
GROUP 15

INTAKE AND EXHAUST

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GENERAL INFORMATION

The exhaust pipe is divided into three parts.

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SERVICE SPECIFICATION

M1151000300525

Item	Standard value	Limit
Manifold distortion of the installation surface mm	0.15 or less	0.20

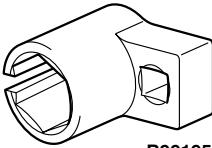
SEALANT

M1151000500228

Item	Specified sealant
Thermostat case assembly	MITSUBISHI GENUINE Part No.MD970389 or equivalent
Thermostat case assembly bolt	3M Stud Locking 4170 or equivalent

SPECIAL TOOL

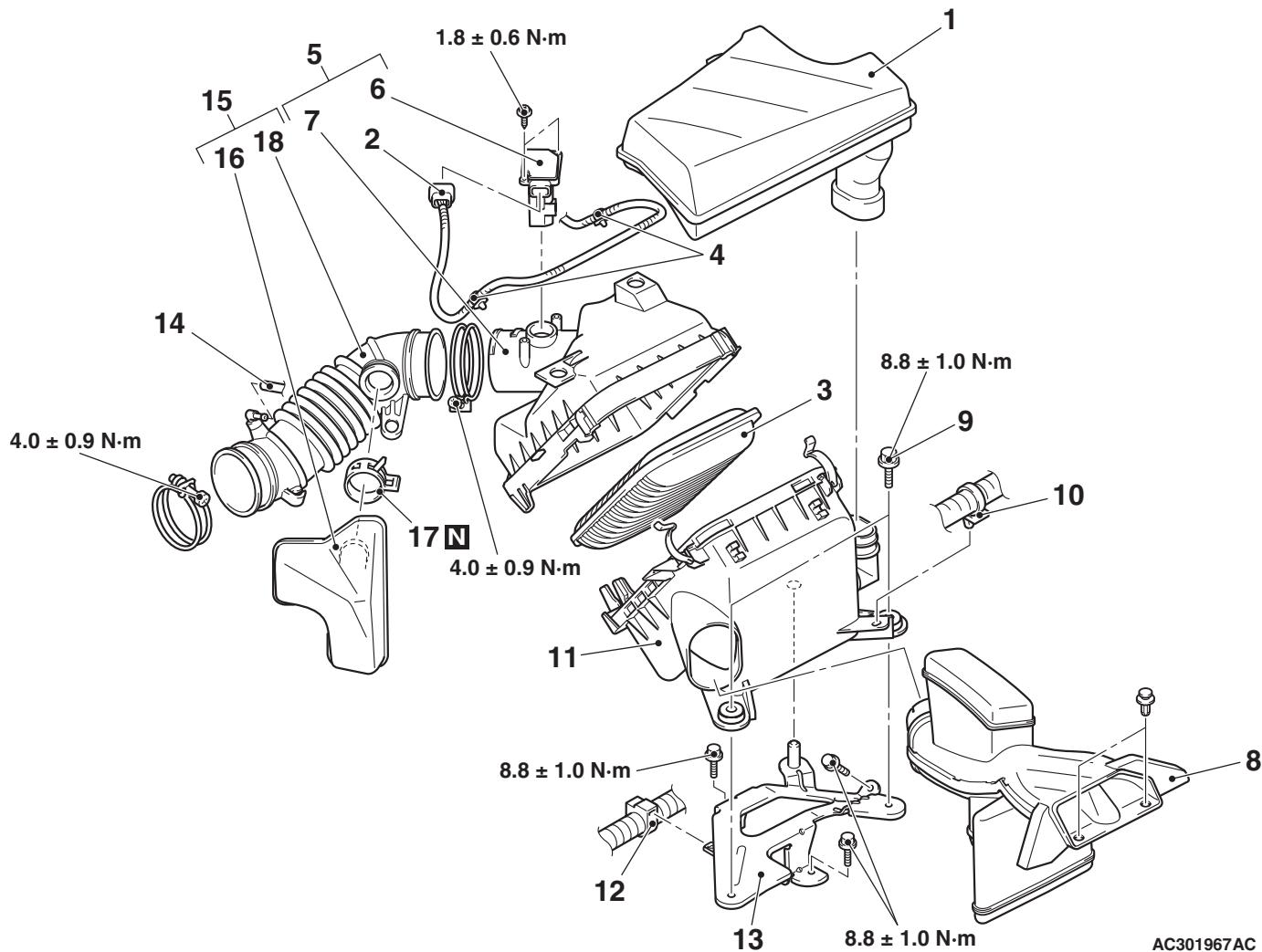
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Tool	Number	Name	Use
 B991953	MB991953	Oxygen sensor wrench	Removal and installation of oxygen sensor

