
INTAKE AND EXHAUST

INTAKE AND EXHAUST

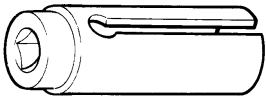
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SERVICE SPECIFICATION

Items	Standard value	Limit
Distortion of the intake manifold installation surface mm	0.15 or less	0.20

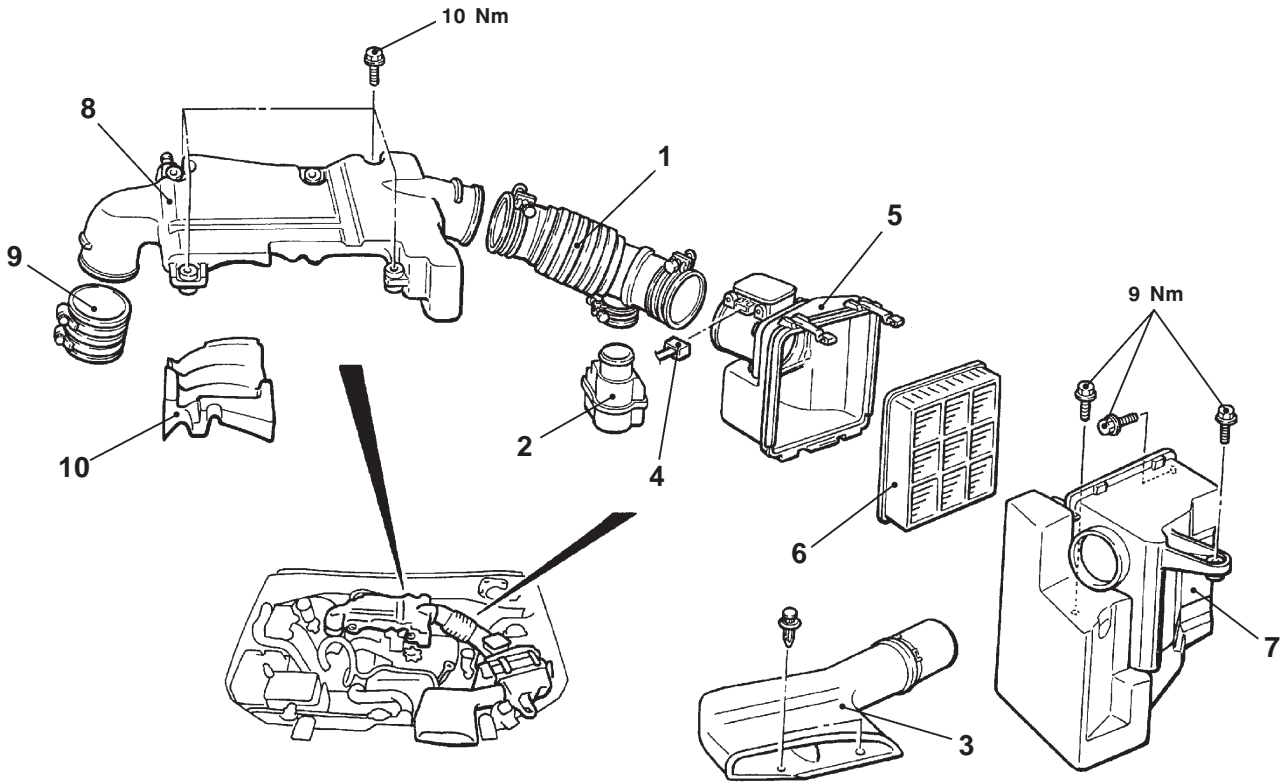
SPECIAL TOOL

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

AIR CLEANER

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
 Engine Cover Removal and Installation



AW0546AL

Air cleaner removal steps

1. Air intake hose
2. Resonator
3. Air duct
4. Air flow sensor connector connection
5. Air cleaner cover
6. Air cleaner element
7. Air cleaner

