

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(H4DOTC)

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) EC(H4DOTC)

INTAKE (INDUCTION) IN(H4DOTC)

MECHANICAL ME(H4DOTC)

EXHAUST EX(H4DOTC)

COOLING CO(H4DOTC)

LUBRICATION LU(H4DOTC)

SPEED CONTROL SYSTEMS SP(H4DOTC)

IGNITION IG(H4DOTC)

STARTING/CHARGING SYSTEMS SC(H4DOTC)

ENGINE (DIAGNOSTICS) EN(H4DOTC)(diag)

EXHAUST

EX(H4DOTC)

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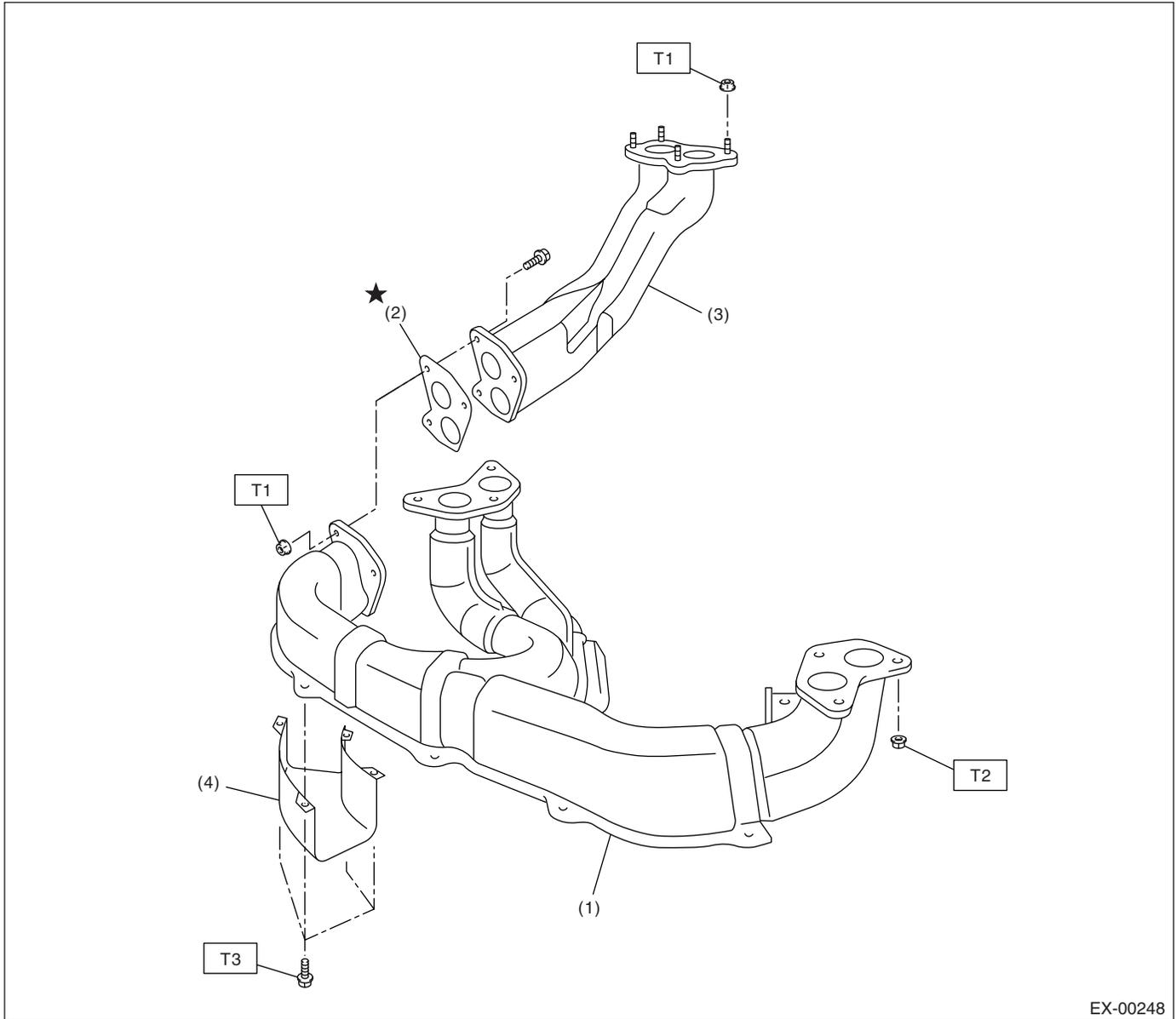
General Description

EXHAUST

1. General Description

A: COMPONENT

1. FRONT EXHAUST PIPE



EX-00248

- (1) Front exhaust pipe ASSY
- (2) Gasket
- (3) Turbocharger joint pipe
- (4) Front exhaust pipe cover