AIR CLEANER

REMOVAL AND INSTALLATION

M1151002100602



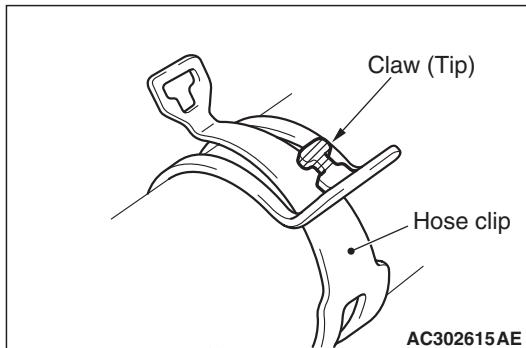
Removal steps

1. Air cleaner resonator
2. Air cleaner air flow sensor connector
3. Air cleaner element
4. Harness clamp
5. Air cleaner air flow sensor and air cleaner cover assembly
6. Air cleaner air flow sensor assembly
7. Air cleaner cover
8. Air cleaner intake duct
9. Air cleaner body assembly bolts
- Battery terminal connection

<<A>> >>A<<

Removal steps (Continued)

10. Harness clamp
11. Air cleaner body assembly
12. Harness clamp
13. Air cleaner bracket
14. Breather hose connection
- Engine cover (Refer to GROUP 11A, Camshaft and valve stem seal P.11A-16.)
15. Air cleaner resonator and air intake hose assembly
16. Air cleaner resonator
17. Hose clip
18. Air intake hose

REMOVAL SERVICE POINT
<<A>> AIR CLEANER
RESONATOR/HOSE CLIP REMOVAL

Break off the tip of hose clip claw and spread out the hose clip, then remove the air cleaner resonator.

NOTE: If there is a hose clip claw, the hose clip cannot spread to capacity.

INSTALLATION SERVICE POINT
>>A<< HOSE CLIP/AIR CLEANER
RESONATOR INSTALLATION**CAUTION**

Never reuse the hose clip whose claw is broken off to prevent the rusting.

1. Insert a new hose clip into the air intake hose.
2. Install the air cleaner resonator to the air intake hose.
3. Remove the hose clip claw and shorten the hose clip, then install the air cleaner resonator.

