
GROUP 15

INTAKE AND EXHAUST

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SERVICE SPECIFICATIONS

M1151000302220

Item	Standard value	Limit
Exhaust manifold distortion of the installation surface mm	–	0.70

SPECIAL TOOL

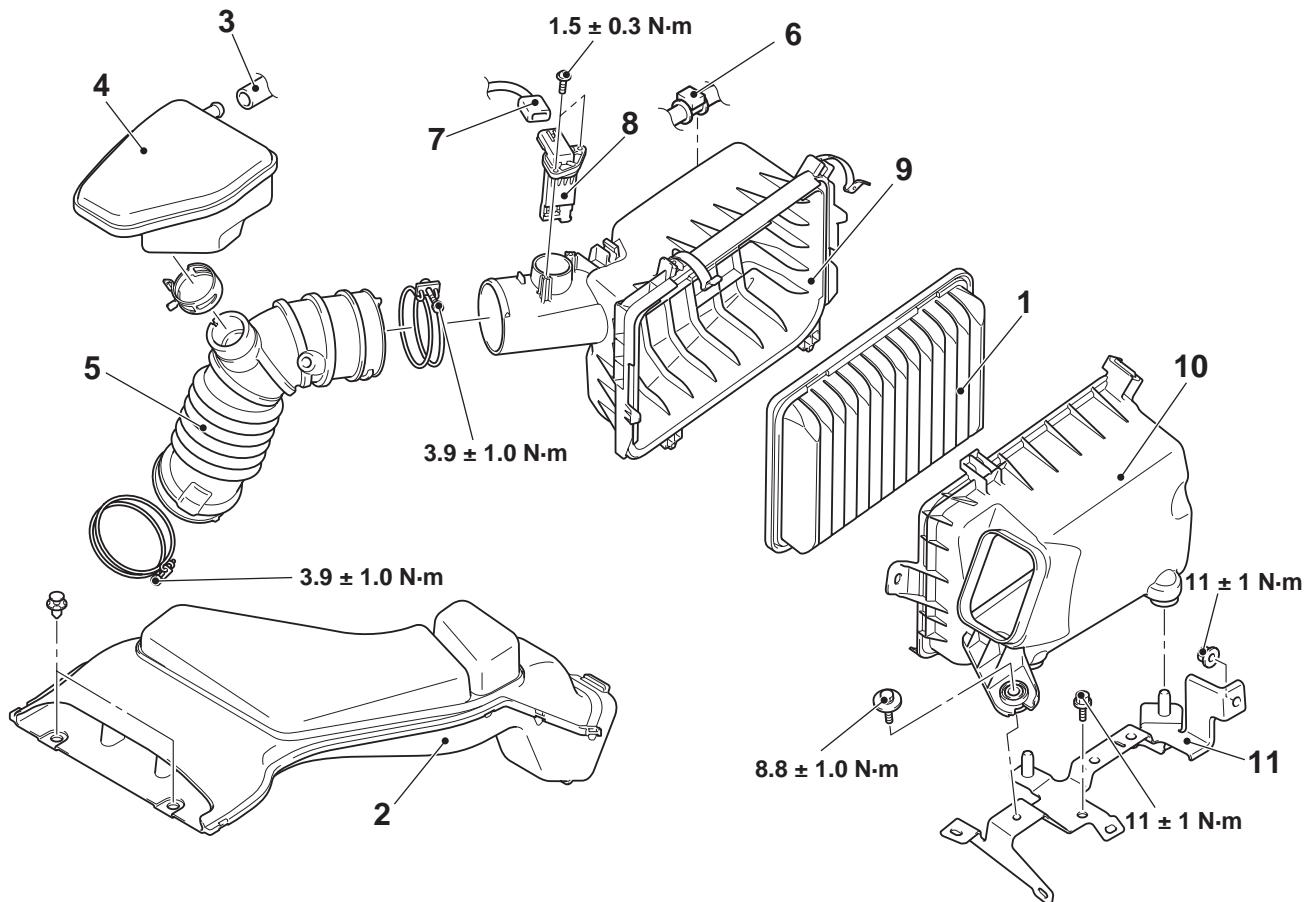
M1151000601905

Tool	Number	Name	Use
 B991953	MB991953	Oxygen sensor wrench	Removal and installation of oxygen sensor

