

GROUP 15

INTAKE AND EXHAUST

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GENERAL INFORMATION

M1151000100383

The exhaust pipe is divided into three parts.

SERVICE SPECIFICATIONS

M1151000300376

Item	Standard value	Limit
Turbocharger supercharging pressure (waste gate solenoid valve not operating) kPa	59 – 84	–
Initial activation pressure of waste gate actuator (at the stroke of approximately 1 mm) kPa	Approximately 80	–
Waste gate solenoid valve coil resistance (at 20°C) Ω	29 – 35	–
Initial activation pressure of air bypass valve kPa	Approximately 53	–
Manifold distortion of the installation surface mm	0.15 or less	0.20

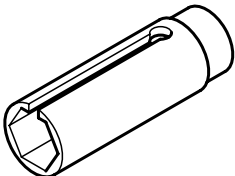
SEALANT

M1151000500314

Item	Specified sealant
Thermostat case	MITSUBISHI GENUINE PART MD970389 or equivalent
Thermostat case assembly bolt <4G69>	3M Stud Locking 4170 or equivalent

SPECIAL TOOL

M1151000600366

Tool	Number	Name	Use
	MD998770	Oxygen sensor wrench	Removal and installation of oxygen sensor

AIR CLEANER

REMOVAL AND INSTALLATION <4G64>

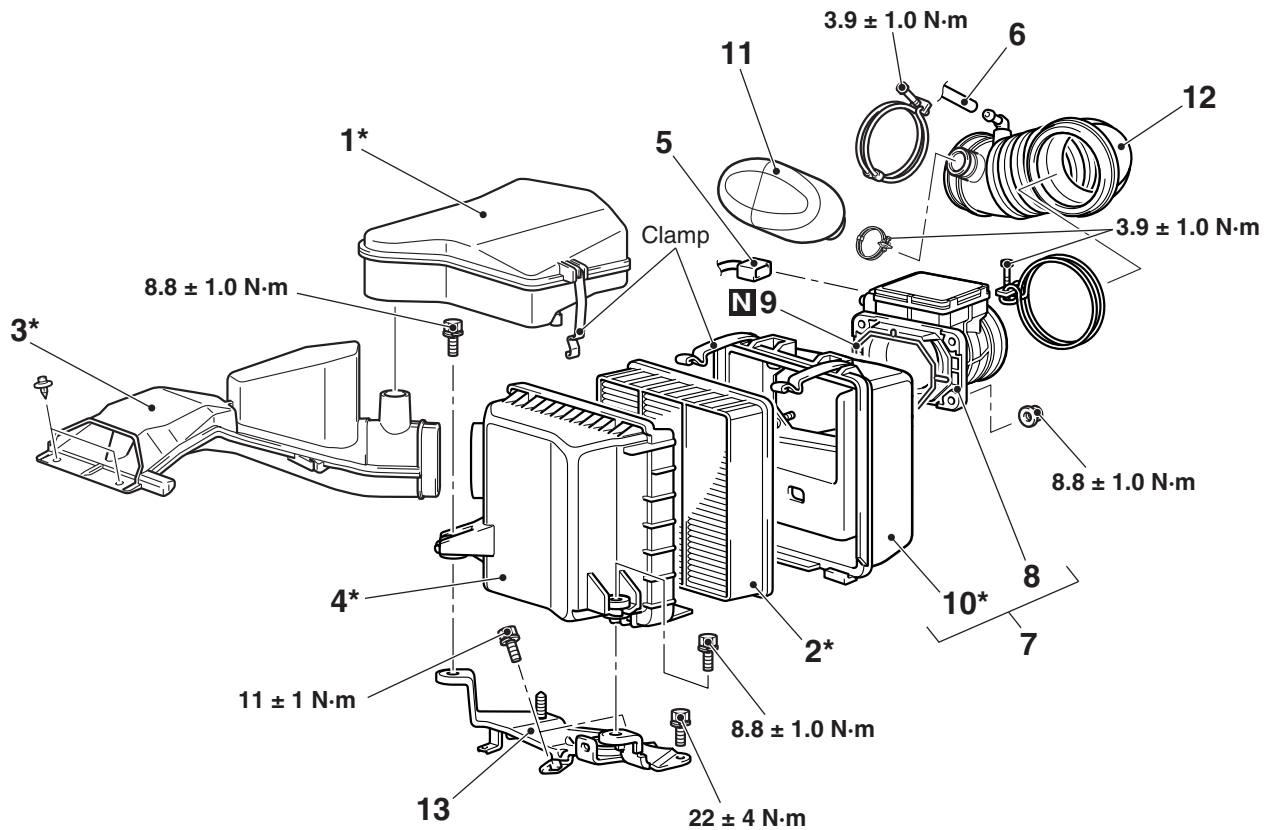
M1151002101058

CAUTION

Parts marked by * are made of recycled-paper mixed plastic material, so observe the following precautions.

- Avoid any shock or load to these parts when removing and installing them.
- When installing, securely set the air cleaner cover and the resonator clamp to the air cleaner body.

NOTE: Parts marked by * are made of recycled-paper mixed plastic material. Dispose of according to state and local laws



AC203703AB

Removal steps

1. Resonator
2. Air cleaner element
3. Air duct
4. Air cleaner body
5. Air flow sensor connector
6. Breather hose connection
7. Air cleaner cover and air flow sensor assembly

Removal steps (Continued)