INLET MANIFOLD

REMOVAL AND INSTALLATION

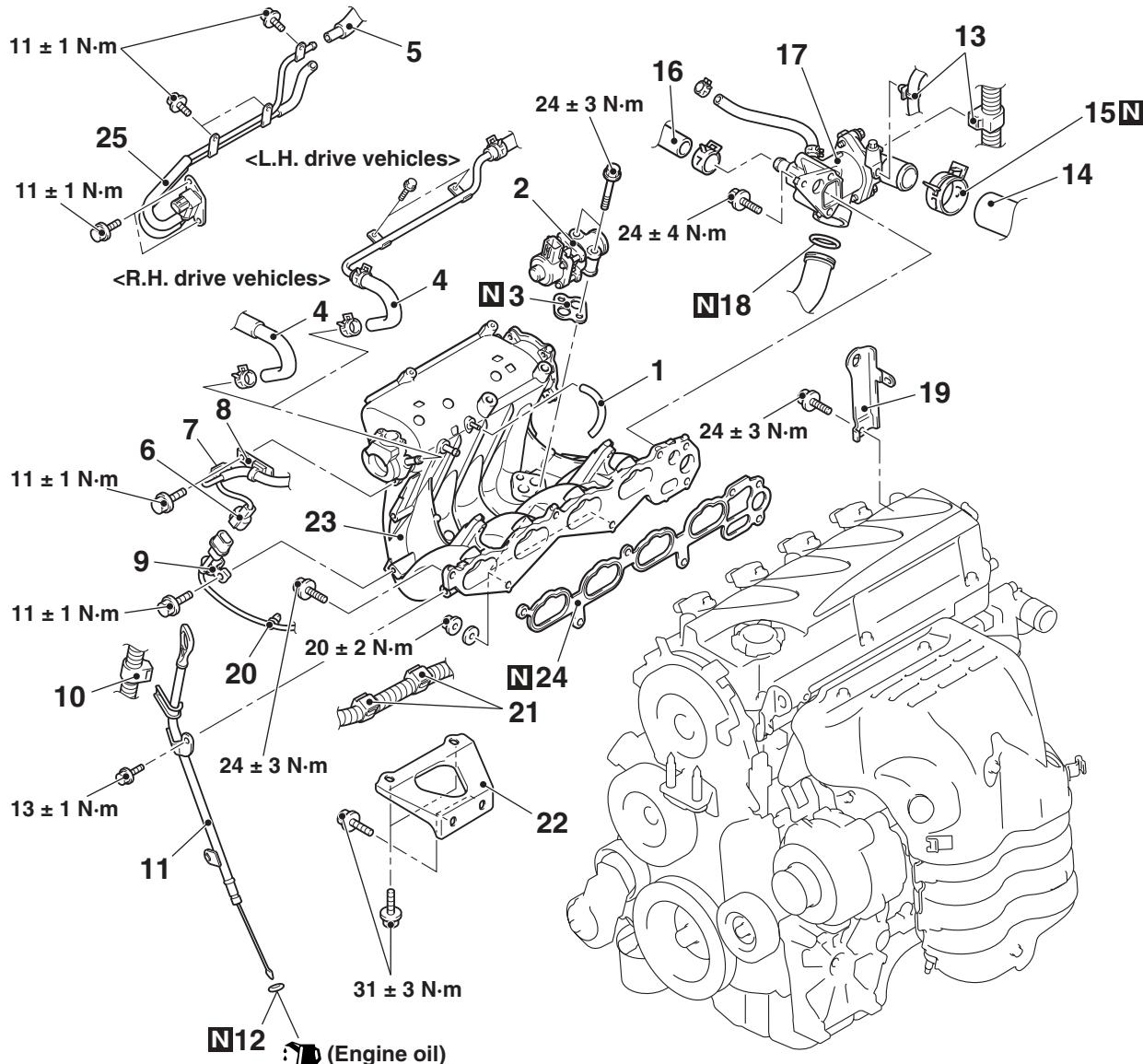
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Pre-removal Operation

- Engine Cover and Engine Cover Bracket Removal (Refer to GROUP 11A, Camshaft and Valve Stem Seal P.11A-16).
- Engine Coolant Draining (Refer to GROUP 14, On-vehicle Service – Engine Coolant Replacement P.14-17).
- Air Cleaner Assembly Removal (Refer to P.15-3).
- Cowl Top Panel Front Removal (Refer to GROUP 42, Loose Panel P.42-67).
- Throttle Body Removal (Refer to GROUP 13A, Throttle Body P.13A-397).
- Fuel Delivery Pipe and Fuel Injector Assembly Removal (Refer to GROUP 13A, Injector P.13A-395).