AIR CLEANER

REMOVAL AND INSTALLATION

M1151002103537



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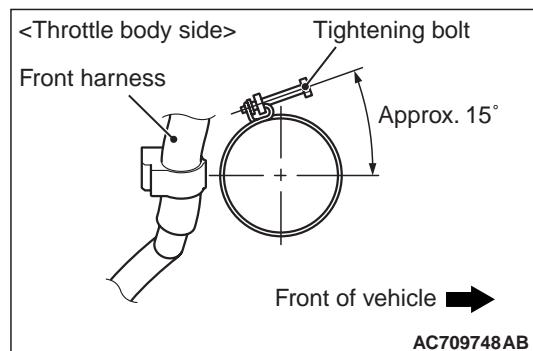
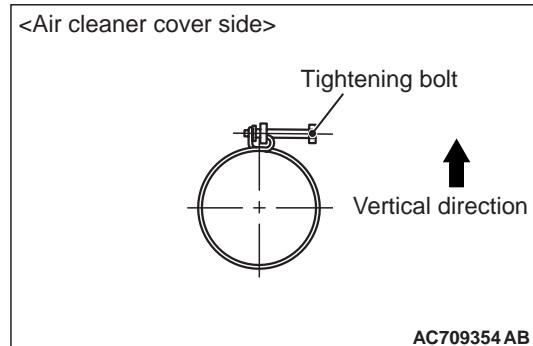
>>A<<

Removal steps

1. Air cleaner element
2. Air cleaner intake duct
3. Breather hose connection
4. Air cleaner resonator
5. Air cleaner intake hose
6. Vacuum hose connection
7. Air flow sensor connector connection
8. Air flow sensor
9. Air cleaner cover
10. Air cleaner body
- Engine-ECU (Refer to GROUP 13A – Engine-ECU).
11. Air cleaner bracket

INSTALLATION SERVICE POINT

>>A<< AIR CLEANER INTAKE HOSE INSTALLATION



1. Install the hose clamps with the tightening bolt at the position shown in the figure.
2. Check that the tip of tightening bolt does not interfere with the surrounding components.