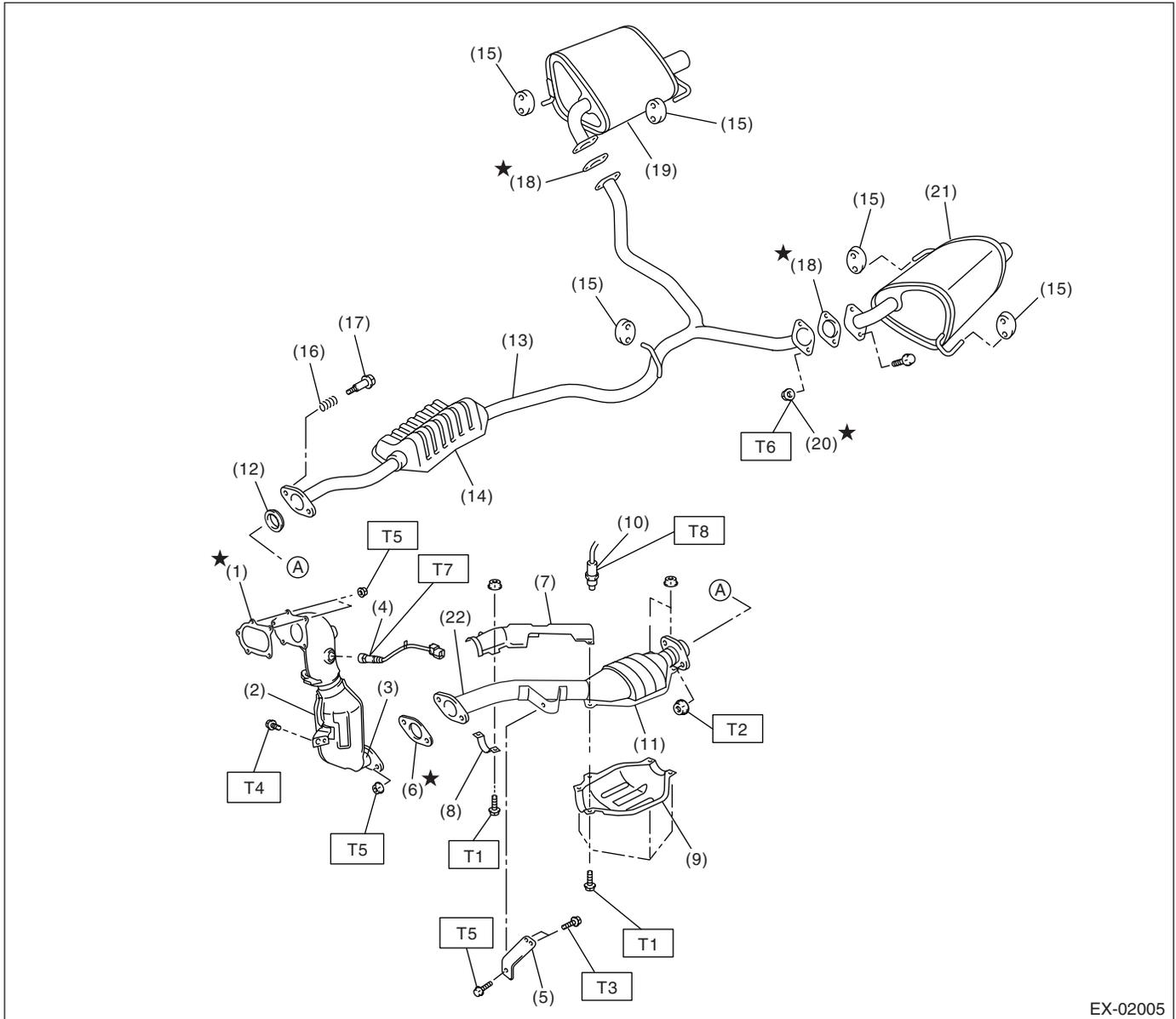
Tightening torque: N·m (kgf·m, ft·lb)

T1: 35 (3.6, 26.0)

T2: 30 (3.1, 22.1)

T3: 7.5 (0.76, 5.5)

2. CENTER AND REAR EXHAUST PIPE, AND MUFFLER



EX-02005

- | | |
|--|---------------------------------|
| (1) Gasket | (12) Gasket |
| (2) Front catalytic converter | (13) Rear exhaust pipe |
| (3) Center exhaust pipe (Front) | (14) Chamber |
| (4) Front oxygen (A/F) sensor | (15) Cushion rubber |
| (5) Bracket | (16) Spring |
| (6) Gasket | (17) Bolt |
| (7) Center pipe upper cover (Rear) | (18) Gasket |
| (8) Clamp | (19) Muffler (RH) |
| (9) Rear catalytic converter lower cover | (20) Self-locking nut |
| (10) Rear oxygen sensor | (21) Muffler (LH) |
| (11) Rear catalytic converter | (22) Center exhaust pipe (Rear) |