Post-installation Operation

- Fuel Delivery Pipe and Fuel Injector Assembly Installation (Refer to GROUP 13A, Injector P.13A-395).
- Throttle Body Installation (Refer to GROUP 13A, Throttle Body P.13A-397).
- Cowl Top Panel Front Installation (Refer to GROUP 42, Loose Panel P.42-67).
- Air Cleaner Assembly Installation (Refer to P.15-3).
- Engine Coolant Refilling (Refer to GROUP 14, On-vehicle Service – Engine Coolant Replacement P.14-17).
- Engine Cover and Engine Cover Bracket Installation (Refer to GROUP 11A, Camshaft and Valve Stem Seal P.11A-16).

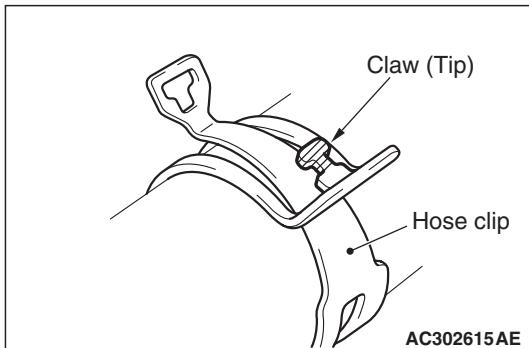


Removal steps (Continued)

6. Detonation sensor connector
7. Evaporative emission purge solenoid valve connector
8. Harness clamp
9. Detonation sensor connector clamp
10. Harness clamp
11. Oil level gauge and guide
12. O-ring
13. Harness clamp
- <<A>> >>B<< 14. Radiator lower hose connection
- <<A>> >>B<< 15. Hose clip
- >>A<< 16. Heater water hose connection
- >>A<< 17. Thermostat case assembly
18. O-ring
19. Engine hanger
20. Detonation sensor harness clamp
21. Harness clamp
22. Inlet manifold stay
23. Inlet manifold
24. Inlet manifold gasket
25. Evaporative emission purge solenoid valve, evaporative emission vacuum hose and pipe assembly

REMOVAL SERVICE POINT

<<A>> RADIATOR LOWER HOSE/HOSE CLIP REMOVAL



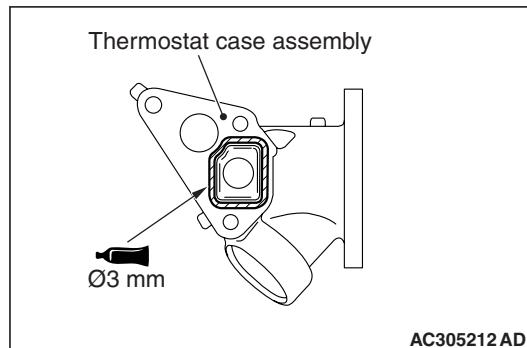
Break off the tip of hose clip claw and spread out the hose clip, then disconnect the radiator lower hose.

NOTE: If there is a hose clip claw, the hose clip cannot spread to capacity.

INSTALLATION SERVICE POINTS

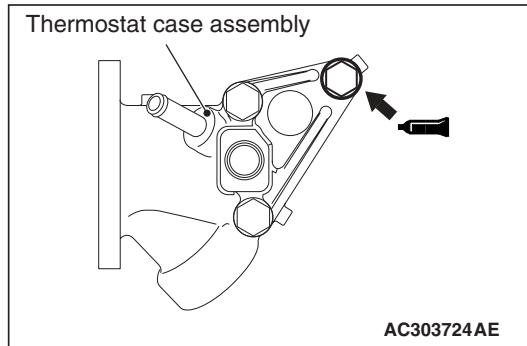
>>A<< THERMOSTAT CASE ASSEMBLY INSTALLATION