INLET MANIFOLD

REMOVAL AND INSTALLATION

M1151003004796

CAUTION

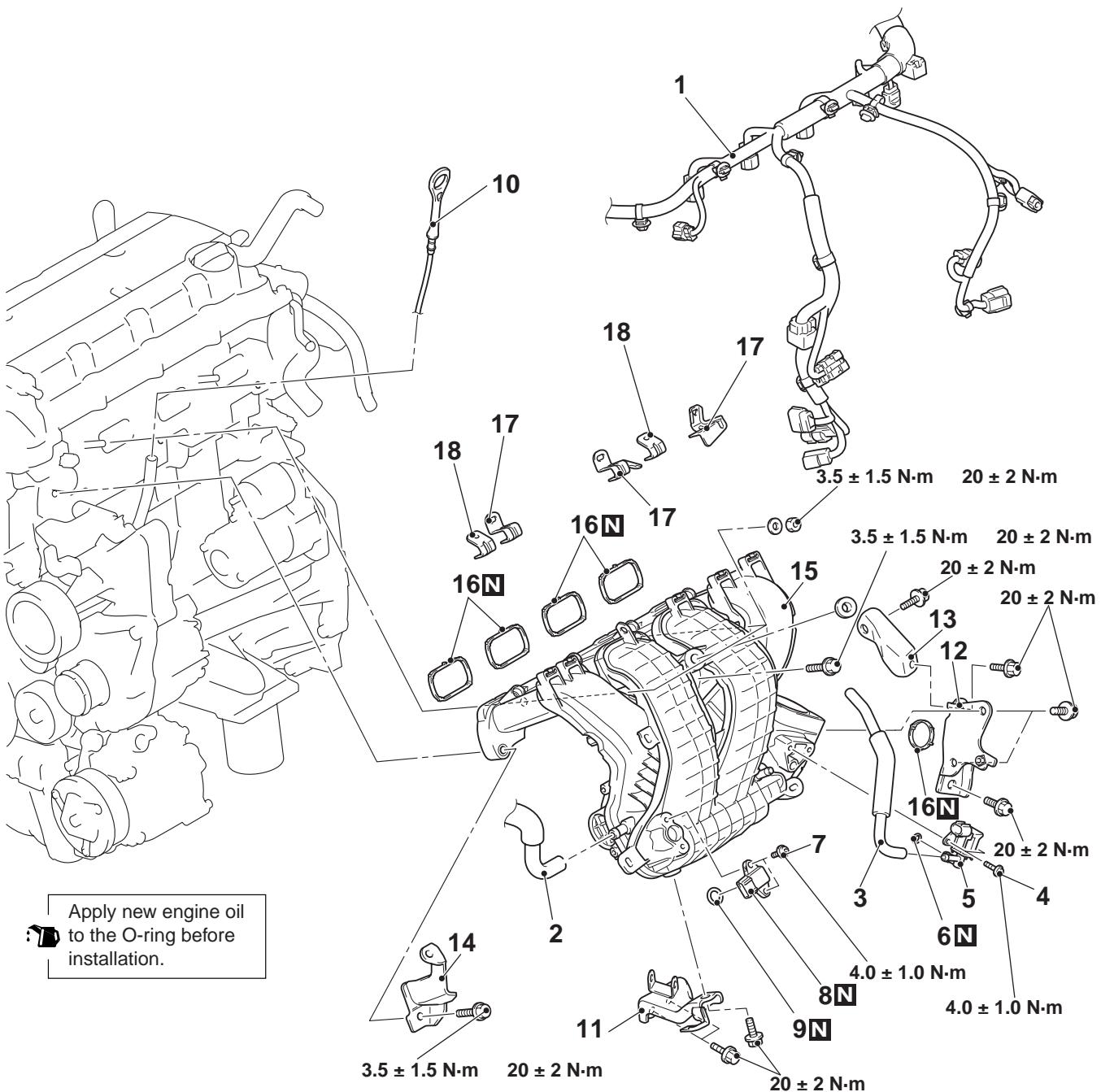
- When removing or installing the manifold absolute pressure sensor, be careful not to apply impact to the sensor.
- Do not reuse the manifold absolute pressure sensor that has been dropped.

Pre-removal operation

- Engine Coolant Draining (Refer to GROUP 14 – On-vehicle Service, Engine Coolant Replacement).
- Brake Booster Vacuum Hose Removal (Refer to GROUP 35A – Master Cylinder Assembly and Brake Booster).
- Engine Upper Cover Removal (Refer to GROUP 11A – Camshaft).
- Alternator and Others Belt Removal (Refer to GROUP 11A – Crankshaft Pulley).
- Air Cleaner Intake Hose and Air Cleaner Assembly Removal (Refer to [P.15-2](#)).
- Throttle Body Assembly Removal (Refer to GROUP 13A – Throttle Body Assembly).
- Fuel Injector Removal (Refer to GROUP 13A – Injector).

Post-installation operation

- Fuel Injector Installation (Refer to GROUP 13A – Injector).
- Throttle Body Assembly Installation (Refer to GROUP 13A – Throttle Body Assembly).
- Air Cleaner Intake Hose and Air Cleaner Assembly Installation (Refer to [P.15-2](#)).
- Alternator and Others Belt Installation (Refer to GROUP 11A – Crankshaft Pulley).
- Engine Upper Cover Installation (Refer to GROUP 11A – Camshaft).
- Engine Coolant Refilling (Refer to GROUP 14 – On-vehicle Service, Engine Coolant Replacement).



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Removal steps

1. Control wiring harness connection
2. Rocker cover PCV hose connection
3. Emission vacuum hose
- >>D<< 4. Screw
- >>D<< 5. Purge control solenoid valve
- >>D<< 6. O-ring
- >>D<< 7. Screw
- >>C<< 8. Manifold absolute pressure sensor
- >>C<< 9. O-ring

Removal steps (Continued)

10. Engine oil level gauge
- >>B<< 11. Inlet manifold stay
- >>B<< 12. Inlet manifold stay
- >>B<< 13. Inlet manifold stay
- >>A<< 14. Injector protector front
- >>A<< 15. Inlet manifold
16. Inlet manifold gasket
17. Harness bracket
18. Engine upper cover bracket

INSTALLATION SERVICE POINTS**>>A<< INLET MANIFOLD ASSEMBLY/INJECTOR PROTECTOR FRONT INSTALLATION**

Install the inlet manifold assembly and the injector protector front, and tighten mounting bolts and nuts temporarily.