Resonance tank removal steps

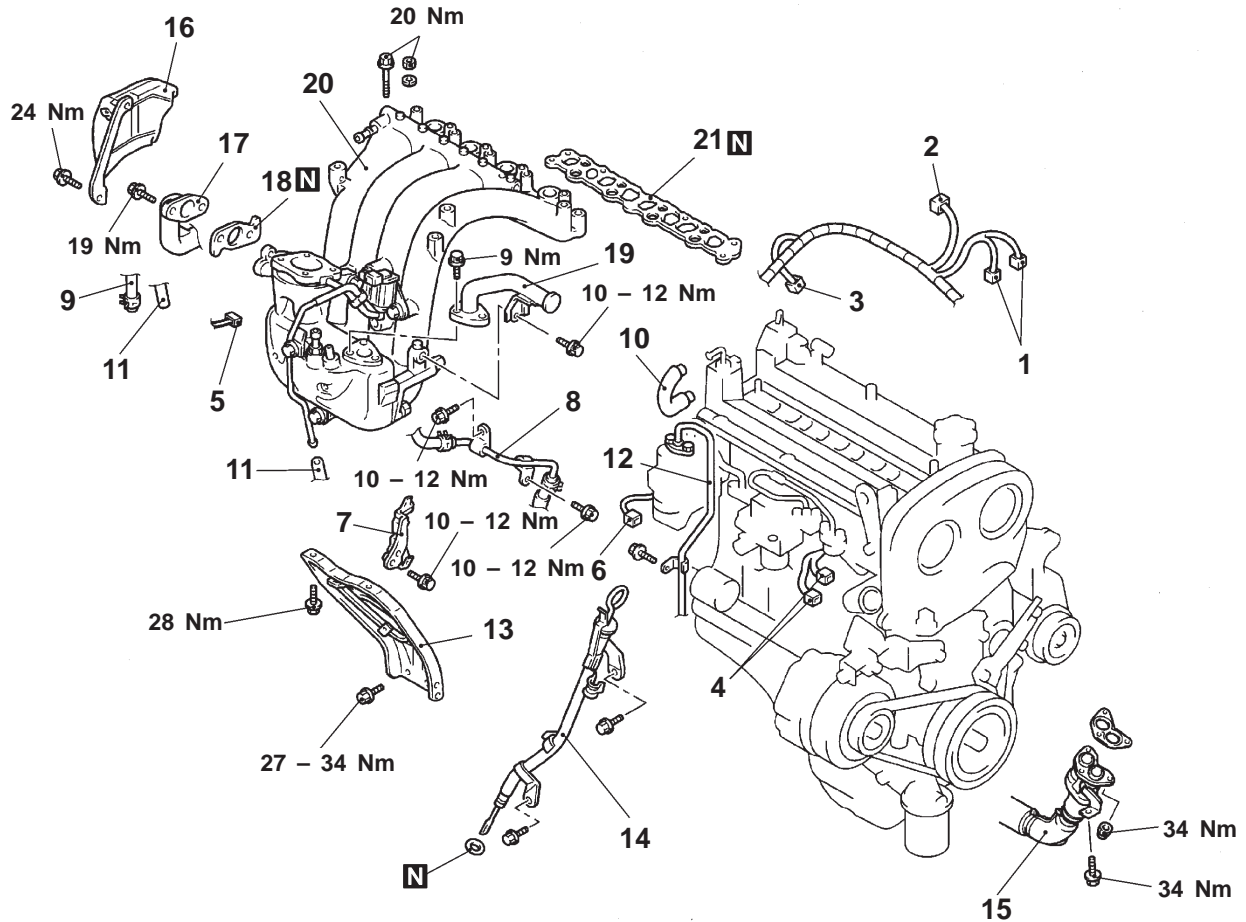
8. Resonance tank
9. Air hose
10. Insulator

INTAKE MANIFOLD

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Engine Coolant Draining and Supplying (Refer to GROUP 14 – On-vehicle Service.)
- Engine Cover and Under Cover Removal and Installation
- Resonance Tank Removal and Installation (Refer to P.15-3.)
- Ignition Coil Removal and Installation (Refer to GROUP 16.)
- Throttle Body Removal and Installation (Refer to GROUP 13A.)



AX0083AL

Removal steps

- | | | |
|---|------------|--|
| <ol style="list-style-type: none"> 1. Engine coolant temperature sensor connector connection 2. Condenser connector connection 3. Camshaft position sensor connector connection 4. Injector harness connector connection 5. Purge control solenoid connector connection 6. EGR valve connector connection 7. Harness connector bracket 8. Water hose and pipe 9. Brake booster vacuum hose | <p>◀A▶</p> | <ol style="list-style-type: none"> 10. PCV hose connection 11. Vacuum hose connection 12. Fuel hose clamp 13. Intake manifold stay 14. A/T fluid level gauge guide 15. Front exhaust pipe connection 16. Fuel pump protector 17. EGR valve support connection 18. Gasket 19. Branch tube 20. Intake manifold assembly 21. Intake manifold gasket |
|---|------------|--|

REMOVAL SERVICE POINT**◀A▶ FUEL PUMP PROTECTOR REMOVAL**

Lift up the transmission with a jack to create clearance between the engine and the front deck, and remove the fuel pump protector.

INSPECTION

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. Using a straight edge and thickness gauge, check for distortion of the cylinder head installation surface.