1. Use a gasket scraper or wire brush to completely eliminate all gasket material on the gasket mounting surface.



2. Apply a bead of the sealant to the cylinder head mating surface of the thermostat case assembly as shown.

Specified Sealant: MITSUBISHI GENUINE PART No.MD970389 or equivalent



3. Apply sealant to the thread of the thermostat case assembly bolts as shown.

Specified Sealant: 3M Stud Locking 4170 or equivalent

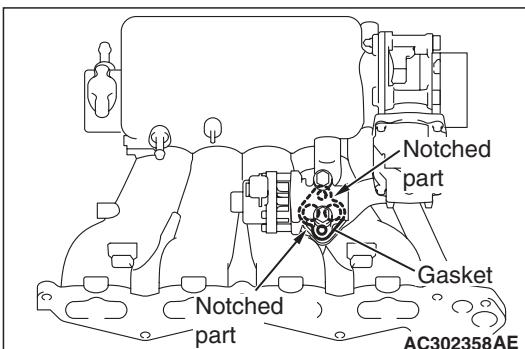
4. With the sealant still wet (within 15 minutes after the sealant is applied), install the thermostat case assembly. Do not apply the sealant in an area more than the required.

>>B<< HOSE CLIP/RADIATOR LOWER HOSE INSTALLATION

CAUTION

Never reuse the hose clip whose claw is broken off to prevent the rusting.

1. Insert a new hose clip into the radiator lower hose.
2. Insert the radiator lower hose to the protrusion of the water inlet hose fitting.
3. Remove the hose clip claw and shorten the hose clip, then install the radiator lower hose.

>>C<< EGR VALVE GASKET
INSTALLATION

Install the EGR valve gasket as shown in the illustration.

INSPECTION

M1151003100713

Check the following points; replace the part if a problem is found.

INLET MANIFOLD CHECK

1. Check for damage or cracking of any part.
2. Clogging of the negative pressure (vacuum) outlet port, or clogging of the exhaust gas recirculation passages.
3. Using a straight edge and feeler gauge, check for distortion of the cylinder head installation surface.