Tightening torque: N·m (kgf·m, ft·lb)

- T1: 13 (1.3, 9.6)**
T2: 18 (1.8, 13.3)
T3: 23 (2.3, 17.0)
T4: 30 (3.1, 22.1)
T5: 35 (3.6, 26.0)
T6: 48 (4.9, 35.4)
T7: <Ref. to FU(H4DOTC)-33, INSTALLATION, Front Oxygen (A/F) Sensor.>
T8: <Ref. to FU(H4DOTC)-34, INSTALLATION, Rear Oxygen Sensor.>

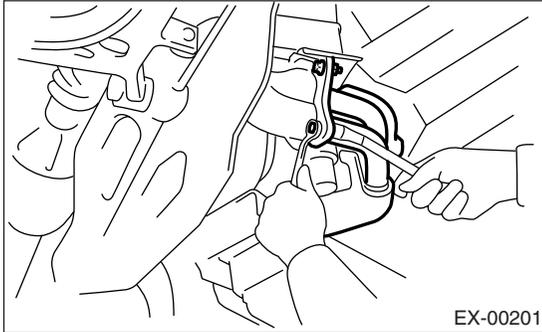
B: CAUTION

- Wear work 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 and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Be careful not to burn yourself, 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 rigid racks at the specified points.
- Before disconnecting electrical connectors of sensors or units, be sure to disconnect the ground cable from battery.

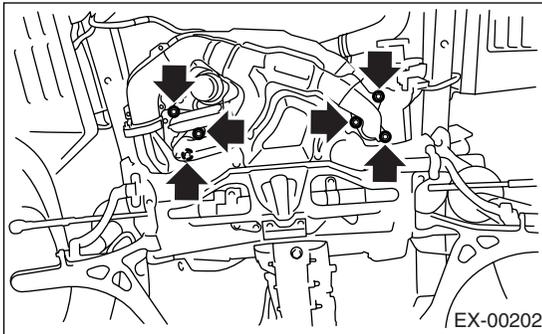
2. Front Exhaust Pipe

A: REMOVAL

- 1) Lift-up the vehicle.
- 2) Remove the under cover.
- 3) Remove the front exhaust pipe cover.
- 4) Remove the nuts which hold front exhaust pipe assembly onto turbocharger joint pipe.



- 5) While holding the front exhaust pipe assembly, remove the nuts which hold front exhaust pipe assembly to cylinder head exhaust port.



- 6) Remove the front exhaust pipe assembly.

B: INSTALLATION

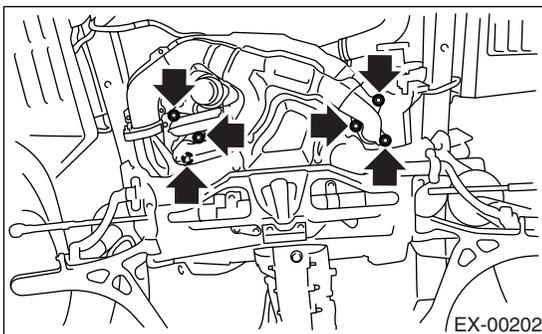
NOTE:

Use a new gasket.

- 1) Install the front exhaust pipe assembly.

Tightening torque:

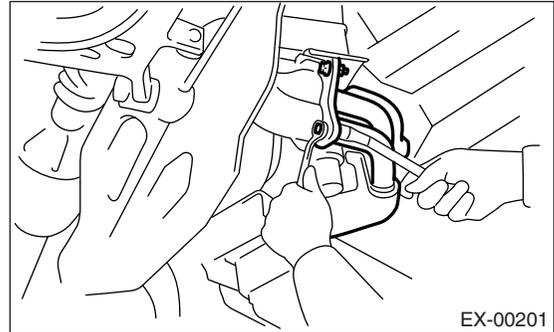
30 N·m (3.1 kgf·m, 22.1 ft·lb)



- 2) Install the front exhaust pipe assembly to turbocharger joint pipe.

Tightening torque:

35 N·m (3.6 kgf·m, 26.0 ft·lb)



- 3) Install the front exhaust pipe cover.
- 4) Install the under cover.
- 5) Lower the vehicle.

C: INSPECTION

- 1) Check the connections and welds for exhaust leaks.
- 2) Check the rear exhaust pipe for holes or rust.