8. Air flow sensor assembly
9. Gasket
10. Air cleaner cover
11. Resonator
12. Air intake hose
13. Air cleaner bracket

REMOVAL AND INSTALLATION <4G69>

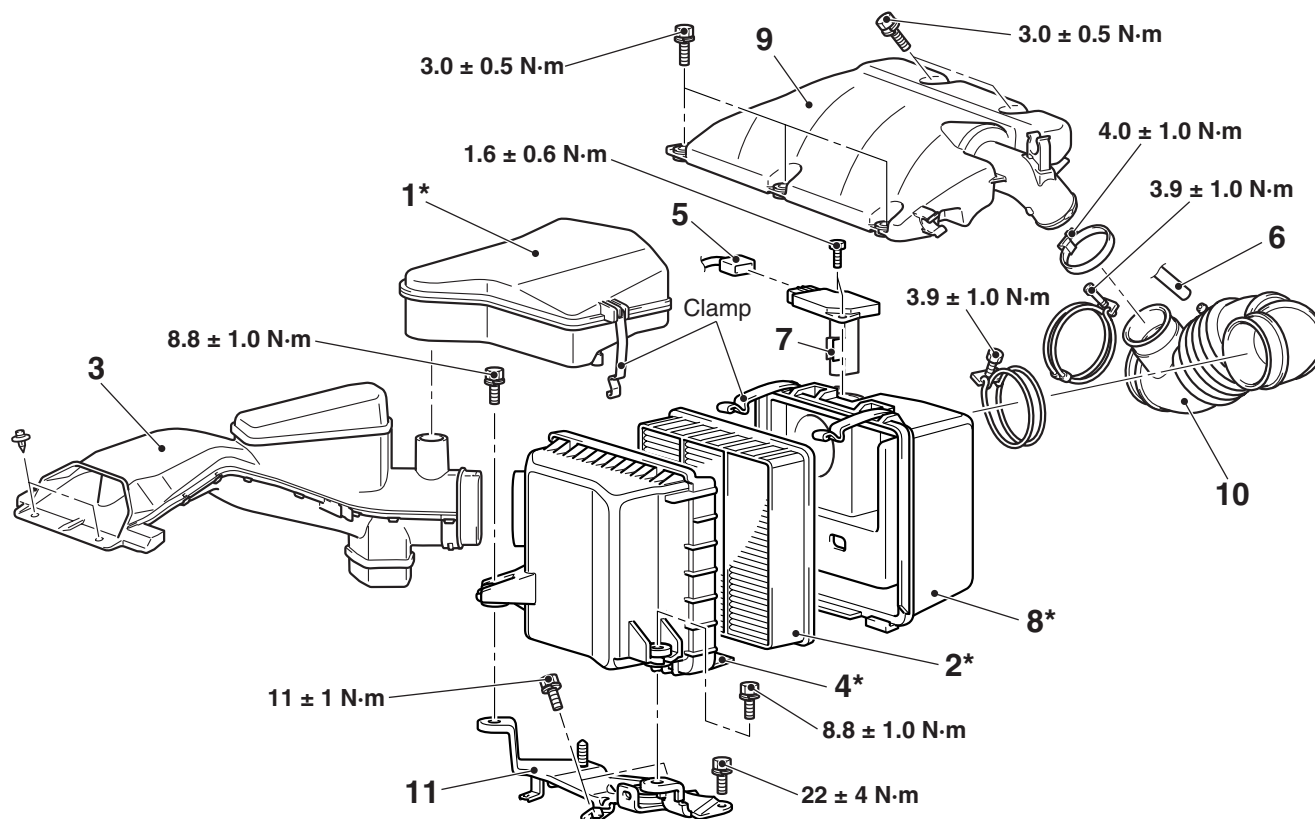
M1151002100721

CAUTION

Parts marked by * are made of recycled-paper mixed plastic material, so observe the following precautions.

- **Avoid any shock or load to these parts when removing and installing them.**
- **When installing, securely set the air cleaner cover and the resonator clamp to the air cleaner body.**

NOTE: Parts marked by * are made of recycled-paper mixed plastic material. Dispose of according to state and local laws



AC304211AC

Removal steps

1. Resonator
2. Air cleaner element
3. Air duct
4. Air cleaner body
5. Air flow sensor connector
6. Breather hose connection

Removal steps (Continued)

7. Air flow sensor assembly
8. Air cleaner cover
9. Resonator
10. Air intake hose
11. Air cleaner bracket

INLET MANIFOLD

REMOVAL AND INSTALLATION <4G64>

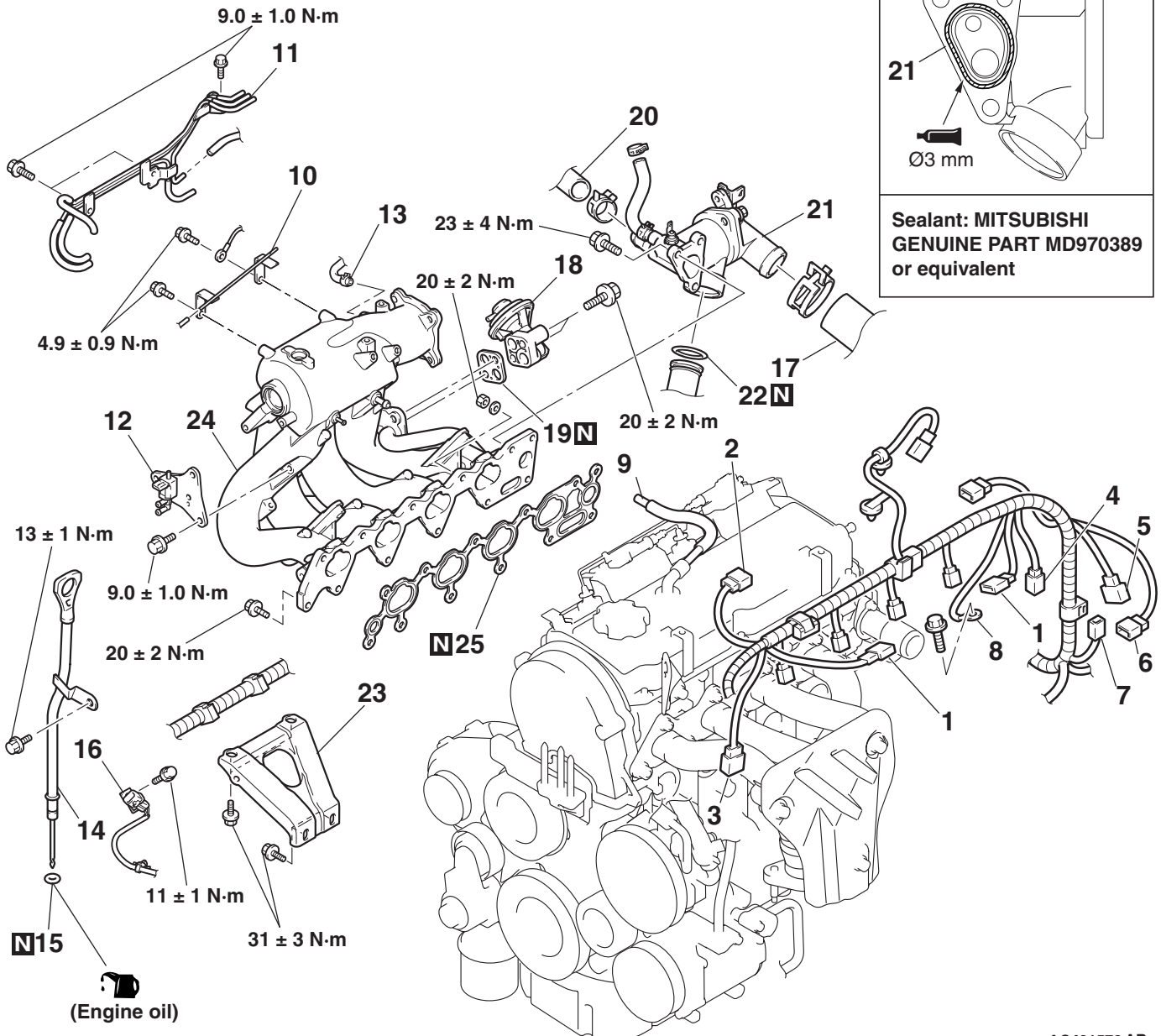
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Pre-removal Operation

- Fuel Line Pressure Reduction [Refer to GROUP 13A, On-vehicle Service – Fuel Pump Connector Disconnection (How to Reduce Pressurized Fuel Lines) [P.13A-283](#).]
- Engine Coolant Draining (Refer to GROUP 14, On-vehicle Service – Engine Coolant Replacement [P.14-10](#)).
- Air Cleaner Removal (Refer to [P.15-3](#)).
- Throttle Body Removal (Refer to GROUP 13A, Throttle Body [P.13A-294](#)).
- Fuel Pressure Regulator, Delivery Pipe and Injector Assembly Removal (Refer to GROUP 13A, Injector [P.13A-292](#)).