NOTE: The tightening of the fuel delivery pipe, the inlet manifold assembly and the injector protector front and rear has the specified order. Temporarily tighten the inlet manifold assembly and injector protector front mounting bolts and nuts (Refer to GROUP 13A – Injector).

**>>B<< INLET MANIFOLD STAY
INSTALLATION**

Make sure that the inlet manifold stay is in intimate contact with the inlet manifold and cylinder block boss before tightening it to the specified torque of 20 ± 2 N·m.

**>>C<< MANIFOLD ABSOLUTE
PRESSURE SENSOR INSTALLATION****⚠ CAUTION**

- Install the manifold absolute pressure sensor, taking care not to give a shock to it.
- Do not use a manifold absolute pressure sensor that has fallen down.

>>D<< SCREW INSTALLATION**⚠ CAUTION**

Do not over-tighten. As the self-forming-type screw is used, the excessive torque can damage the inlet manifold threads.

INSPECTION

M1151003101545

INLET MANIFOLD CHECK

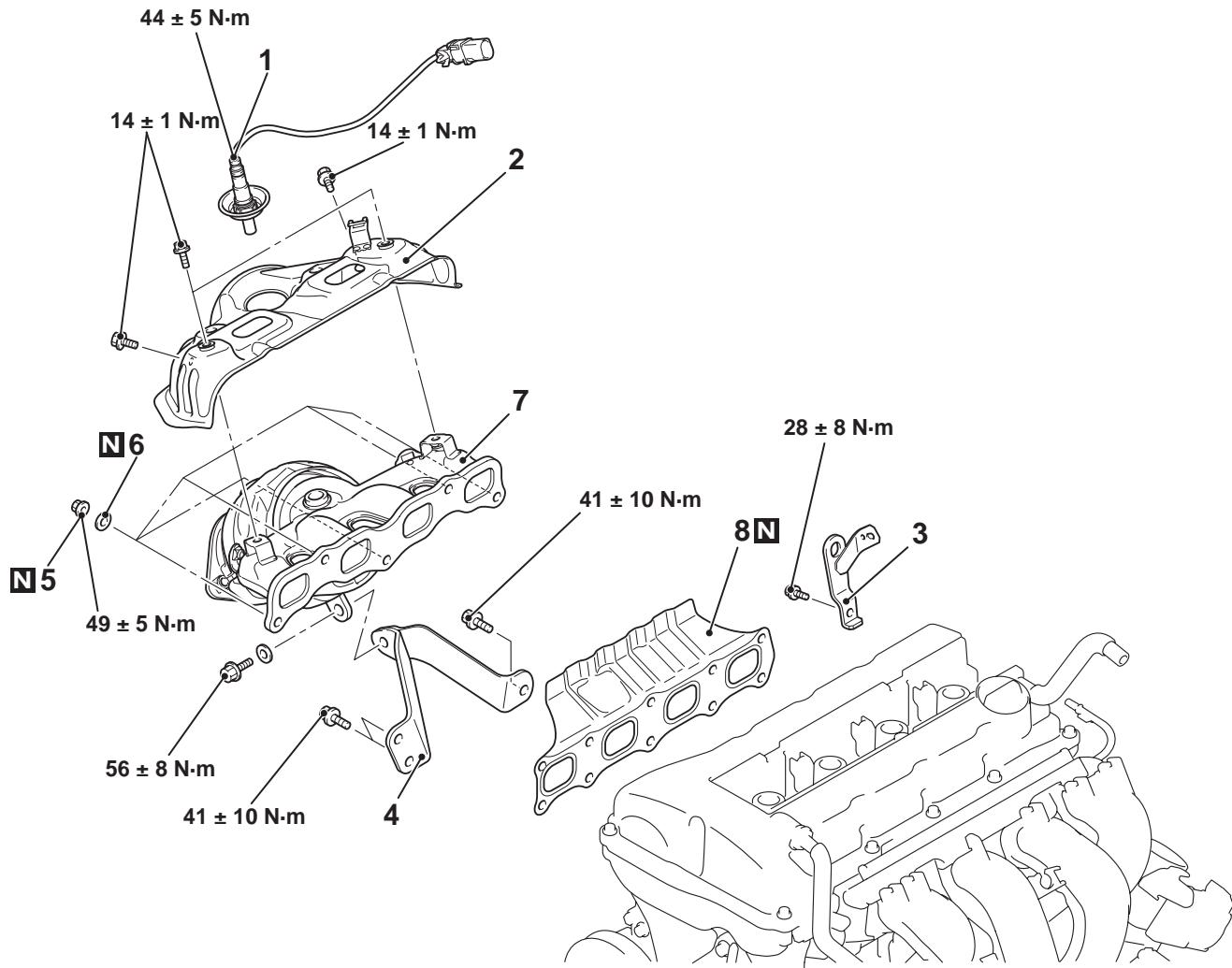
1. Check the inlet manifold for damage and cracks, and replace it if necessary.
2. Check the vacuum outlet port for clogging, and clean it if necessary.