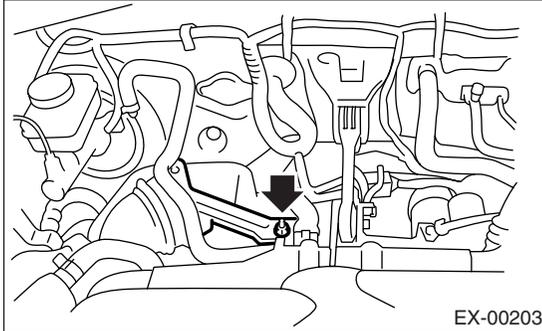
Center Exhaust Pipe

EXHAUST

3. Center Exhaust Pipe

A: REMOVAL

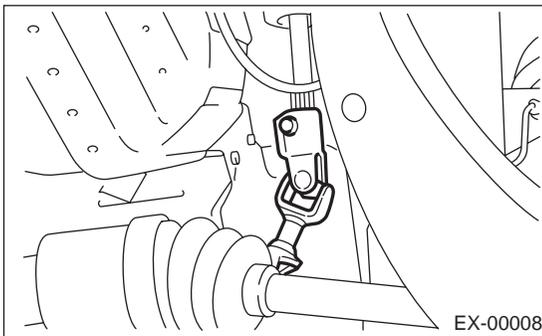
- 1) Set the vehicle on a lift.
- 2) Remove the collector cover.
- 3) Disconnect the ground cable from battery.
- 4) Remove the intercooler. <Ref. to IN(H4DOTC)-12, REMOVAL, Intercooler.>
- 5) Remove the intercooler bracket.



- 6) Lift-up the vehicle.
- 7) Remove the under cover.
- 8) Remove the universal joint bolts and then remove the universal joint.

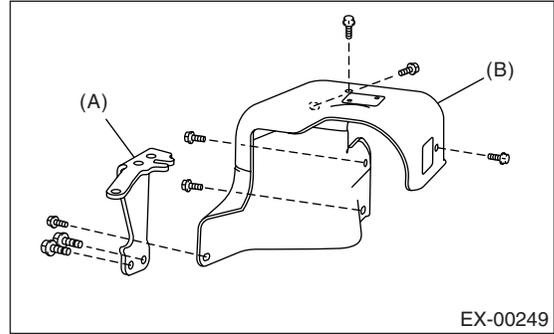
CAUTION:

Scribe alignment marks on the universal joint so that it can be reassembled at the original serration.



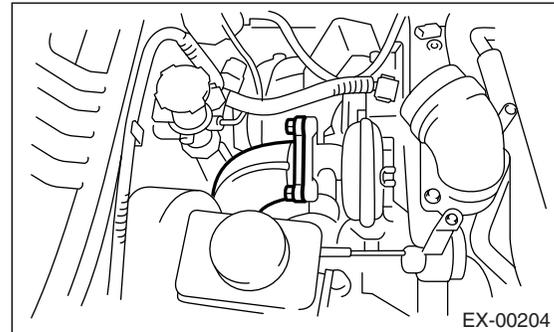
- 9) Lower the vehicle.
- 10) Remove the linear motion mounting. <Ref. to ME(H4DOTC)-37, REMOVAL, Linear Motion Mounting.>
- 11) Remove the linear motion mounting bracket.

- 12) Remove the turbocharger cover.

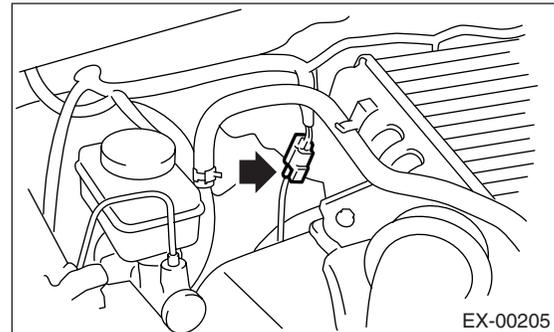


- (A) Linear motion mounting bracket
(B) Turbocharger cover

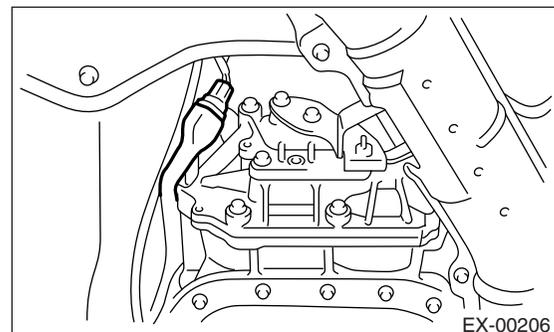
- 13) Separate the center exhaust pipe from turbocharger.



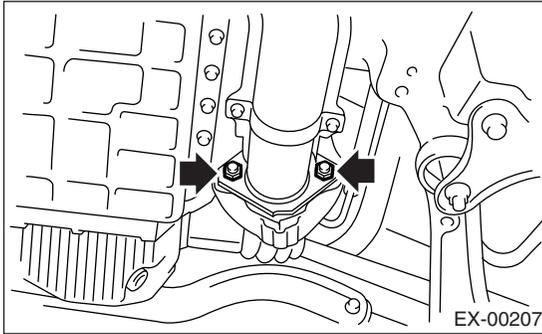
- 14) Disconnect the connector from front oxygen (A/F) sensor.



