

INTAKE AND EXHAUST

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GENERAL INFORMATION

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The intake manifold is made of an aluminium alloy, and the shape provides an increased intake inertia effect and has a good volumetric efficiency.

The exhaust pipe is divided into three parts; the front pipe, the center pipe, and the main muffler.

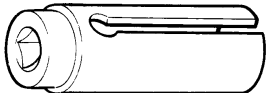
SERVICE SPECIFICATIONS

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

SPECIAL TOOL

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Tool	Number	Name	Use
	MD998770	Oxygen sensor wrench	Removal/Installation of oxygen sensor

ON-VEHICLE SERVICE

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INTAKE MANIFOLD VACUUM CHECK

Refer to GROUP 11 – On-vehicle Service.

INTAKE MANIFOLD

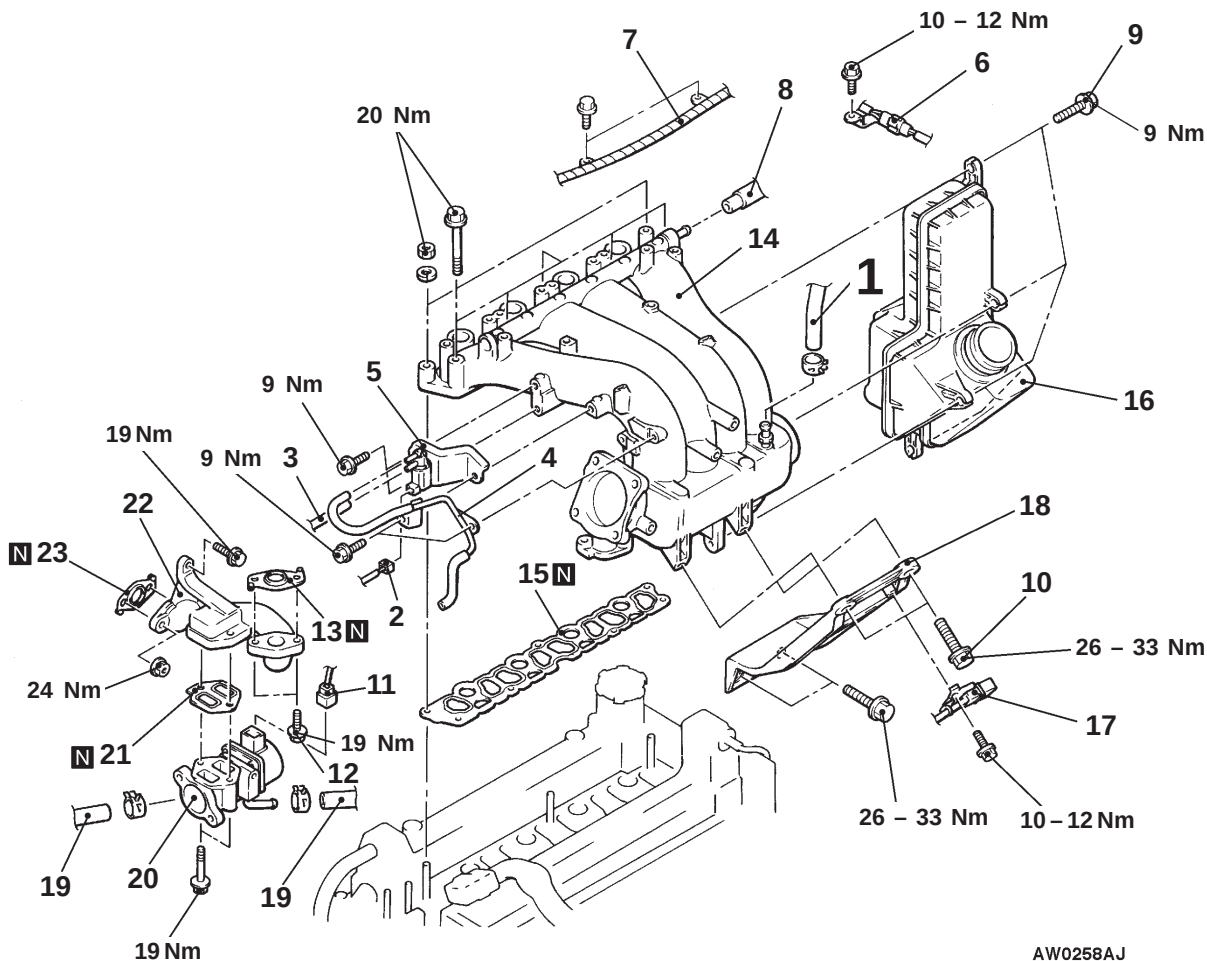
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REMOVAL AND INSTALLATION

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Pre-removal and Post-installation Operation

- Engine Coolant Draining and Supplying (Refer to GROUP 14 – On-vehicle Service.)
- Engine Cover Removal and Installation
- Air Cleaner Removal and Installation
- Ignition Coil Removal and Installation (Refer to GROUP 16.)
- Throttle Body Removal and Installation (Refer to GROUP 13A.)