Standard value: 0.15 mm or less

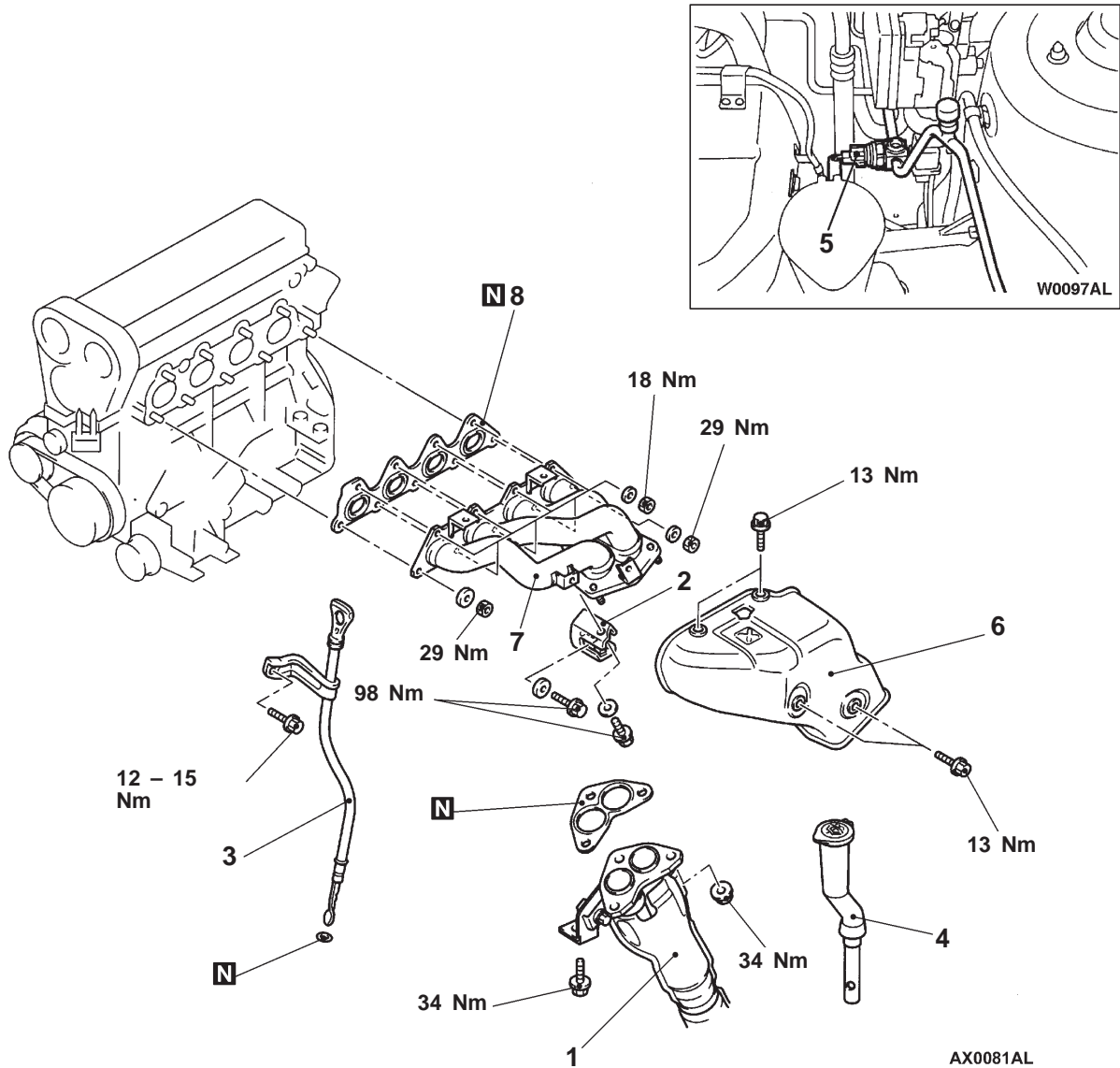
Limit: 0.20 mm

EXHAUST MANIFOLD

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Engine Cover and Under Cover Removal and Installation
- Air Cleaner Removal and Installation (Refer to P.15-3.)