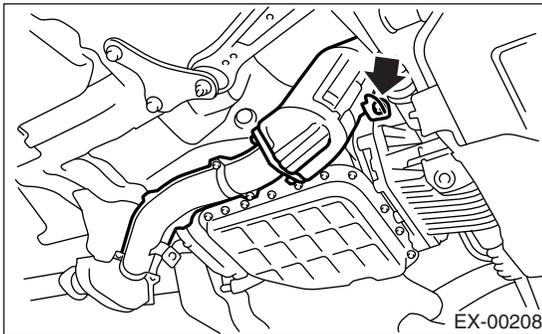
- 15) Lift-up the vehicle.
- 16) Disconnect the connector from rear oxygen sensor.



17) Separate the center exhaust pipe from rear exhaust pipe.



18) Remove the bolt which holds center exhaust pipe bracket to transmission.

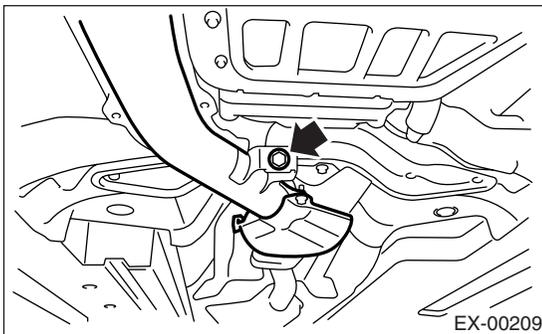


19) Remove the intercooler bracket.

20) Remove the bolt which holds center exhaust pipe to hanger bracket.

CAUTION:

Be careful not to pull down the center exhaust pipe.



21) Remove the center exhaust pipe.

B: INSTALLATION

NOTE:

Use a new gasket.

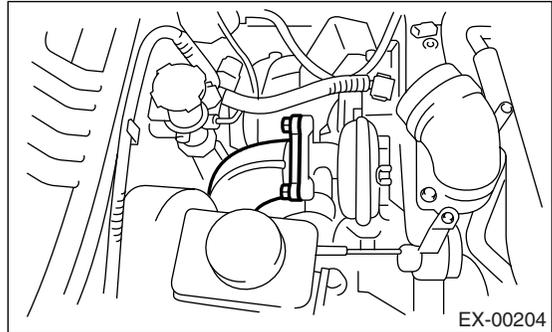
1) Install the center exhaust pipe and temporarily tighten the bolt which holds center exhaust pipe to hanger bracket.

2) Temporarily tighten the bolt which holds center exhaust pipe to transmission.

3) Connect the center exhaust pipe to turbocharger.

Tightening torque:

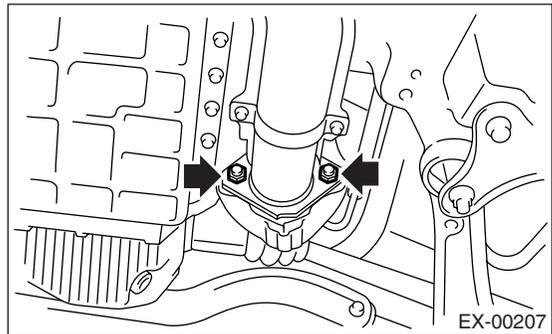
35 N·m (3.6 kgf-m, 26.0 ft-lb)



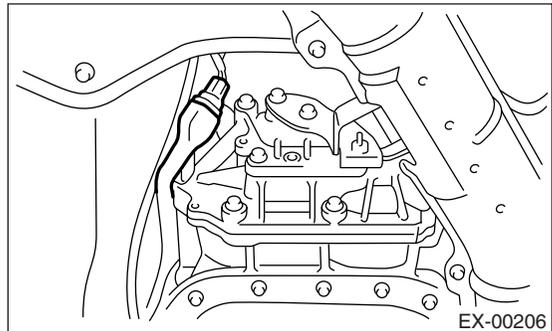
4) Install the center exhaust pipe to rear exhaust pipe.

Tightening torque:

35 N·m (3.6 kgf-m, 26.0 ft-lb)



5) Connect the connector to rear oxygen sensor.