Post-installation Operation

- Fuel Pressure Regulator, Delivery Pipe and Injector Assembly Installation (Refer to GROUP 13A, Injector [P.13A-292](#)).
- Throttle Body Installation (Refer to GROUP 13A, Throttle Body [P.13A-294](#)).
- Air Cleaner Installation (Refer to [P.15-3](#)).
- Engine Coolant Refilling (Refer to GROUP 14, On-vehicle Service – Engine Coolant Replacement [P.14-10](#)).
- Accelerator Cable Adjustment (Refer to GROUP 17, On-vehicle Service – Accelerator Cable Check and Adjustment [P.17-7](#)).
- Fuel Leak Check



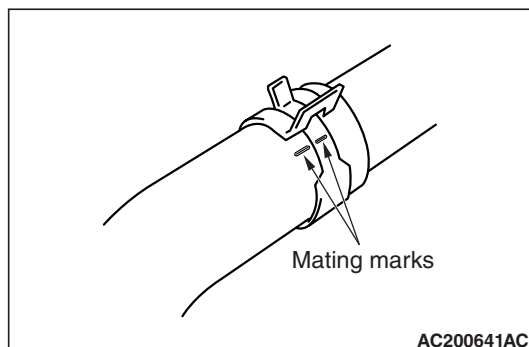
Removal steps

1. Ignition coil connectors
2. EGR control solenoid valve connector
3. Detonation sensor connector
4. Engine coolant temperature gauge unit connector
5. Camshaft position sensor connector
6. Engine coolant temperature sensor connector
7. Capacitor connector
8. Earth cable connection
9. PCV hose connection
10. Vacuum pipe <Vehicles with auto-cruise control>
11. Vacuum hose and pipe assembly
12. Solenoid valve assembly

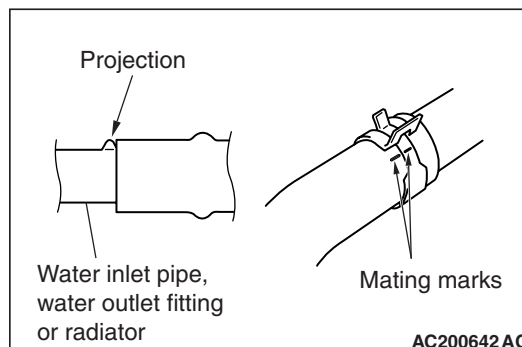
<<A>> >>A<<

Removal steps (Continued)

13. Brake booster vacuum hose connection
14. Oil level gauge and guide
15. O-ring
16. Detonation sensor connector clamp
17. Radiator lower hose connection
18. EGR valve
19. EGR valve gasket
20. Heater water hoses connection
21. Thermostat case assembly
22. O-ring
23. Intake manifold stay
24. Intake manifold assembly
25. Intake manifold gasket

REMOVAL SERVICE POINT**<<A>> RADIATOR LOWER HOSE DIS-CONNECTION**

Make mating marks on the radiator hose and the hose clamp. Disconnect the radiator hose.

INSTALLATION SERVICE POINT**>>A<< RADIATOR LOWER HOSE CON-NECTION**

1. Insert each hose as far as the projection of the water inlet fitting.
2. Align the mating marks on the radiator hose and hose clamp, and then connect the radiator hose.

REMOVAL AND INSTALLATION <4G69>

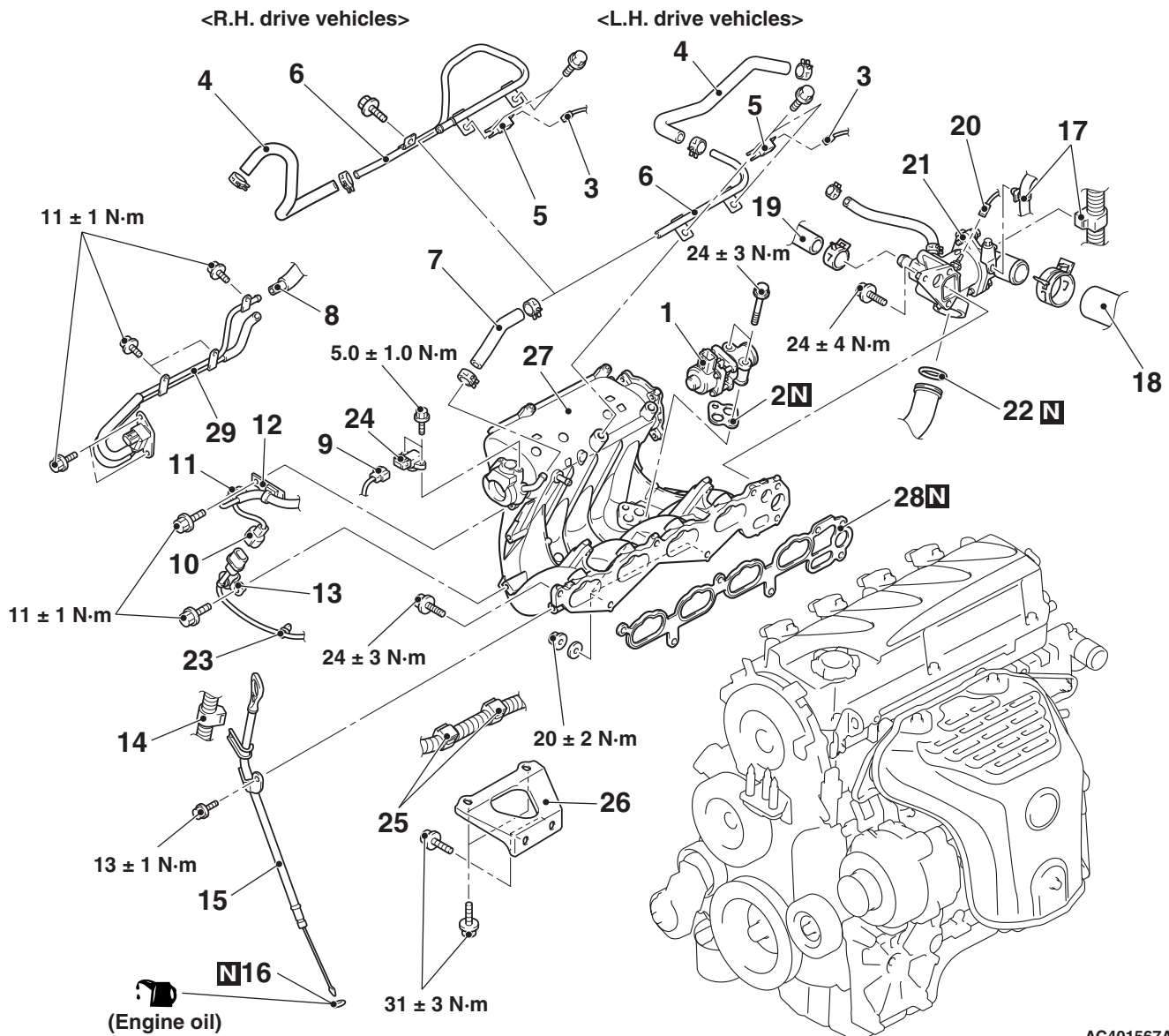
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Pre-removal Operation

- Fuel Line Pressure Reduction [Refer to GROUP 13B, On-vehicle Service – Fuel Pump Connector Disconnection (How to Reduce Pressurized Fuel Lines) [P.13B-404](#)].
- Engine Coolant Draining (Refer to GROUP 14, On-vehicle Service – Engine Coolant Replacement [P.14-10](#)).
- Air Cleaner Cover and Air Intake Hose Removal (Refer to [P.15-4](#)).
- Throttle Body Removal (Refer to GROUP 13B, Throttle Body [P.13B-418](#)).
- Delivery Pipe and Injector Assembly Removal (Refer to GROUP 13B, Injector [P.13B-416](#)).