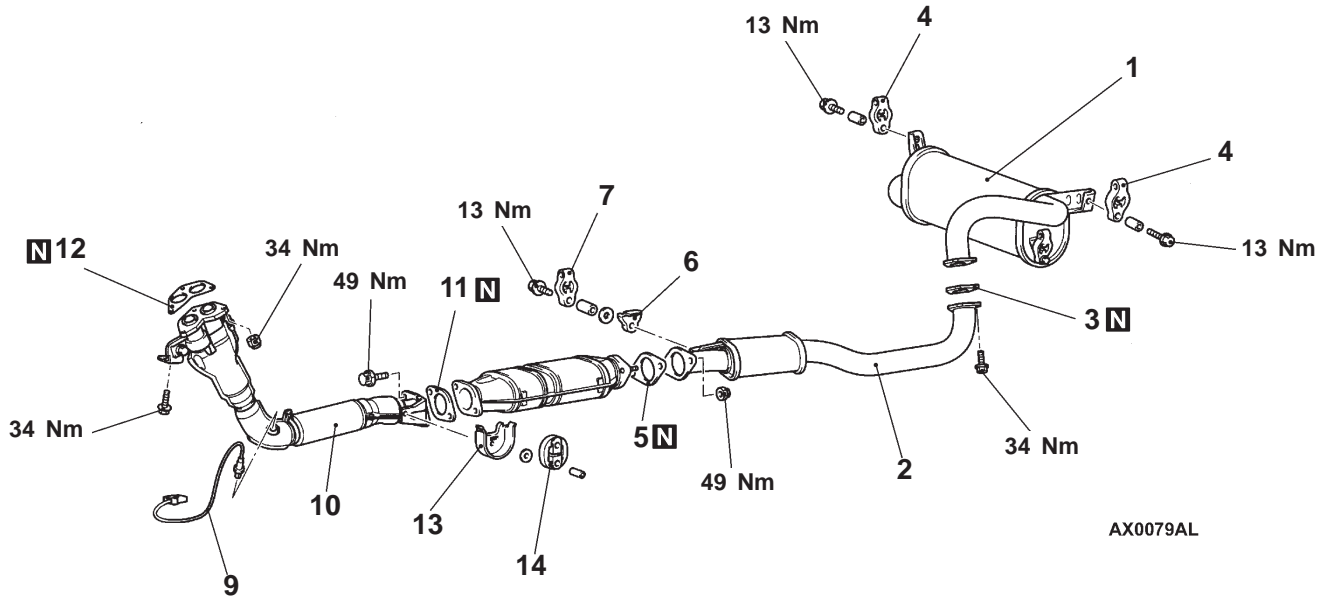
**Removal steps**

1. Front exhaust pipe connection
2. Exhaust manifold bracket
3. Engine oil level gauge guide
4. Washer tank filler tube
5. A/C pressure switch connector connection
6. Exhaust manifold cover
7. Exhaust manifold
8. Exhaust manifold gasket

EXHAUST PIPE AND MAIN MUFFLER

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
 Engine Cover and Under Cover Removal and Installation



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Main muffler removal steps

- 1. Main muffler
- 3. Gasket
- 4. Hanger

Center exhaust pipe removal steps

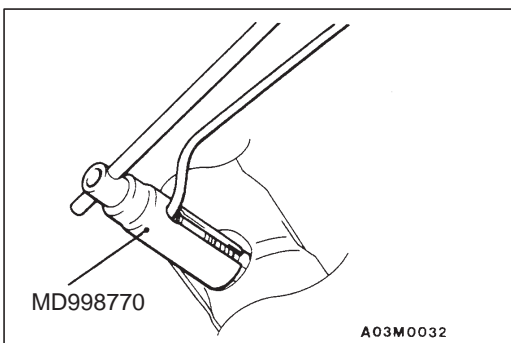
- 2. Center exhaust pipe
- 3. Gasket
- 5. Gasket
- 6. Protector
- 7. Hanger

Pre-muffler removal steps

- 8. Pre-muffler
- 11. Gasket

Center exhaust pipe removal steps

- 9. Oxygen sensor
- 10. Front exhaust pipe
- 11. Gasket
- 12. Gasket
- 13. Heat protector
- 14. Hanger



REMOVAL SERVICE POINT

◀A▶ OXYGEN SENSOR REMOVAL

INSTALLATION SERVICE POINT

▶A◀ OXYGEN SENSOR INSTALLATION

A03M0032

NOTES

GROUP 15 INTAKE AND EXHAUST

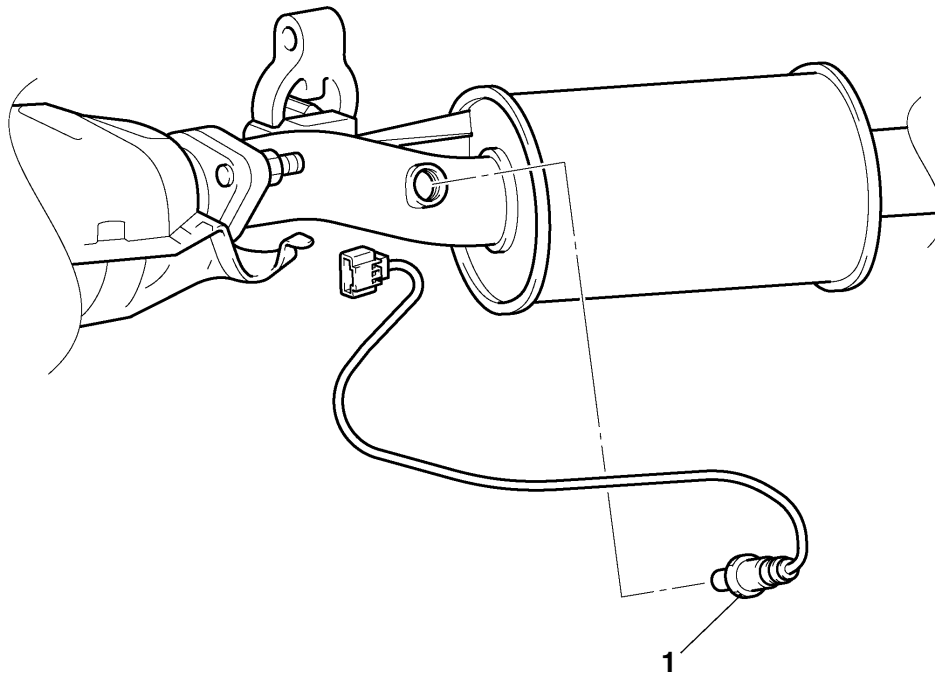
GENERAL

OUTLINE OF CHANGE

Due to the introduction of the oxygen sensor (rear), the following service procedure has been added. The other service procedures are the same as before.

