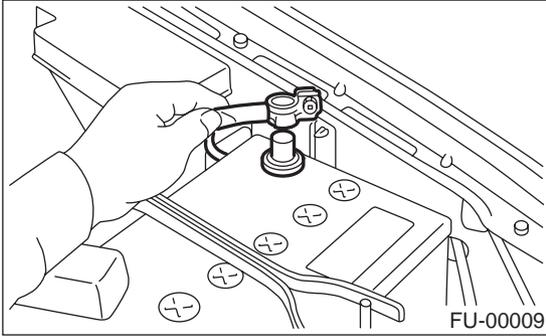
PURGE CONTROL SOLENOID VALVE

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

5. Purge Control Solenoid Valve

A: REMOVAL

1) Disconnect battery ground cable.

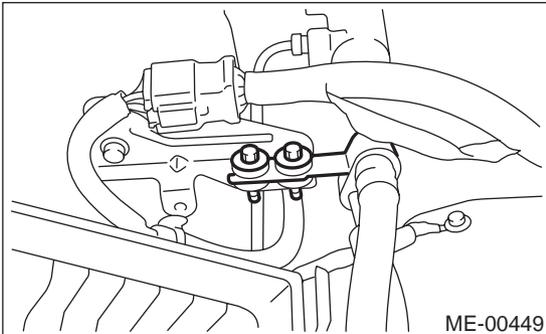


2) Remove power steering pump from bracket.

(1) Remove air intake duct and air cleaner case. <Ref. to IN(H6DO)-5, REMOVAL, Air Cleaner.> and <Ref. to IN(H6DO)-7, REMOVAL, Air Intake Duct.>

(2) Remove V-belt. <Ref. to ME(H6DO)-28, REMOVAL, V-belt.>

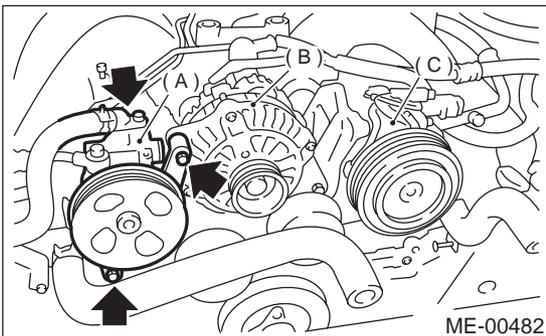
(3) Remove power steering oil pipe with bracket.



(4) Remove bolts which install power steering pump bracket.

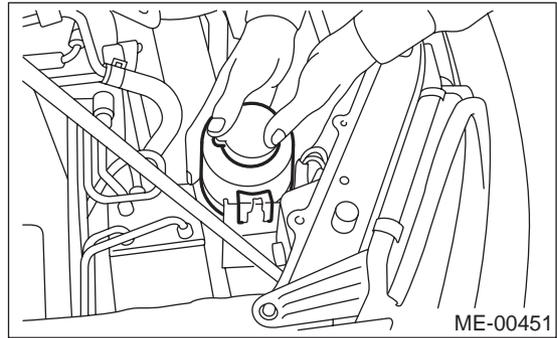
CAUTION:

Do not separate hose and pipe from the pump main unit.

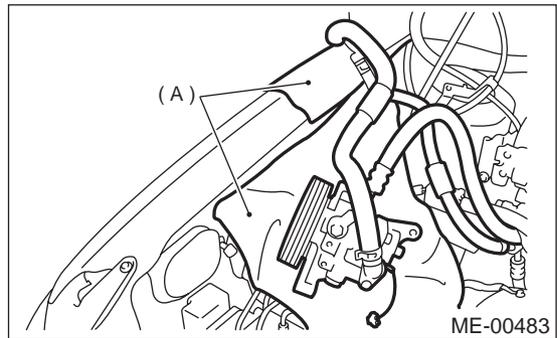


- (A) Power steering pump
- (B) Generator
- (C) A/C compressor

(5) Remove power steering tank from the bracket by pulling it upward.

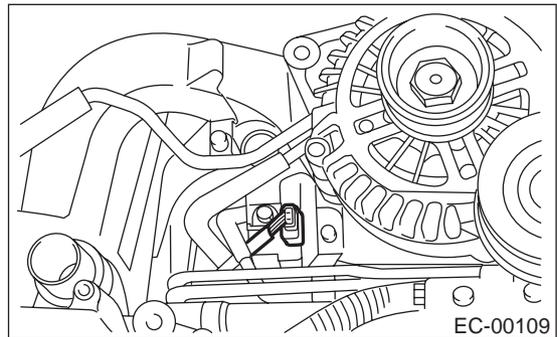


(6) Place power steering pump on the right side wheel apron.