Post-installation Operation

- Delivery Pipe and Injector Assembly Installation (Refer to GROUP 13B, Injector [P.13B-416](#)).
- Throttle Body Installation (Refer to GROUP 13B, Throttle Body [P.13B-418](#)).
- Air Cleaner Cover and Air Intake Hose Installation (Refer to [P.15-4](#)).
- Engine Coolant Refilling (Refer to GROUP 14, On-vehicle Service – Engine Coolant Replacement [P.14-10](#)).
- Fuel Leak Check



AC401567AB

Removal steps

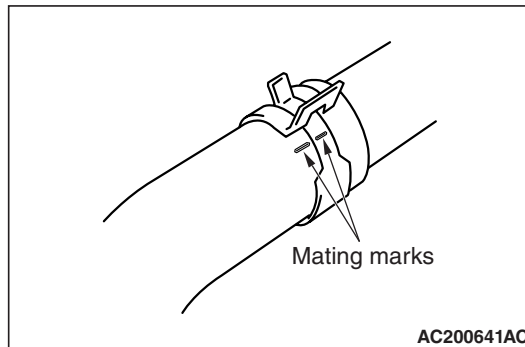
- >>C<<
1. EGR valve
 2. EGR valve gasket
 3. Capacitor connector
 4. Brake booster vacuum hose
 5. Capacitor
 6. Brake booster vacuum pipe

Removal steps (Continued)

7. Brake booster vacuum hose
8. Evaporative emission vacuum hose connection
9. Manifold absolute pressure sensor connector
10. Detonation sensor connector

Removal steps (Continued)

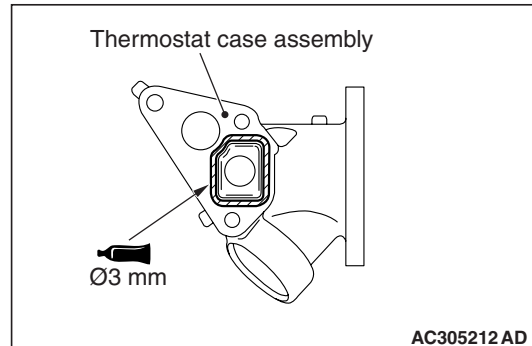
- 11. Evaporative emission purge solenoid valve connector
- 12. Harness clamp
- 13. Detonation sensor connector clamp
- 14. Harness clamp
- 15. Oil level gauge and guide
- 16. O-ring
- 17. Harness clamp
- <<A>> >>B<< 18. Radiator lower hose connection
- 19. Heater water hose connection
- 20. Engine coolant temperature gauge unit connector
- >>A<< 21. Thermostat case assembly
- 22. O-ring
- 23. Detonation sensor harness clamp
- 24. Manifold absolute pressure sensor
- 25. Harness clamp
- 26. Intake manifold stay
- 27. Intake manifold
- 28. Intake manifold gasket
- 29. Evaporative emission purge solenoid valve, evaporative emission vacuum hose and pipe assembly

REMOVAL SERVICE POINT**<<A>> RADIATOR LOWER HOSE DIS-
CONNECTION**

Make mating marks on the radiator hose and the hose clamp. Disconnect the radiator hose.

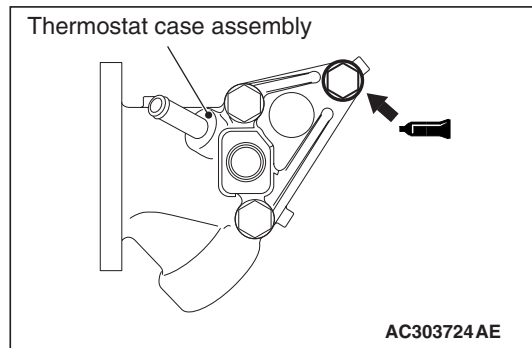
INSTALLATION SERVICE POINTS**>>A<< THERMOSTAT CASE ASSEMBLY
INSTALLATION**

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**

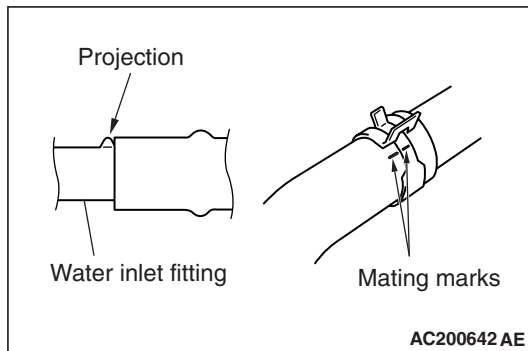


3. Apply sealant to the thread of the thermostat case assembly bolts as shown.

**Specified Sealant: 3M Stud Locking 4170 or
equivalent**

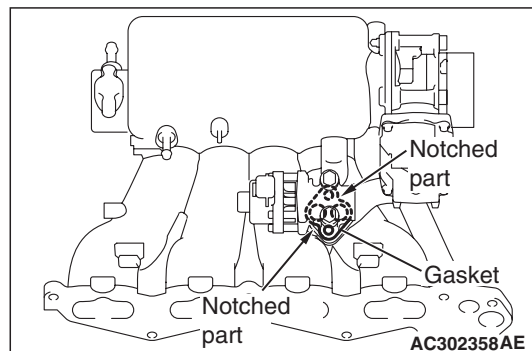
4. With the sealant still wet (within 15 minutes after the sealant is applied), install the thermostat case assembly. Do not apply the sealant in an area more than the required.

>>B<< RADIATOR LOWER HOSE CONNECTION



1. Insert each hose as far as the projection of the water inlet fitting.
2. Align the mating marks on the radiator hose and hose clamp, and then connect the radiator hose.

>>C<< EGR VALVE GASKET INSTALLATION



Install the EGR valve gasket as shown in the illustration.