EXHAUST PIPE AND MAIN MUFFLER

REMOVAL AND INSTALLATION

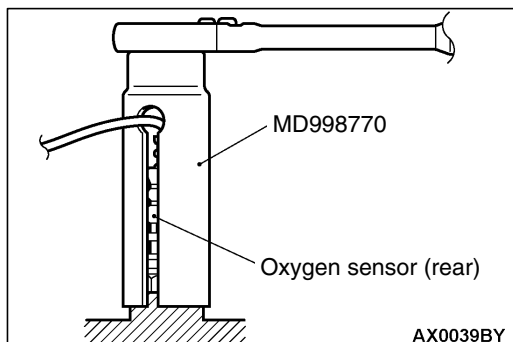


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Removal step



1. Oxygen sensor (rear)



REMOVAL SERVICE POINT

◀▶ OXYGEN SENSOR (REAR) REMOVAL

GROUP 15

INTAKE AND EXHAUST

GENERAL

OUTLINE OF CHANGES

The following service procedures have been established due to the addition of vehicle with 4G9-MPI engine. Other contents are the same as 4G9-GDI engine.

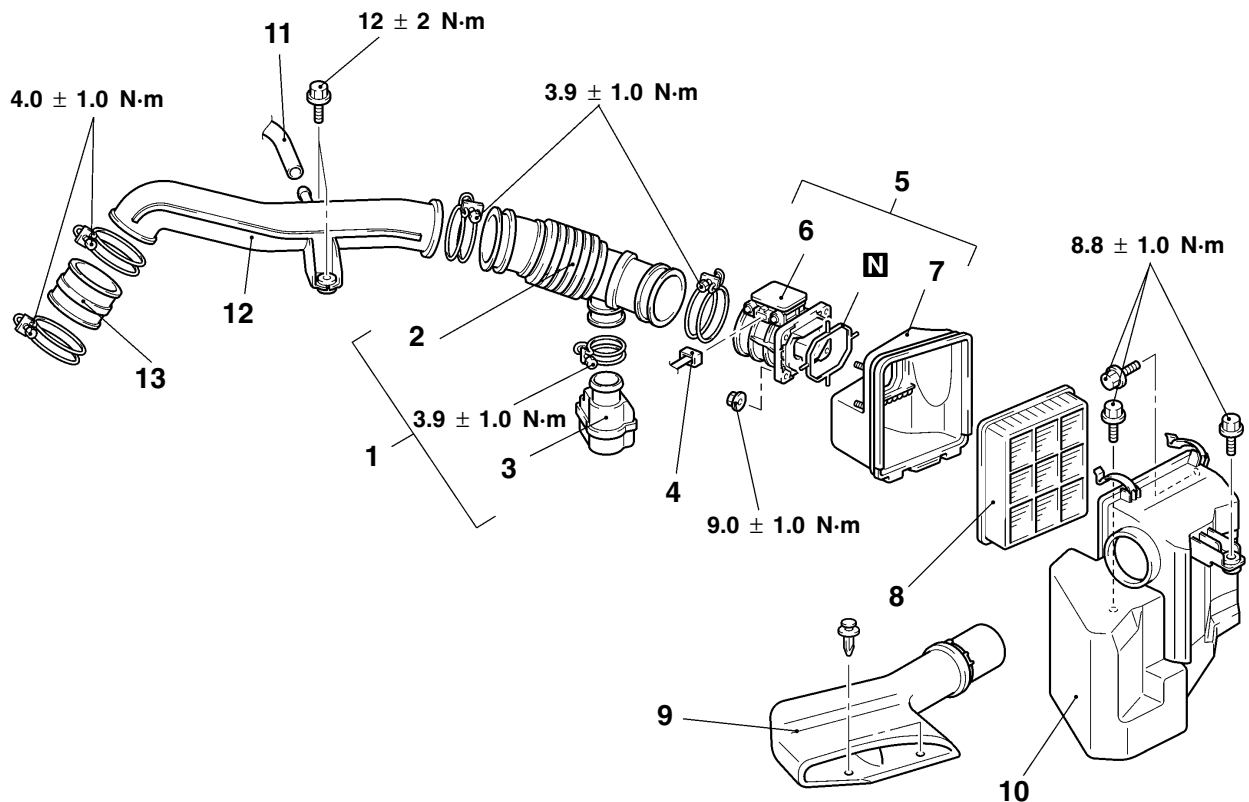
SERVICE SPECIFICATION

Items	Standard value	Limit
Distortion of the intake manifold installation surface mm	0.15 or less	0.20