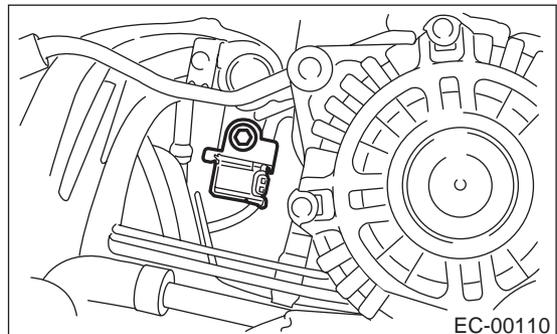


(A) Cloth

3) Disconnect connector and hoses from purge control solenoid valve.



4) Remove bolt which installs purge control solenoid valve onto intake manifold.



PURGE CONTROL SOLENOID VALVE

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

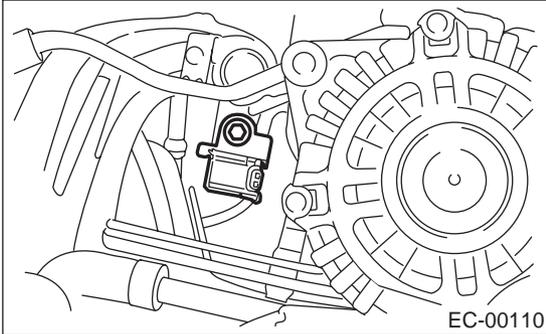
5) Take out purge control solenoid valve through the bottom of the intake manifold.

B: INSTALLATION

Install in the reverse order of removal.

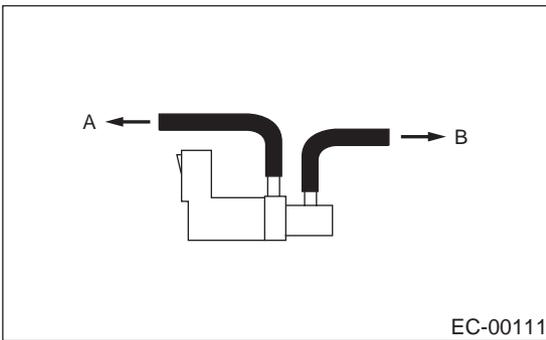
Tightening torque:

19 N·m (1.9 kgf-m, 14 ft-lb)



CAUTION:

Carefully connect the evaporation hoses.



A: To fuel pipe

B: To intake manifold

C: INSPECTION

Make sure hoses are not cracked or loose.

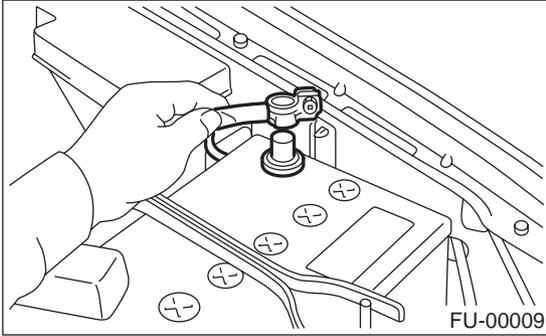
EGR VALVE

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

6. EGR Valve

A: REMOVAL

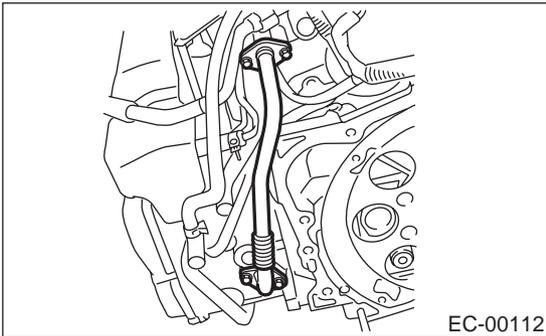
1) Disconnect battery ground cable.



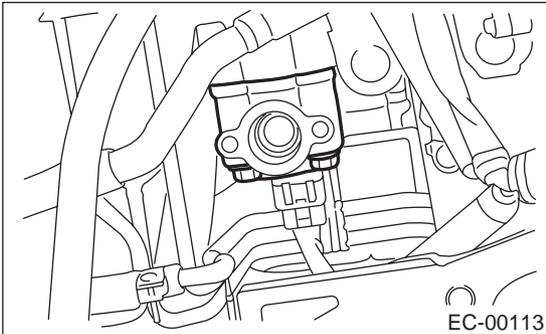
2) Remove air intake chamber. <Ref. to IN(H6DO)-6, REMOVAL, Air Intake Chamber.>

3) Remove starter. <Ref. to SC(H6DO)-6, REMOVAL, Starter.>

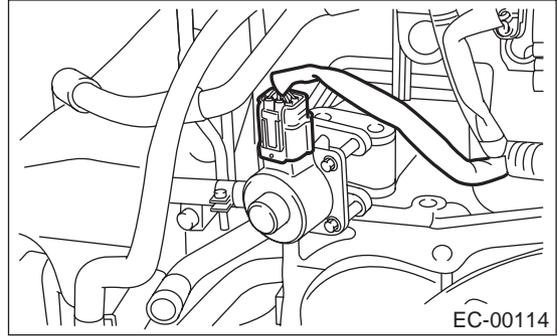
4) Remove EGR pipe from EGR valve and cylinder head.