INSPECTION

M1151003100542

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

Intake 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

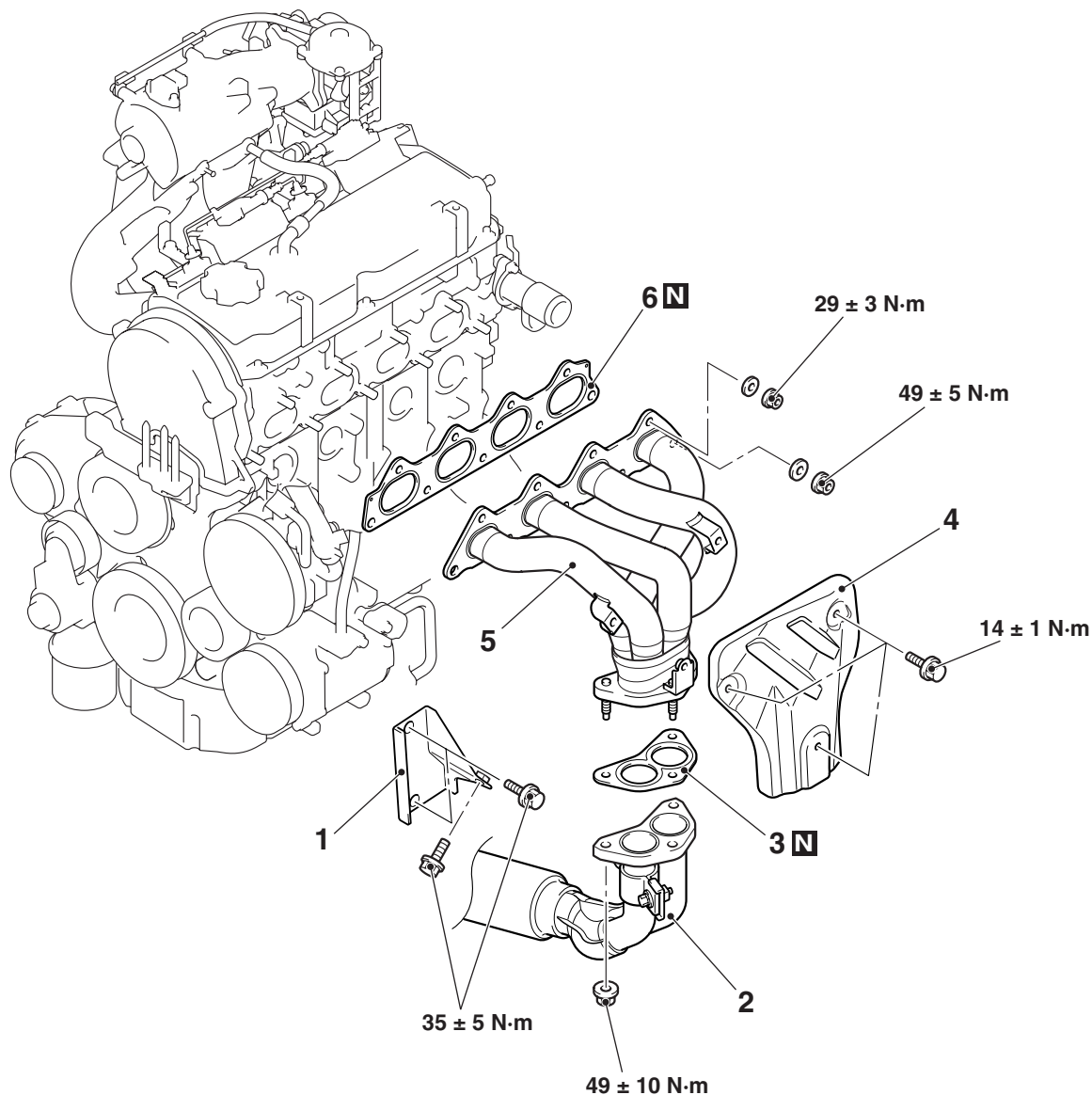
Limit: 0.20 mm

EXHAUST MANIFOLD**REMOVAL AND INSTALLATION <4G64>**

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Pre-removal and Post-installation Operation

- Under Cover Removal and Installation (Refer to GROUP 51, Under Cover [P.51-29](#)).



AC107643AC

Removal steps

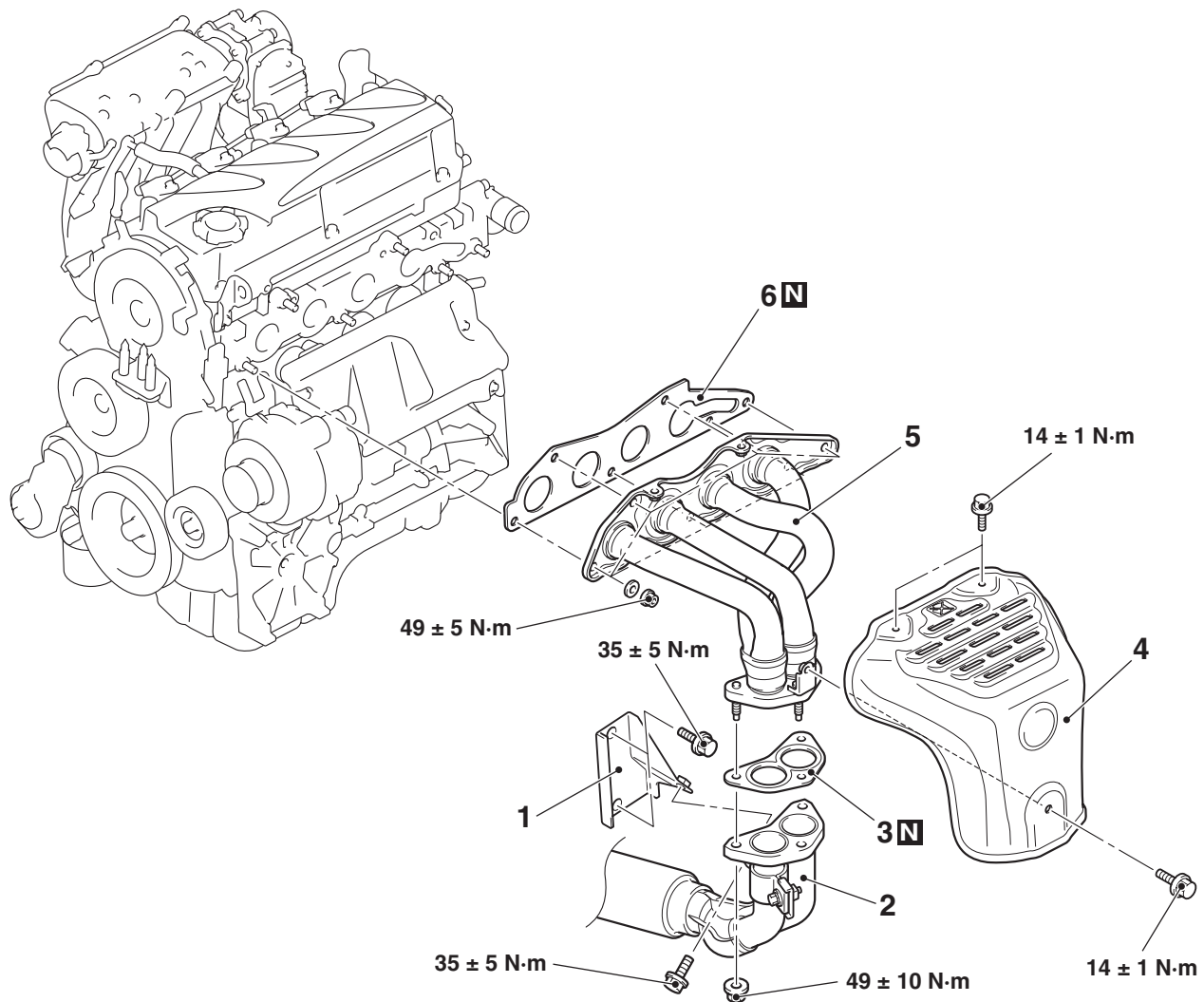
1. Front exhaust pipe bracket
2. Front exhaust pipe connection
3. Gasket