AIR CLEANER

REMOVAL AND INSTALLATION

<4G9-MPI>



A10009AL

Removal steps

- | | |
|--|------------------------------|
| 1. Air intake hose and resonator | 8. Air cleaner element |
| 2. Air intake hose | 9. Air duct |
| 3. Resonator | 10. Air cleaner |
| 4. Air flow sensor connector | 11. Breather hose connection |
| 5. Air flow sensor and air cleaner cover | 12. Air intake pipe |
| 6. Air flow sensor | 13. Air hose |
| 7. Air cleaner cover | |

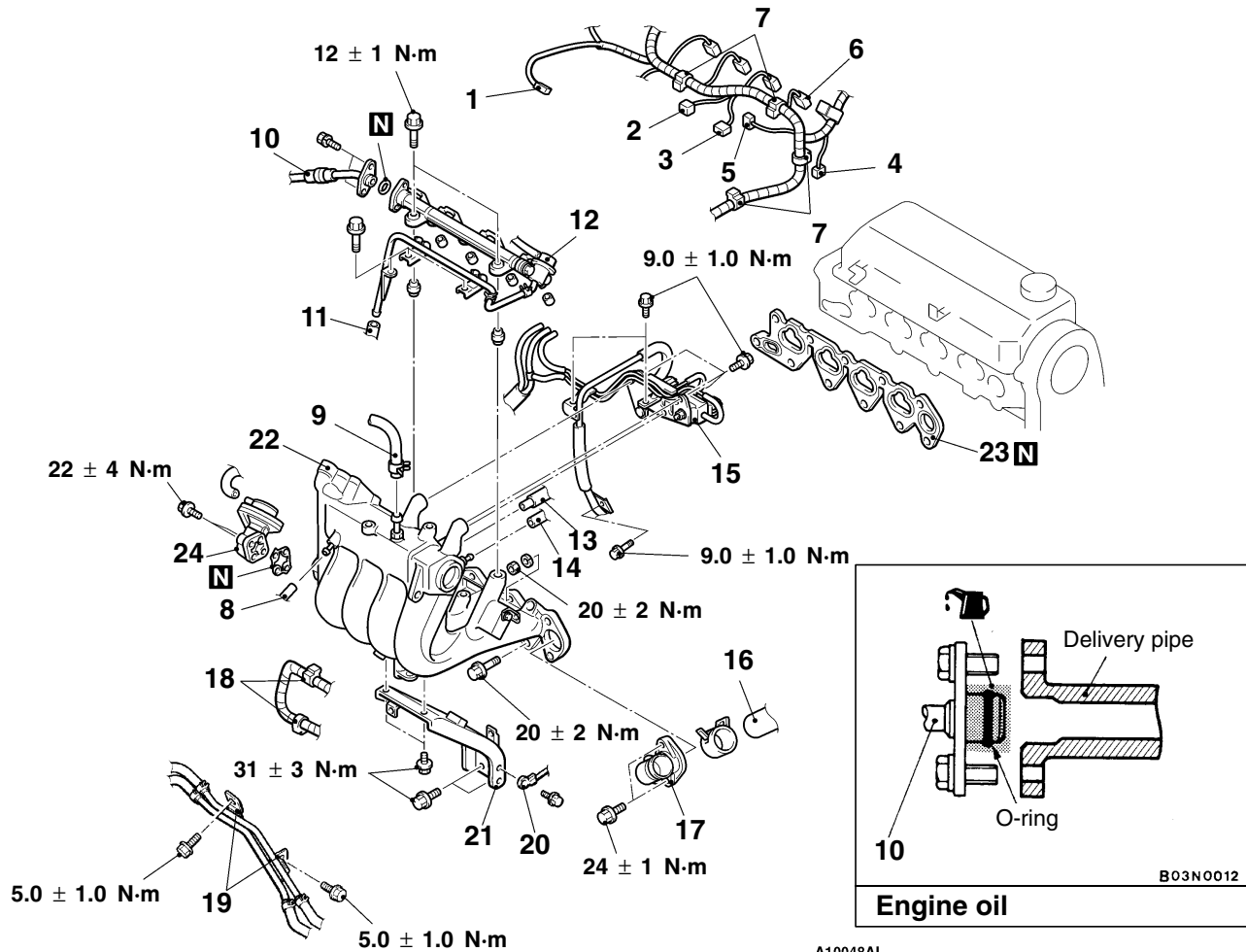
INTAKE MANIFOLD

REMOVAL AND INSTALLATION

<4G9-MPI>

Pre-removal and Post-installation Operation

- Engine Coolant Draining and Supplying
- Under Cover Removal and Installation
- Air Cleaner Removal and Installation (Refer to P.15-2.)
- Throttle Body and Throttle Cable Bracket Removal and Installation (Refer to GROUP 13C.)