Standard value: 0.15 mm or less

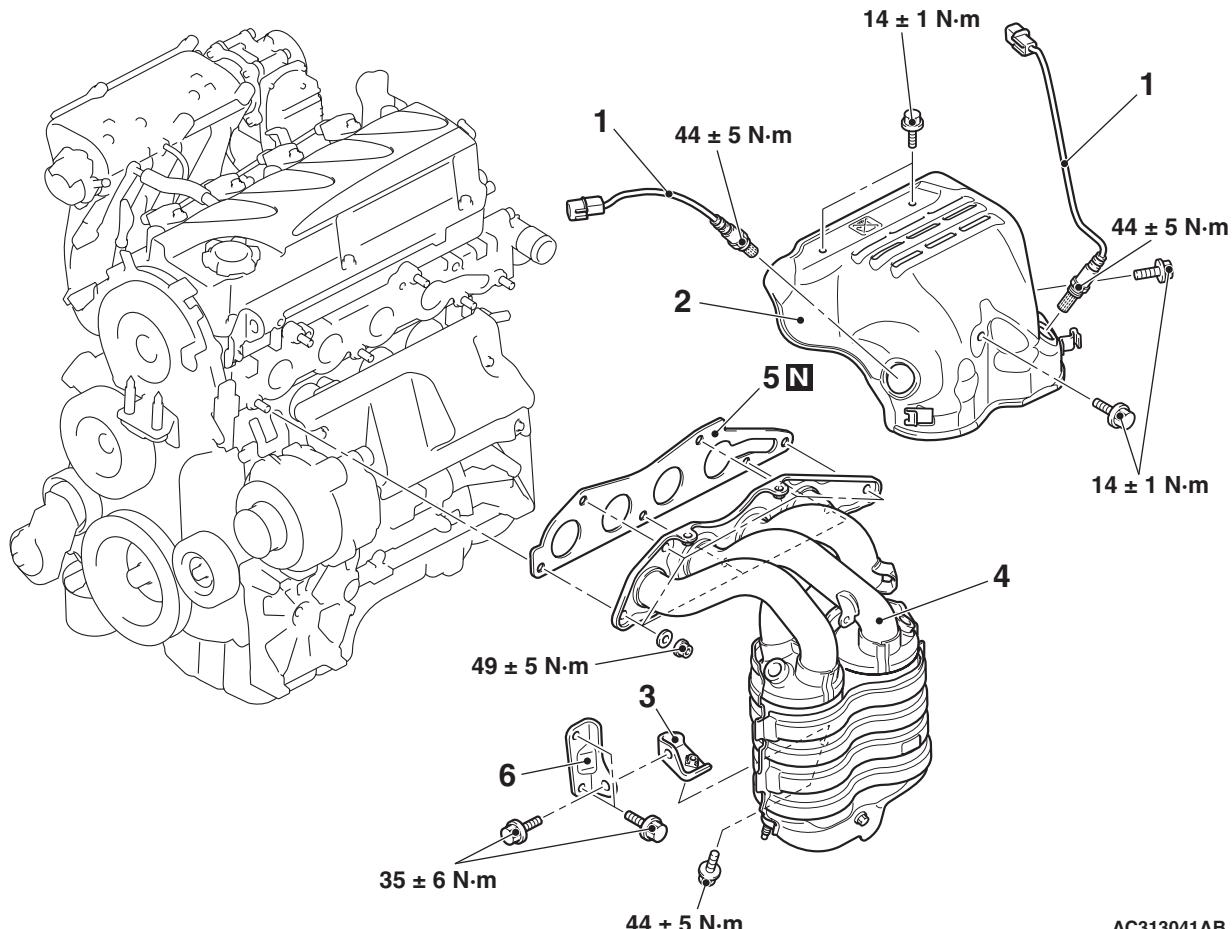
Limit: 0.20 mm

EXHAUST MANIFOLD

REMOVAL AND INSTALLATION

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Pre-removal and Post-installation Operation
Air Cleaner Intake Duct Removal and Installation (Refer to P.15-3).



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Removal steps

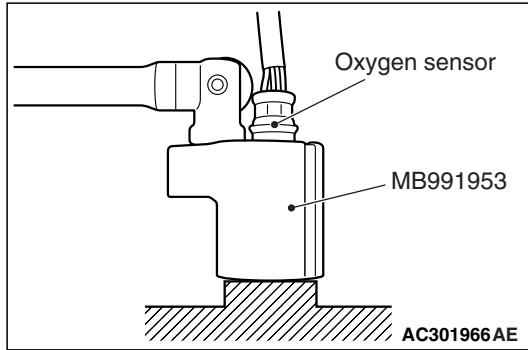
<<A>> >>A<<

1. Oxygen sensor
2. Exhaust manifold cover
- Front exhaust pipe (Refer to [P.15-9.](#))
3. Exhaust manifold bracket B
4. Exhaust manifold assembly
5. Exhaust manifold gasket
6. Exhaust manifold bracket A

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REMOVAL SERVICE POINTS

<<A>> OXYGEN SENSOR REMOVAL



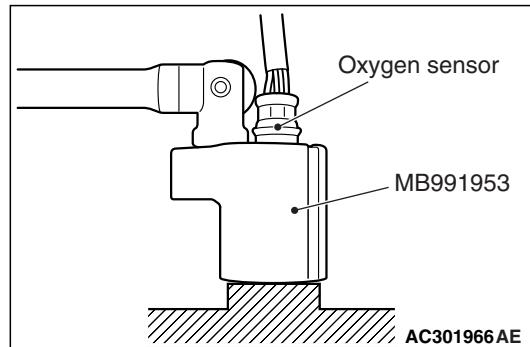
Remove the connection and clamp of oxygen sensor connector, and then use the special tool oxygen sensor wrench (MB991953) to remove the oxygen sensor.

<> FRONT EXHAUST PIPE REMOVAL

Remove the connection and clamp of oxygen sensor connector, and then remove the front exhaust pipe with the oxygen sensor.