Removal steps (Continued)

4. Heat protector
5. Exhaust manifold
6. Exhaust manifold gasket

**REMOVAL AND INSTALLATION <4G69
(EXCEPT FOR AUSTRALIA AND NEW
ZEALAND)>**

M1151003301312



AC304220AD

Removal steps

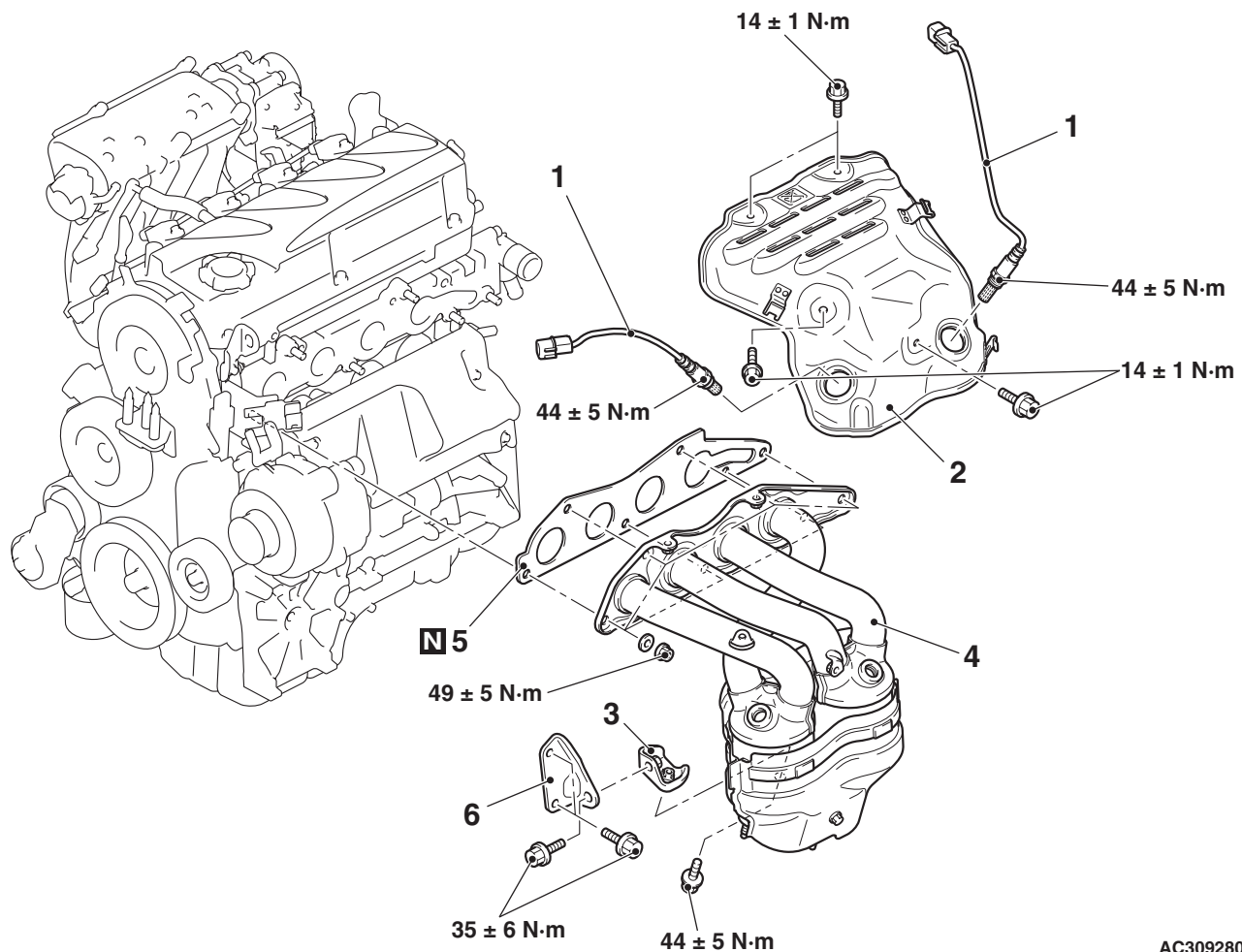
1. Front exhaust pipe bracket
2. Front exhaust pipe connection
3. Gasket

Removal steps (Continued)

4. Exhaust manifold cover
5. Exhaust manifold
6. Exhaust manifold gasket

REMOVAL AND INSTALLATION <4G69 (VEHICLES FOR AUSTRALIA AND NEW ZEALAND)>

M1151003301323



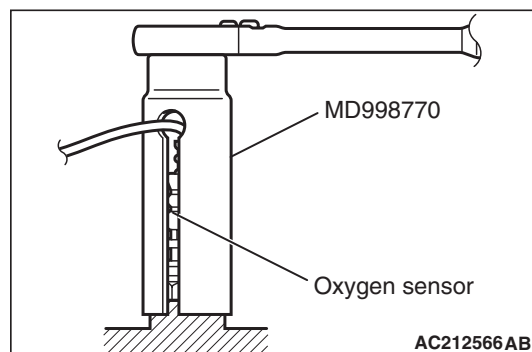
AC309280AC

Removal steps

- <<A>> >>A<<
1. Oxygen sensor
 2. Exhaust manifold cover
 - Front exhaust pipe (Refer to [P.15-13](#)).
 3. Exhaust manifold bracket B
 4. Exhaust manifold
 5. Exhaust manifold gasket
 6. Exhaust manifold bracket A

REMOVAL SERVICE POINT

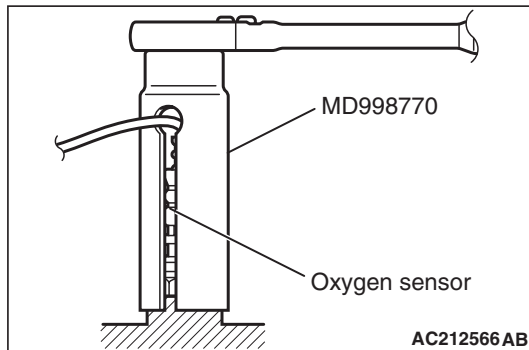
<<A>> OXYGEN SENSOR REMOVAL



Use special tool oxygen sensor wrench (MD998770) to remove the oxygen sensor.

INSTALLATION SERVICE POINT

>>A<< OXYGEN SENSOR INSTALLATION



Use special tool oxygen sensor wrench (MD998770) to install the oxygen sensor.