Removal steps

- | | | |
|---|------------|--|
| <p>►A◀</p> <ol style="list-style-type: none"> Noise condenser connector Purge control solenoid valve connector EGR solenoid valve connector Crank angle sensor connector Detonation sensor connector Injector connector Control harness clamp Intake manifold vacuum hose connection Brake booster vacuum hose connection Fuel pressure hose Return hose | <p>◀B▶</p> | <ol style="list-style-type: none"> Delivery pipe, injector and fuel pressure regulator assembly PCV hose connection Vacuum hose connection Solenoid valve and bracket assembly Radiator upper hose Water outlet fitting Battery harness clamp A/T oil cooler pipe clamp <A/T> Earth cable connection Intake manifold stay Intake manifold assembly Intake manifold gasket EGR valve |
|---|------------|--|

REMOVAL SERVICE POINT**◀A▶ FUEL PUMP PROTECTOR REMOVAL**

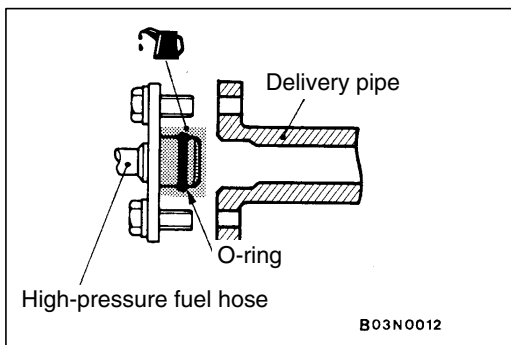
Lift up the transmission with a jack to create clearance between the engine and the front deck, and remove the fuel pump protector.

◀B▶ DELIVERY PIPE, INJECTOR AND FUEL PRESSURE REGULATOR ASSEMBLY REMOVAL

Remove the delivery pipe (with the injectors and fuel pressure regulator attached to it).

Caution

Care must be taken, when removing the delivery pipe, not to drop the injector.

**INSTALLATION SERVICE POINT****▶A◀ HIGH-PRESSURE FUEL HOSE INSTALLATION**

1. When connecting the high-pressure fuel hose to the delivery pipe, apply a small amount of new engine oil to the O-ring and then insert the high-pressure fuel hose, being careful not to damage the O-ring.

Caution

Be careful not to let any engine oil get into the delivery pipe.

2. While turning the high-pressure fuel hose to the left and right, install it to the delivery pipe.
3. Check to be sure that the high-pressure fuel hose turns smoothly.
If it does not turn smoothly, the O-ring may be trapped, remove the high-pressure fuel hose and then re-insert it into the delivery pipe and check once again.

INSPECTION

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. Check for obstruction of the negative pressure (vacuum) outlet port, and for obstruction of the water passage or gas passage.
3. Using a straight edge and thickness gauge, check for distortion of the cylinder head installation surface.