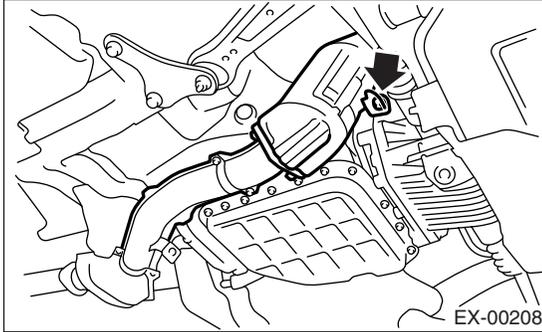
Center Exhaust Pipe

EXHAUST

6) Tighten the bolt which holds center exhaust pipe bracket to transmission.

Tightening torque:

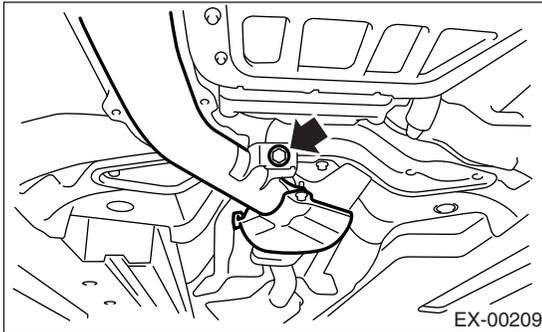
30 N·m (3.1 kgf-m, 22.1 ft-lb)



7) Tighten the bolt which holds center exhaust pipe to hanger bracket.

Tightening torque:

35 N·m (3.6 kgf-m, 26.0 ft-lb)



8) Lower the vehicle.

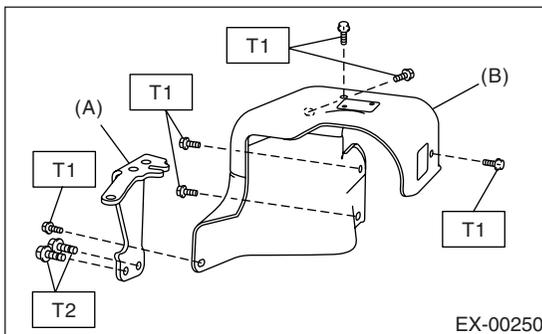
9) Install the turbocharger cover.

10) Install the linear motion mounting bracket.

Tightening torque:

T1: 7.4 N·m (0.75 kgf-m, 5.4 ft-lb)

T2: 40 N·m (4.1 kgf-m, 29.5 ft-lb)

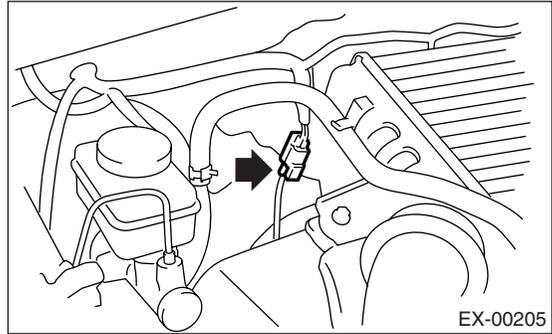


(A) Linear motion mounting bracket

(B) Turbocharger cover

11) Install the linear motion mounting. <Ref. to ME(H4DOTC)-37, INSTALLATION, Linear Motion Mounting.>

12) Connect the connector of front oxygen (A/F) sensor.



13) Lift-up the vehicle.

14) Install the universal joint.

(1) Align the bolt hole on the long yoke side of universal joint with the cutout at the serrated section of shaft end, and then insert the universal joint.

(2) Align the bolt hole on the short yoke side of universal joint with the cutout at the serrated section of gearbox assembly. Lower the universal joint completely.

(3) Temporarily tighten the bolt of short yoke side. Raise the universal joint to make sure the bolt is properly passing through the cutout at the serrated section.

(4) Tighten the long yoke side bolt, and also tighten the short yoke side bolt.

Tightening torque:

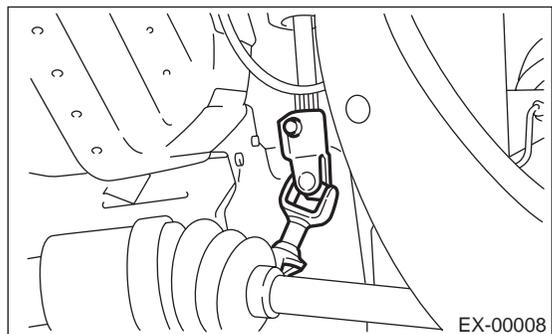
24 N·m (2.4 kgf-m, 17.4 ft-lb)

CAUTION:

- Make sure the universal joint bolts are tightened through the shaft serration notches.
- Excessively large tightening torque of universal joint bolts may lead to heavy steering wheel operation.