INSPECTION

M1151003400479

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

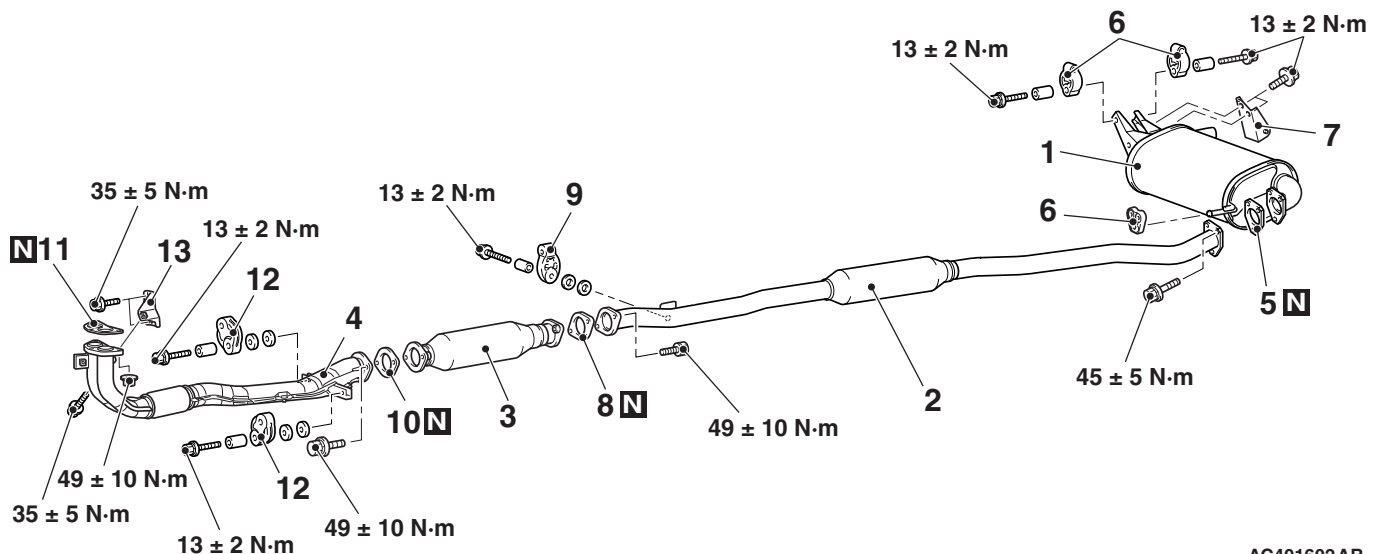
Limit: 0.20 mm

EXHAUST PIPE AND MAIN MUFFLER

REMOVAL AND INSTALLATION

M1151008700936

<4G64>



AC401602 AB

Exhaust main muffler removal steps

1. Exhaust main muffler
5. Exhaust pipe gasket
6. Hanger
7. Exhaust pipe damper

Centre exhaust pipe removal steps

2. Centre exhaust pipe
5. Exhaust pipe gasket
8. Exhaust pipe gasket
9. Hanger

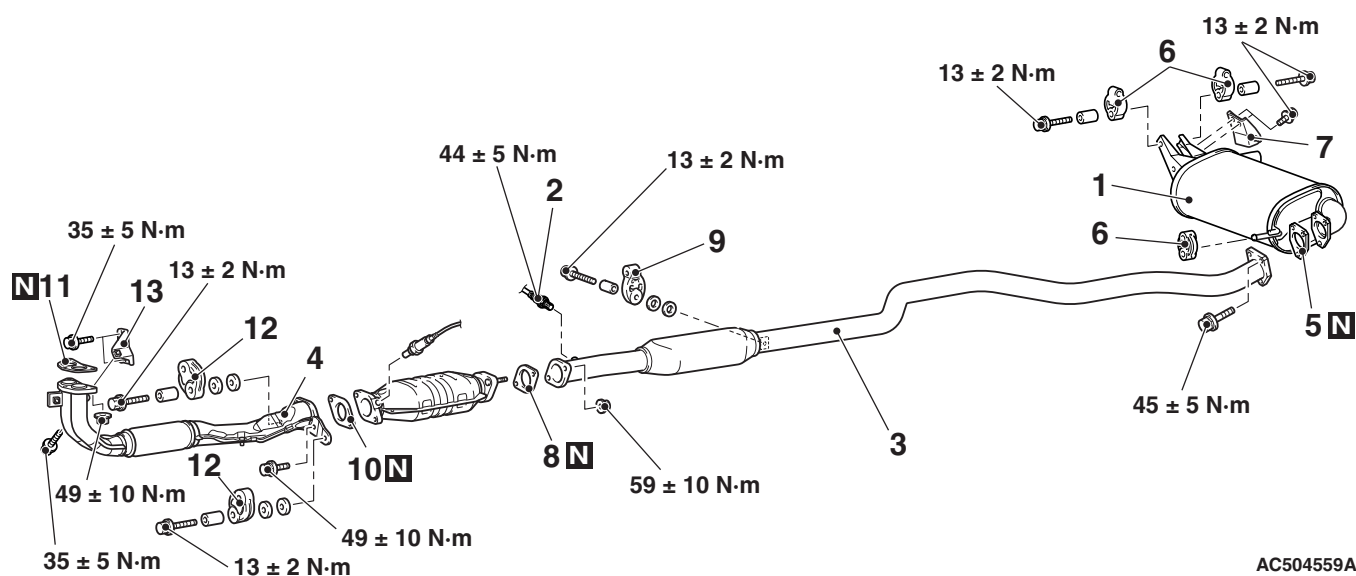
Pre muffler removal steps

3. Pre muffler
8. Exhaust pipe gasket
10. Exhaust pipe gasket

Front exhaust pipe removal steps

- Centre under cover (front) (Refer to GROUP 51, Under Cover P.51-29).
- 4. Front exhaust pipe
- 10. Exhaust pipe gasket
- 11. Exhaust pipe gasket
- 12. Hanger
- 13. Front exhaust pipe bracket

<4G69-2WD>



AC504559AB

Exhaust main muffler removal steps

1. Exhaust main muffler
5. Exhaust pipe gasket
6. Hanger
7. Exhaust pipe damper

Centre exhaust pipe removal steps

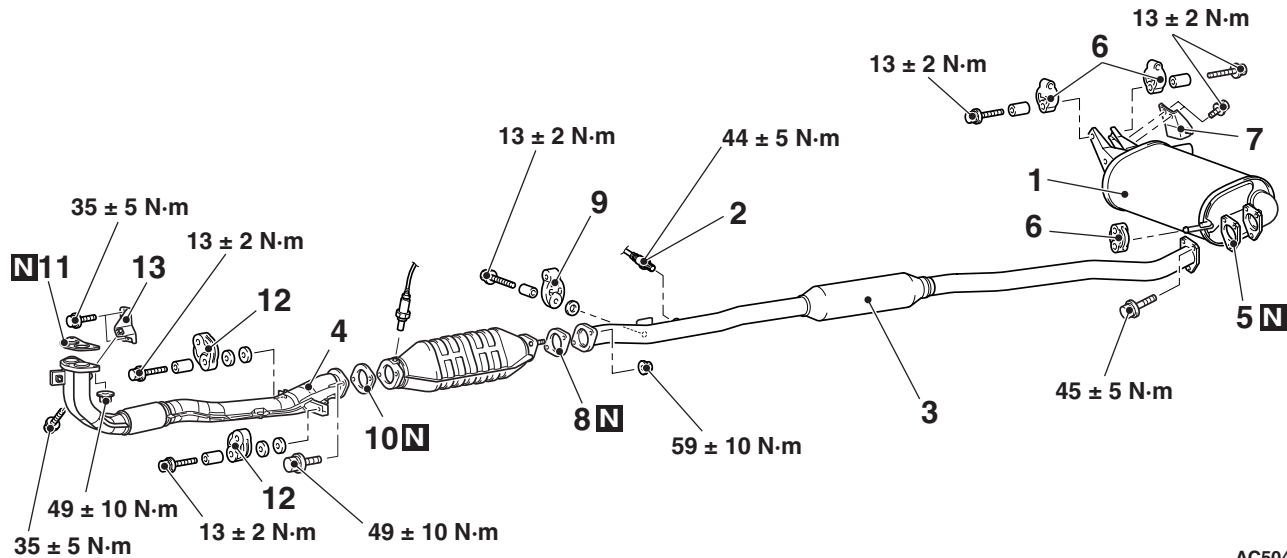
2. Oxygen sensor
3. Centre exhaust pipe
5. Exhaust pipe gasket
8. Exhaust pipe gasket
9. Hanger