INSTALLATION SERVICE POINT

>>A<< OXYGEN SENSOR INSTALLATION



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

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

2. Connect the oxygen sensor connector and install the connector bracket.

INSPECTION

M1151003400480

Check the following points; replace the part if a problem is found.

Exhaust Manifold Check

1. Check for damage or cracking of any part.
2. Using a straight edge and a feeler gauge, check for distortion of the cylinder head installation surface.

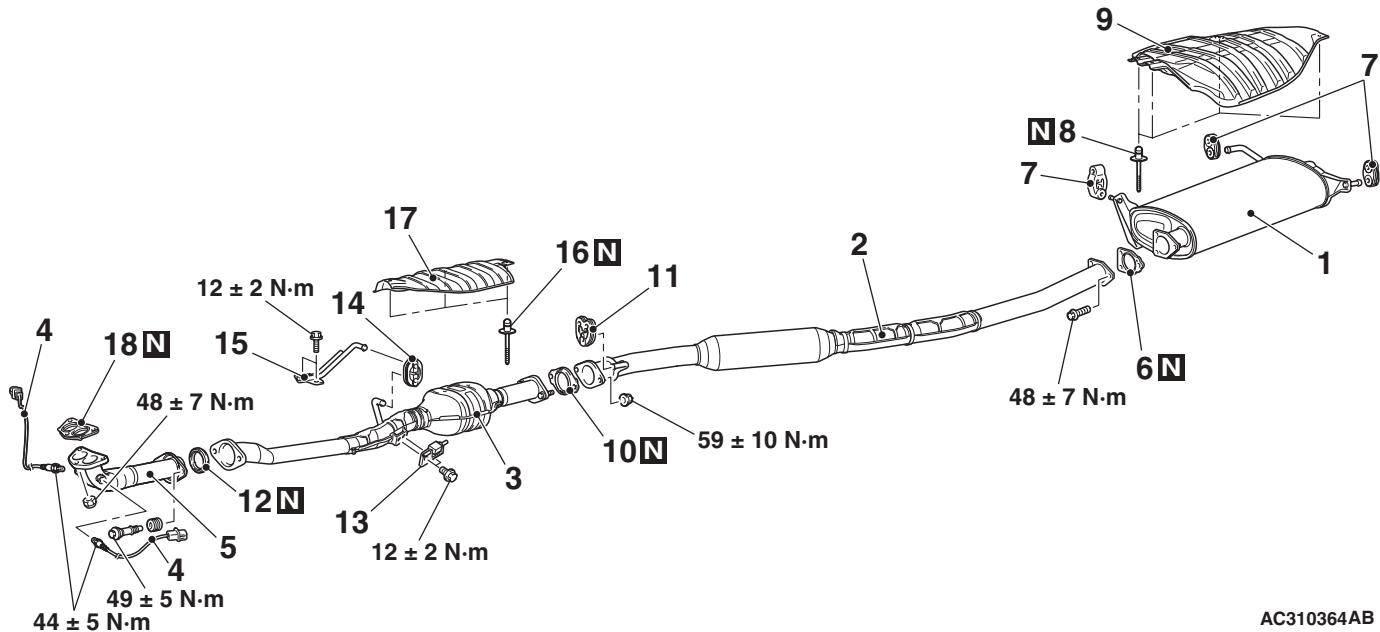
Standard value: 0.15 mm or less

Limit: 0.20 mm

EXHAUST PIPE AND MAIN MUFFLER

REMOVAL AND INSTALLATION

M1151008700408



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Exhaust main muffler and heat protector removal steps

1. Exhaust main muffler
6. Exhaust pipe gasket
7. Exhaust muffler hanger

<<A>> >>B<< 8. Rivets

<<A>> >>B<< 9. Heat protector

Centre exhaust pipe removal steps

2. Centre exhaust pipe
6. Exhaust pipe gasket
10. Exhaust pipe gasket
11. Exhaust muffler hanger

Catalytic converter and heat protector removal steps

3. Catalytic converter
10. Exhaust pipe gasket
12. Seal ring
13. Exhaust pipe damper
14. Exhaust muffler hanger
15. Exhaust pipe hanger bracket