Standard clearance between gearbox and DOJ:

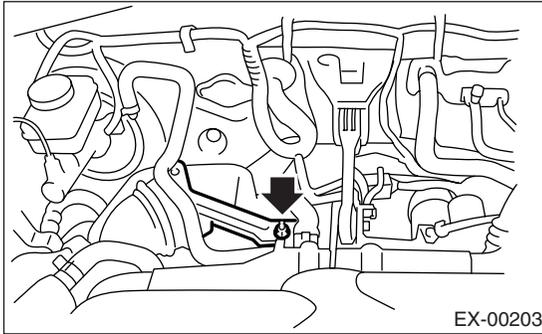
15 mm (0.59 in) or more



15) Install the under cover.

16) Lower the vehicle.

17) Install the intercooler bracket.



18) Install the intercooler. <Ref. to IN(H4DOTC)-12, INSTALLATION, Intercooler.>

19) Install the collector cover.

C: INSPECTION

- 1) Check the connections and welds for exhaust leaks.
- 2) Check the rear exhaust pipe for holes or rust.

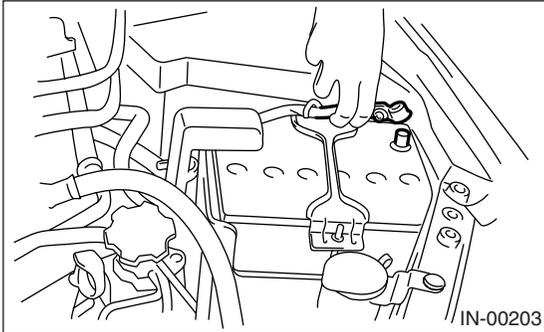
Joint Pipe

EXHAUST

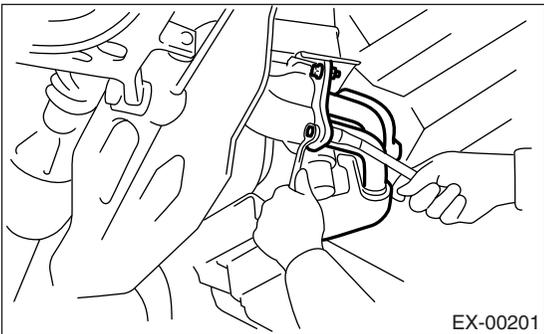
4. Joint Pipe

A: REMOVAL

- 1) Remove the collector cover.
- 2) Disconnect the ground cable from battery.



- 3) Lift-up the vehicle.
- 4) Remove the under cover.
- 5) Remove the front exhaust pipe cover.
- 6) Remove the nuts which hold front exhaust manifold to turbocharger joint pipe.



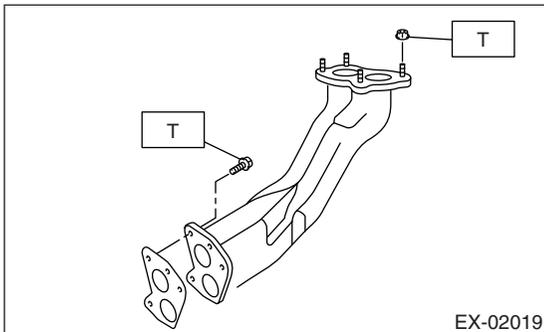
- 7) Remove the center exhaust pipe.
<Ref. to EX(H4DOTC)-6, REMOVAL, Center Exhaust Pipe.>
- 8) Remove the turbocharger. <Ref. to IN(H4DOTC)-14, REMOVAL, Turbocharger.>
- 9) Remove the joint pipe from the lower side of vehicle.

B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

T: 35 N·m (3.6 kgf·m, 26.0 ft·lb)



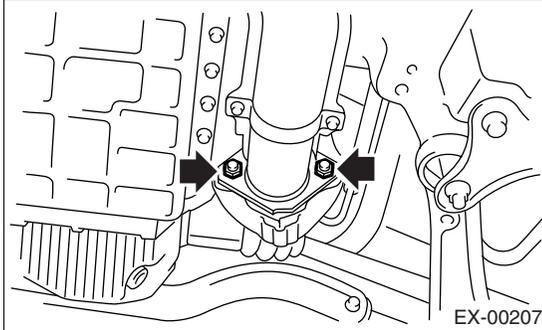
C: INSPECTION

- 1) Check the connections and welds for exhaust leaks.
- 2) Check the rear exhaust pipe for holes or rust.

5. Rear Exhaust Pipe

A: REMOVAL

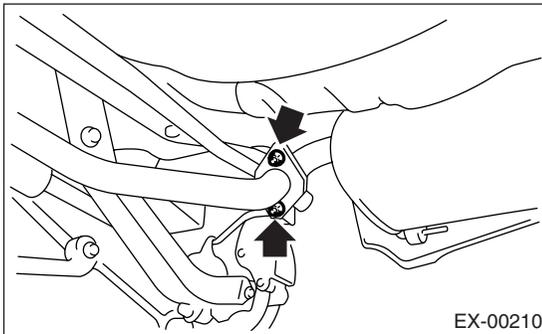
- 1) Lift-up the vehicle.
- 2) Separate the rear exhaust pipe from center exhaust pipe.