EXHAUST MANIFOLD

REMOVAL AND INSTALLATION

M1151003303192

Pre-removal Operation	Post-installation Operation
<ul style="list-style-type: none"> Front Exhaust Pipe Removal (Refer to P.15-8). 	<ul style="list-style-type: none"> Front Exhaust Pipe Installation (Refer to P.15-8).



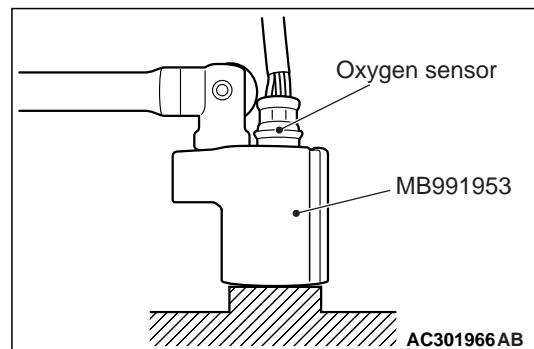
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1.	Removal steps
1.	Oxygen sensor
2.	Exhaust manifold cover
3.	Engine hanger
4.	Exhaust manifold bracket
5.	Exhaust manifold nut
6.	Exhaust manifold washer
7.	Exhaust manifold
8.	Exhaust manifold gasket

REMOVAL SERVICE POINTS

<<A>> OXYGEN SENSOR REMOVAL



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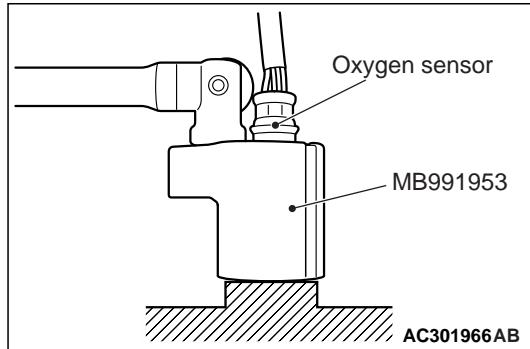
Remove the connection and clamp of oxygen sensor connector, and then use special tool oxygen sensor wrench (MB991953) to remove the oxygen sensor.

INSTALLATION SERVICE POINTS

>>A<< OXYGEN SENSOR INSTALLATION

CAUTION

- Do not use a sensor that has fallen down.



Tighten the oxygen sensor to the specified torque by using special tool oxygen sensor wrench (MB991953).

Tightening torque: $44 \pm 5 \text{ N}\cdot\text{m}$

INSPECTION

M1151003401580

EXHAUST MANIFOLD CHECK

1. Check the exhaust manifold for damage and cracks, and replace it if necessary.
2. Using a straight edge and a thickness gauge, check for distortion of the cylinder head installation surface. If it exceeds the limit value, replace it.