Front exhaust pipe removal steps

- Centre under cover (front) (Refer to GROUP 51, Under Cover P.51-29).
- 4. Front exhaust pipe
- 10. Exhaust pipe gasket
- 11. Exhaust pipe gasket
- 12. Hanger
- 13. Front exhaust pipe bracket

<<A>> >>A<<

<4G69-4WD (EXCEPT FOR AUSTRALIA
AND NEW ZEALAND)>



AC504560AB

**Exhaust main muffler removal
steps**

1. Exhaust main muffler
5. Exhaust pipe gasket
6. Hanger
7. Exhaust pipe damper

**Centre exhaust pipe removal
steps**

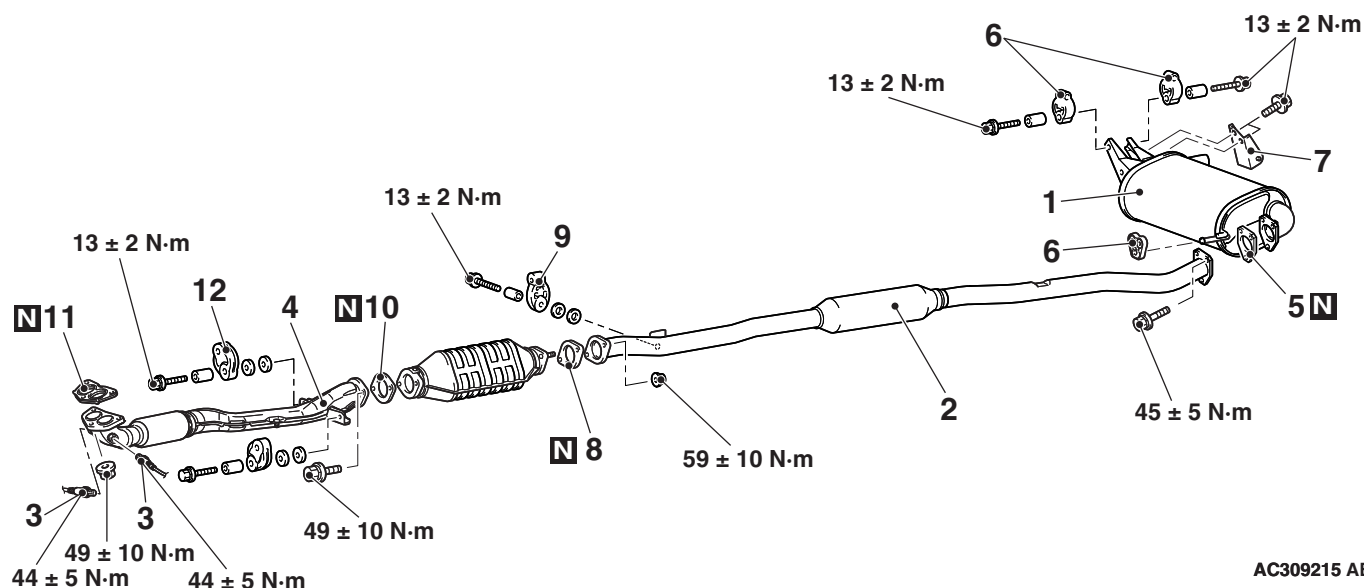
- <<A>> >>A<<
2. Oxygen sensor <Vehicles for Brazil, Chile and Taiwan>
 3. Centre exhaust pipe
 5. Exhaust pipe gasket

**Centre exhaust pipe removal
steps (Continued)**

8. Exhaust pipe gasket
9. Hanger

**Front exhaust pipe removal
steps**

- Centre under cover (front) (Refer to GROUP 51, Under Cover P.51-29).
- 4. Front exhaust pipe
- 10. Exhaust pipe gasket
- 11. Exhaust pipe gasket
- 12. Hanger
- 13. Front exhaust pipe bracket

<4G69-4WD (VEHICLES FOR AUS-
TRALIA AND NEW ZEALAND)>**Exhaust main muffler removal steps**

1. Exhaust main muffler
5. Exhaust pipe gasket
6. Hanger
7. Exhaust pipe damper

Centre exhaust pipe removal steps

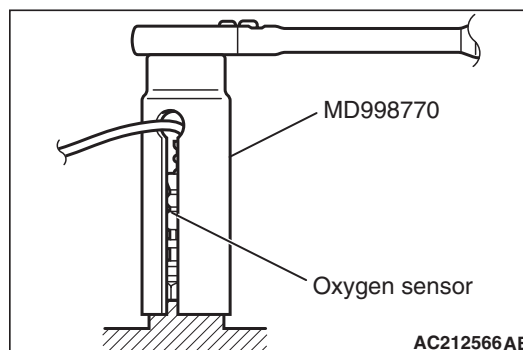
2. Centre exhaust pipe
5. Exhaust pipe gasket
8. Exhaust pipe gasket
9. Hanger

Front exhaust pipe removal steps

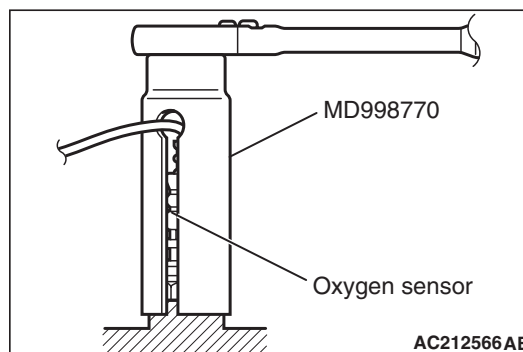
- Centre under cover (front) (Refer to GROUP 51, Under Cover P.51-29).

<<A>> >>A<<

3. Oxygen sensor
4. Front exhaust pipe
10. Exhaust pipe gasket
11. Exhaust pipe gasket
12. Hanger

REMOVAL SERVICE POINT**<<A>> OXYGEN SENSOR REMOVAL**

Use special tool oxygen sensor wrench (MD998770) to remove the oxygen sensor.

INSTALLATION SERVICE POINT**>>A<< OXYGEN SENSOR INSTALLATION**

Use special tool oxygen sensor wrench (MD998770) to install the oxygen sensor.