Standard value: 0.15 mm or less

Limit: 0.20 mm

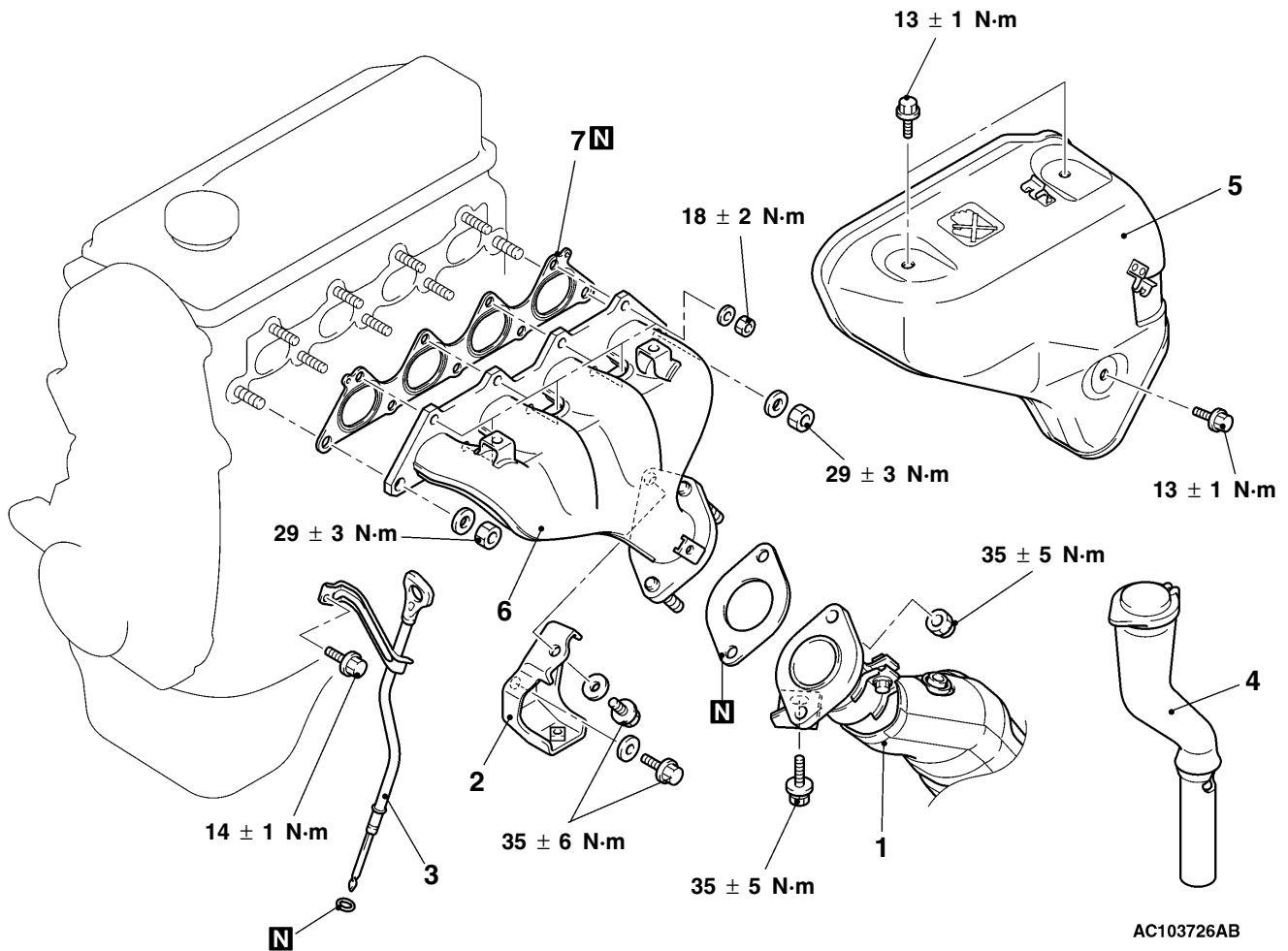
EXHAUST MANIFOLD

REMOVAL AND INSTALLATION

<4G9-MPI>

Pre-removal and Post-installation Operation

- Under Cover Removal and Installation
- Air Cleaner Removal and Installation (Refer to P.15-2.)
- Power Steering Oil Pump Bracket Removal and Installation

**Removal steps**

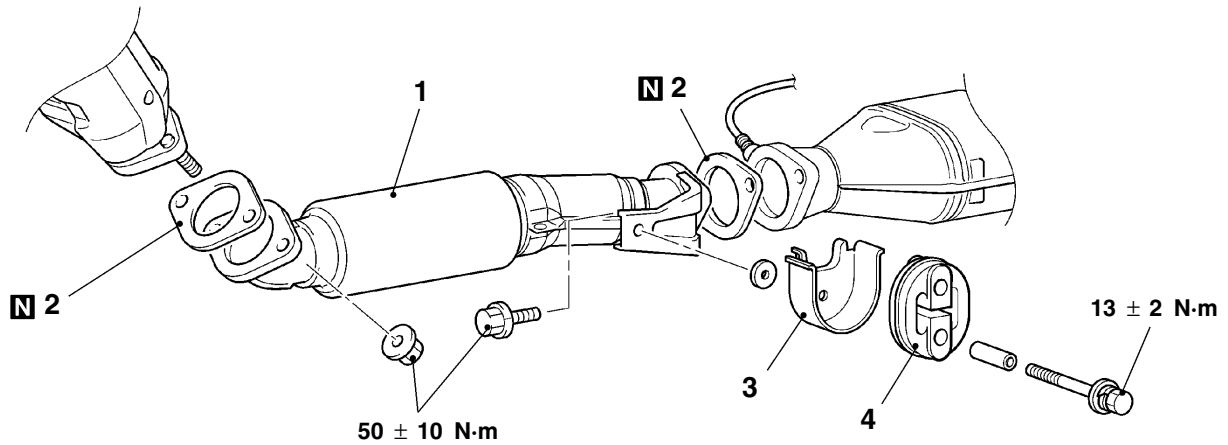
1. Front exhaust pipe connection
2. Exhaust manifold bracket
3. Engine oil level gauge guide
4. Washer tank filler tube
5. Exhaust manifold cover
6. Exhaust manifold
7. Exhaust manifold gasket

EXHAUST PIPE AND MAIN MUFFLER

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
Under Cover Removal and Installation

<4G9-MPI>



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Front exhaust pipe removal steps

1. Front exhaust pipe
2. Gasket

3. Heat protector
4. Hanger

NOTES