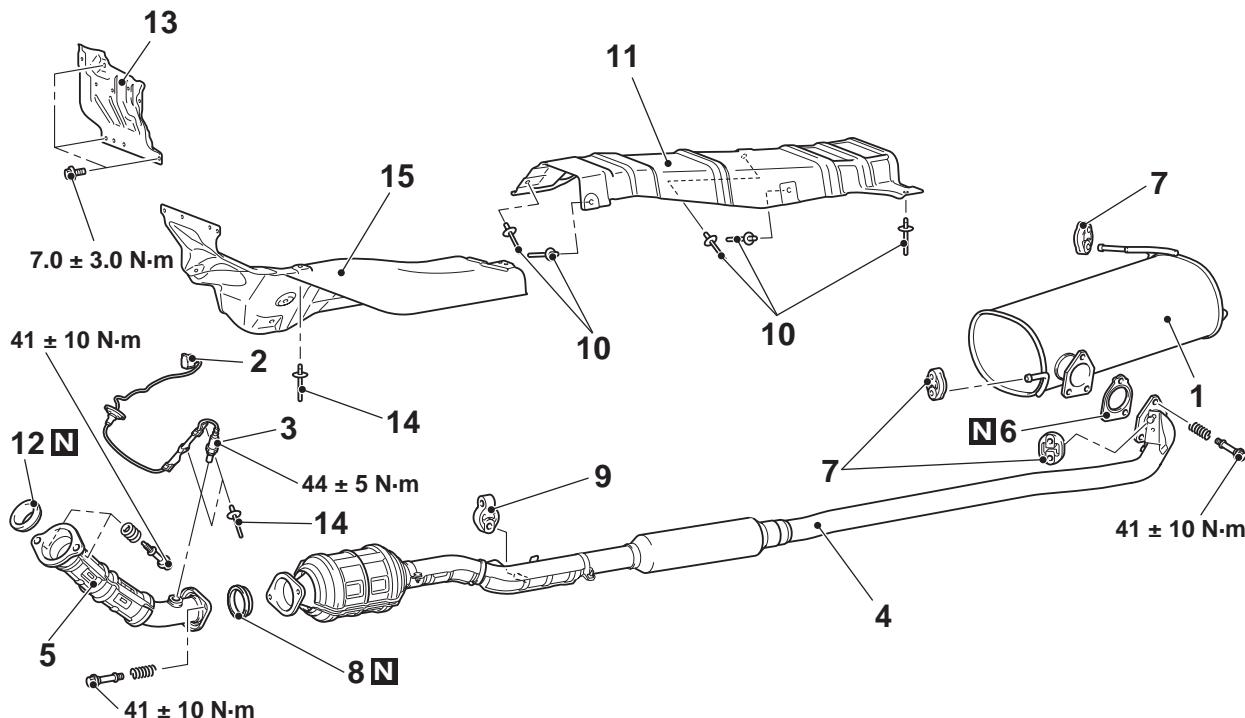
Limit: 0.70 mm

EXHAUST PIPE AND MAIN MUFFLER

REMOVAL AND INSTALLATION

M1151008703623

<2WD>



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Exhaust main muffler removal steps

1. Exhaust main muffler
6. Gasket
7. Exhaust muffler hanger

Centre exhaust pipe and front floor panel rear heat protector removal steps

- Footrest
- Lower side cover (Refer to GROUP 52A – Front Floor Console Assembly).
- Turn up the driver's side floor carpet.

Centre exhaust pipe and front floor panel rear heat protector removal steps (Continued)

9. Exhaust muffler hanger
10. Rivet
11. Front floor panel rear heat protector

Front exhaust pipe and front floor panel front heat protector removal steps

5. Front exhaust pipe
8. Seal ring
12. Seal ring
13. Dash panel heat protector
14. Rivet
15. Front floor panel front heat protector