- 3) Separate the rear exhaust pipe from both mufflers.

CAUTION:

Be careful not to pull down the rear exhaust pipe.



- 4) Remove the rear exhaust pipe.

B: INSTALLATION

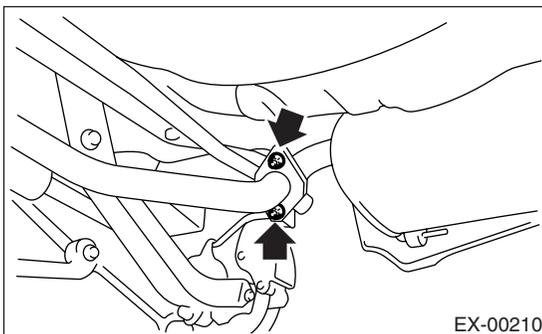
NOTE:

Use a new gasket.

- 1) Install the rear exhaust pipe to both mufflers.

Tightening torque:

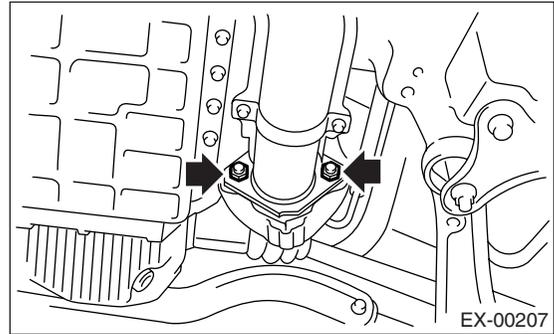
48 N·m (4.9 kgf-m, 35.4 ft-lb)



- 2) Install the rear exhaust pipe to center exhaust pipe.

Tightening torque:

35 N·m (3.6 kgf-m, 26.0 ft-lb)



- 3) Lower the vehicle.

C: INSPECTION

- 1) Check the connections and welds for exhaust leaks.
- 2) Check the rear exhaust pipe for holes or rust.
- 3) Check the cushion rubber for wear or crack.

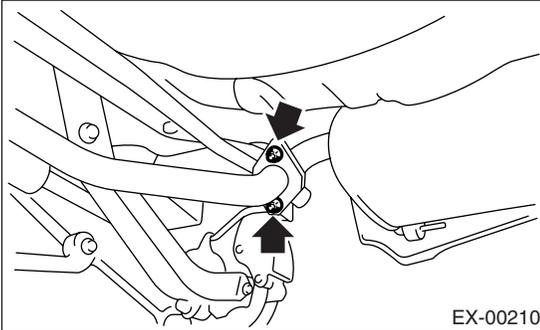
Muffler

EXHAUST

6. Muffler

A: REMOVAL

1) Separate the muffler (RH) from rear exhaust pipe.



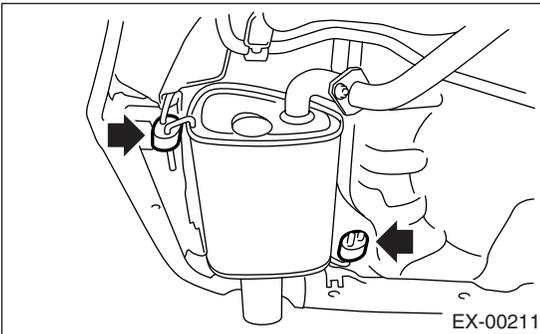
2) Remove the cushion rubbers, and detach the muffler.

CAUTION:

Be careful not to drop the muffler during removal.

NOTE:

To facilitate removal, apply a coat of spray type lubricant to the mating area of cushion rubbers in advance.



3) Perform the same procedure for muffler (LH).

B: INSTALLATION

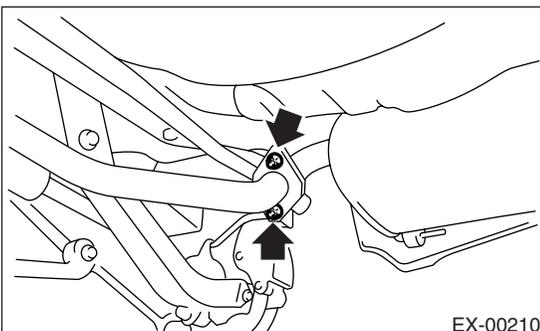
Install in the reverse order of removal.

NOTE:

Always use a new gasket and self-locking nuts.

Tightening torque:

48 N·m (4.9 kgf·m, 35.4 ft·lb)



C: INSPECTION

- 1) Check the connections and welds for exhaust leaks.
- 2) Check the mufflers for holes or rust.
- 3) Check the cushion rubber for wear or crack.