<<A>> >>B<< 16. Rivets

<<A>> >>B<< 17. Heat protector

Front exhaust pipe removal steps

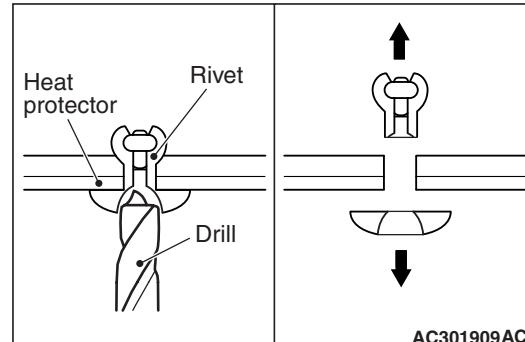
4. Oxygen sensor
5. Front exhaust pipe
12. Seal ring
18. Exhaust pipe gasket

REMOVAL SERVICE POINTS

<<A>> RIVETS/HEAT PROTECTOR REMOVAL

CAUTION

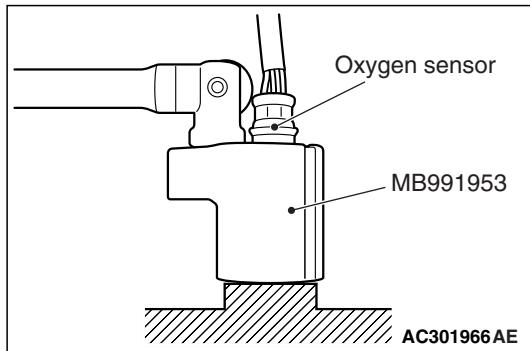
Be careful not to score the heat protector by drill.



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1. Use a 6.0 / diameter / mm drill to make a hole in the flange of rivet as shown.
2. Break the rivet, and remove the rivet and heat protector.

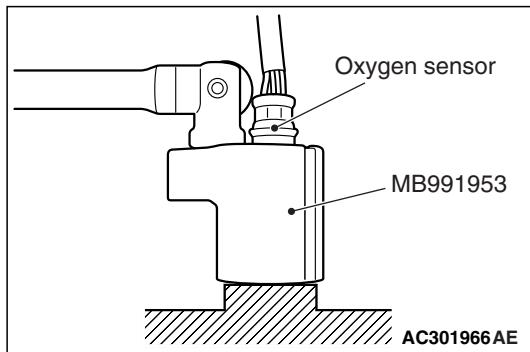
<> OXYGEN SENSOR REMOVAL



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

INSTALLATION SERVICE POINTS

>>A<< OXYGEN SENSOR INSTALLATION



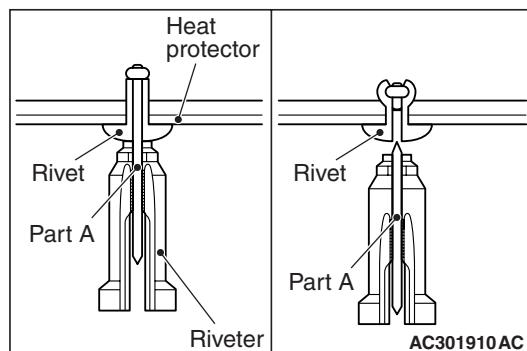
1. Tighten the oxygen sensor to the specified torque by using special tool oxygen sensor wrench (MB991953).

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

2. Connect the oxygen sensor connector and install the connector bracket.

>>B<< HEAT PROTECTOR/RIVETS
INSTALLATION

Use a riveter to tighten the rivet by the following procedure.



1. Insert part A of rivet into the riveter, and insert the rivet into the assembling area.
2. Operate the tool's handle while pushing the flange surface of rivet by riveter. Part A of rivet is cut and the rivet is tightened.