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1. Exhaust main muffler

2. Oxygen sensor connector

3. Oxygen sensor

4. Centre exhaust pipe

5. Seal ring

6. Gasket

7. Exhaust muffler hanger

8. Seal ring

9. Exhaust muffler hanger

10. Rivet

11. Front floor panel rear heat protector

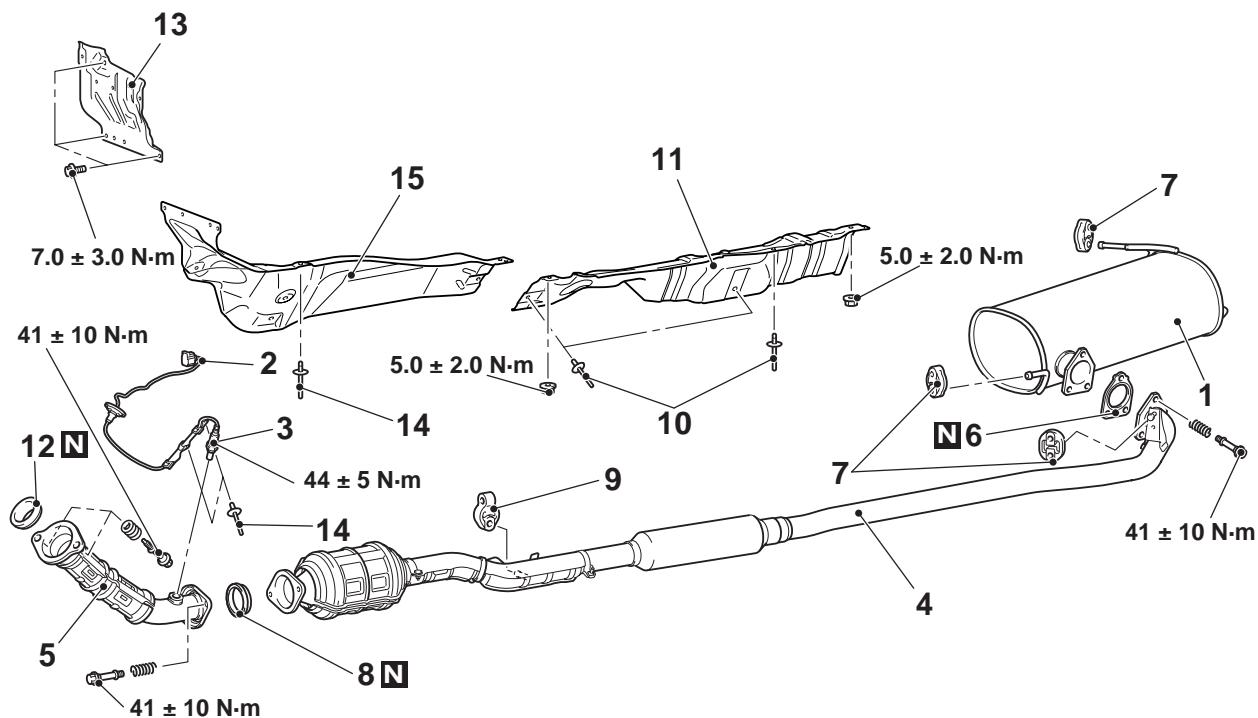
12. Seal ring

13. Dash panel heat protector

14. Rivet

15. Front floor panel front heat protector

<4WD>



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Exhaust main muffler removal steps

1. Exhaust main muffler
6. Gasket
7. Exhaust muffler hanger

Centre exhaust pipe and front floor panel rear heat protector removal steps

- Footrest
- Lower side cover (Refer to GROUP 52A – Front Floor Console Assembly).

Centre exhaust pipe and front floor panel rear heat protector removal steps (Continued)

9. Exhaust muffler hanger
10. Rivet
11. Front floor panel rear heat protector

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Front exhaust pipe and front floor panel front heat protector removal steps

5. Front exhaust pipe
8. Seal ring
12. Seal ring
13. Dash panel heat protector
14. Rivet
15. Front floor panel front heat protector

Centre exhaust pipe and front floor panel rear heat protector removal steps (Continued)

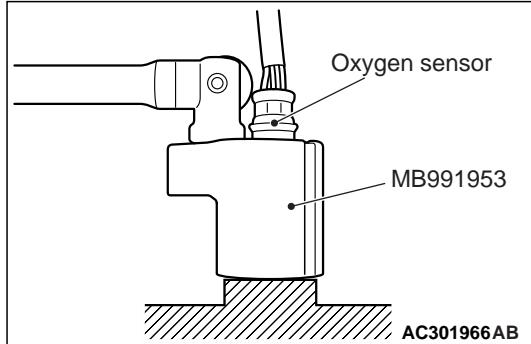
- Turn up the driver's side floor carpet.
- 2. Oxygen sensor connector
- 3. Oxygen sensor
- 4. Centre exhaust pipe
- 8. Seal ring
- 9. Exhaust muffler hanger