5) Remove EGR valve from intake manifold.



6) Disconnect connector from EGR valve.

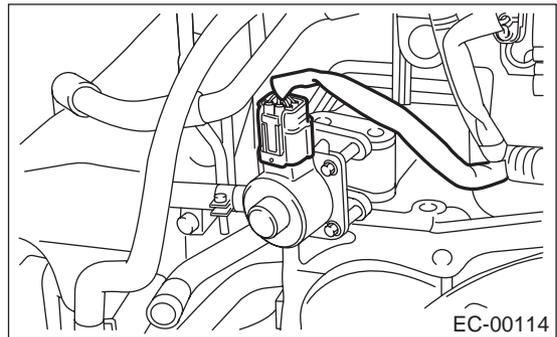


B: INSTALLATION

NOTE:

Replace old gaskets with new one.

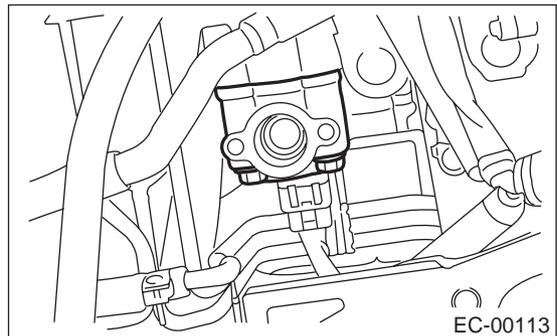
1) Connect connector EGR valve.



2) Install EGR valve to intake manifold.

Tightening torque:

19 N·m (1.9 kgf-m, 14 ft-lb)



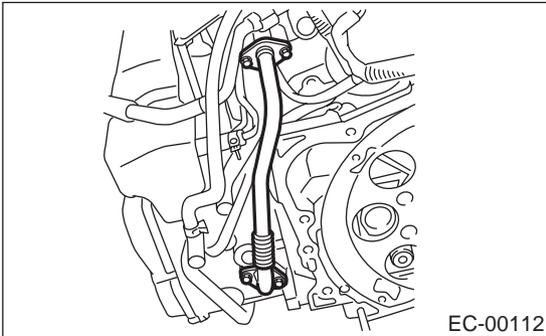
EGR VALVE

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

3) Install EGR pipe to EGR valve and cylinder head.

Tightening torque:

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)



4) Install starter. <Ref. to SC(H6DO)-6, INSTALLATION, Starter.>

5) Install air intake chamber. <Ref. to IN(H6DO)-6, INSTALLATION, Air Intake Chamber.>

6) Connect battery ground cable.

C: INSPECTION

1) Check the EGR valve for proper valve movement.

2) Check the EGR pipe, etc., for blockages or cracks.

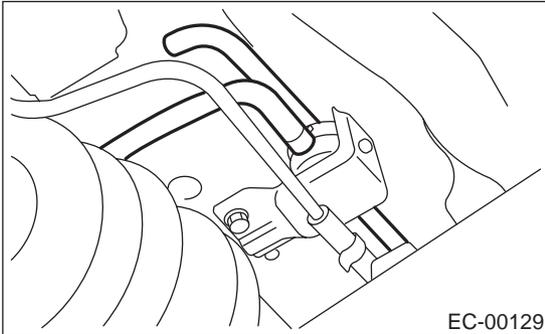
TWO-WAY VALVE

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)

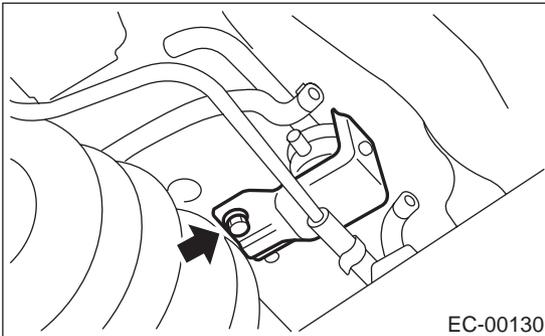
7. Two-way valve

A: REMOVAL

- 1) Lift-up the vehicle.
- 2) Disconnect hoses from two-way valve.



- 3) Remove two-way valve with bracket as a single unit from body.



- 4) Remove two-way valve from bracket.

B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

Make sure that hoses are not cracked or loose.