Centre exhaust pipe and front
floor panel rear heat protector
removal steps (Continued)

<> >>A<< 10. Rivet
 <> >>A<< 11. Front floor panel rear heat
protector
**Front exhaust pipe and front
floor panel front heat protector
removal steps**
 5. Front exhaust pipe
 8. Seal ring
 12. Seal ring
 13. Dash panel heat protector
<> >>A<< 14. Rivet
<> >>A<< 15. Front floor panel front heat
protector

REMOVAL SERVICE POINTS

<<A>> OXYGEN SENSOR REMOVAL

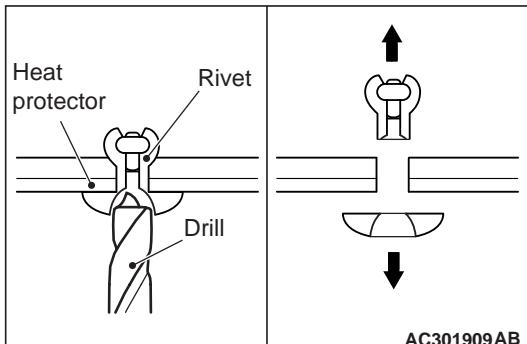


Remove the connection and clamp of oxygen sensor connector, and then use special tool oxygen sensor wrench (MB991953) to remove the oxygen sensor.

<> RIVET REMOVAL

CAUTION

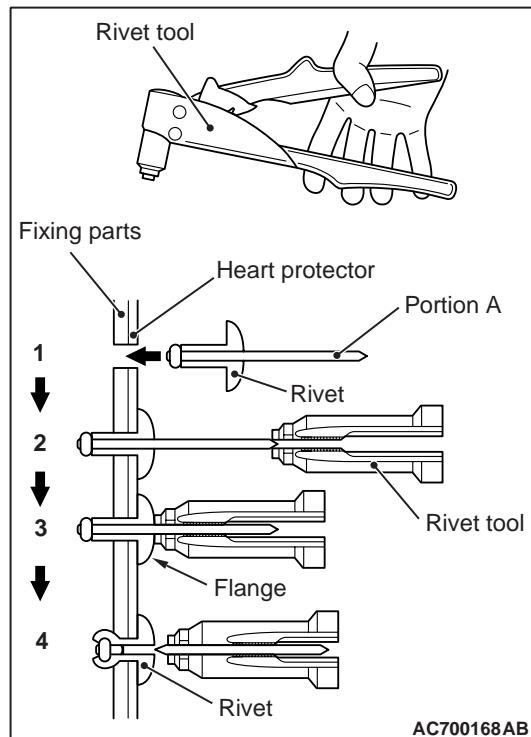
Be careful not to damage the heat protector with the drill.



Use a drill (6.0 mm) to make a hole in the rivet to break it, and then remove the rivet.

INSTALLATION SERVICE POINTS

>>A<< RIVET INSTALLATION



AC700168AB

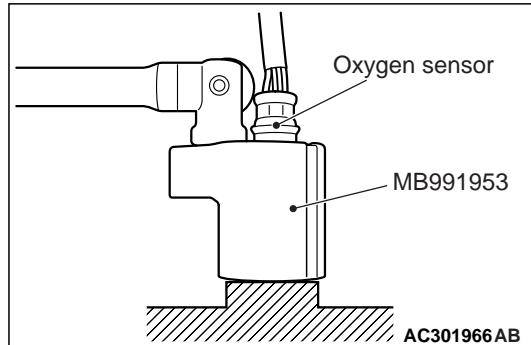
Use a rivet tool shown in the illustration to connect the parts with rivets by the following procedures.

1. Insert the rivet into a corresponding location.
2. Set the rivet tool at a portion A of rivet.
3. While pushing the flange surface of the rivet onto parts to be fixed with the rivet tool, press the handle of the tool.
4. Thin part of portion A of the rivet will be cut off and the parts is fixed in position.

>>B<< OXYGEN SENSOR INSTALLATION

CAUTION

- Do not use a sensor that has fallen down.



Tighten the oxygen sensor to the specified torque by using special tool oxygen sensor wrench (MB991953).

Tightening torque: $44 \pm 5 \text{ N}\cdot\text{m}$