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Intake manifold removal steps

1. Brake booster vacuum hose connection
2. Purge control solenoid valve connector
3. Vacuum hose connection
4. Vacuum pipe and hose assembly
5. Purge control solenoid valve
6. Connector bracket (for crank angle sensor)
7. Harness clamp
8. PCV hose connection
9. Intake manifold to surging resonator connecting bolt
10. Intake manifold to intake manifold stay connecting bolt
12. Intake manifold to EGR valve support connecting bolt

13. EGR valve gasket
14. Intake manifold assembly
15. Intake manifold gasket
16. Surging resonator
17. Harness connector clamp (for oxygen sensor)
18. Intake manifold stay

EGR valve removal steps

11. EGR servo connector
12. Intake manifold to EGR valve support connecting bolt
13. EGR valve gasket
19. Water hose connection
20. EGR valve assembly
21. EGR valve gasket
22. EGR valve support
23. EGR valve gasket

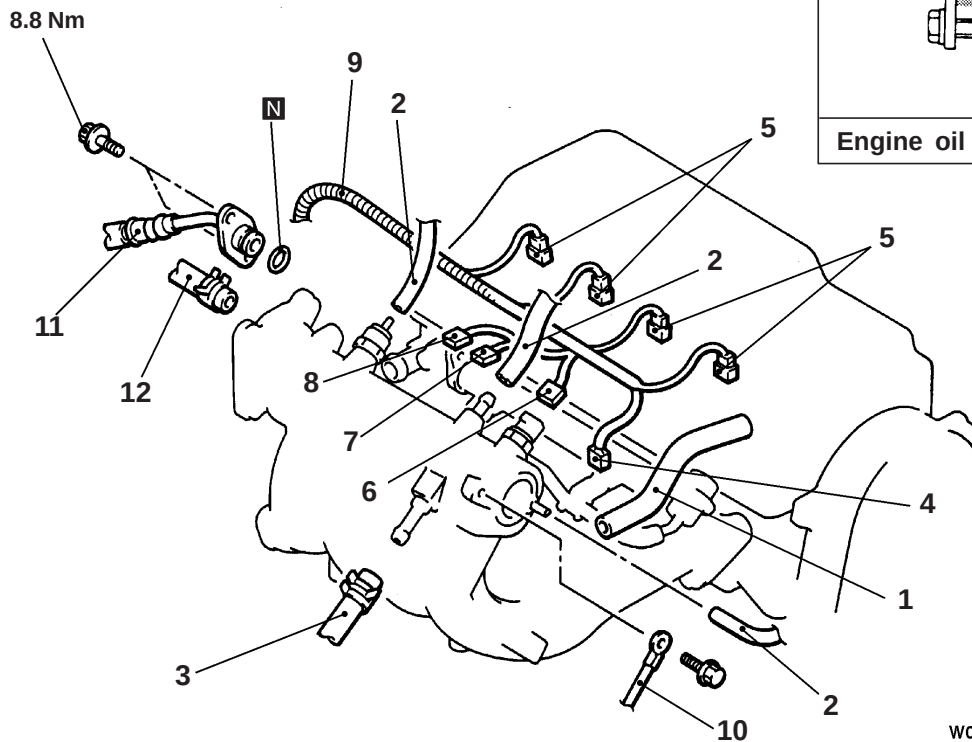
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Pre-removal Operation

- Fuel Discharge Prevention (Refer to GROUP 13B – On-vehicle Service.)
- Engine Coolant Draining (Refer to GROUP 14 – On-vehicle Service.)
- Air Cleaner Removal
- Throttle Body Removal (Refer to GROUP 13B.)

Post-installation Operation

- Throttle Body Installation (Refer to GROUP 13B.)
- Air Cleaner Installation
- Engine Coolant Supplying (Refer to GROUP 14 – On-vehicle Service.)



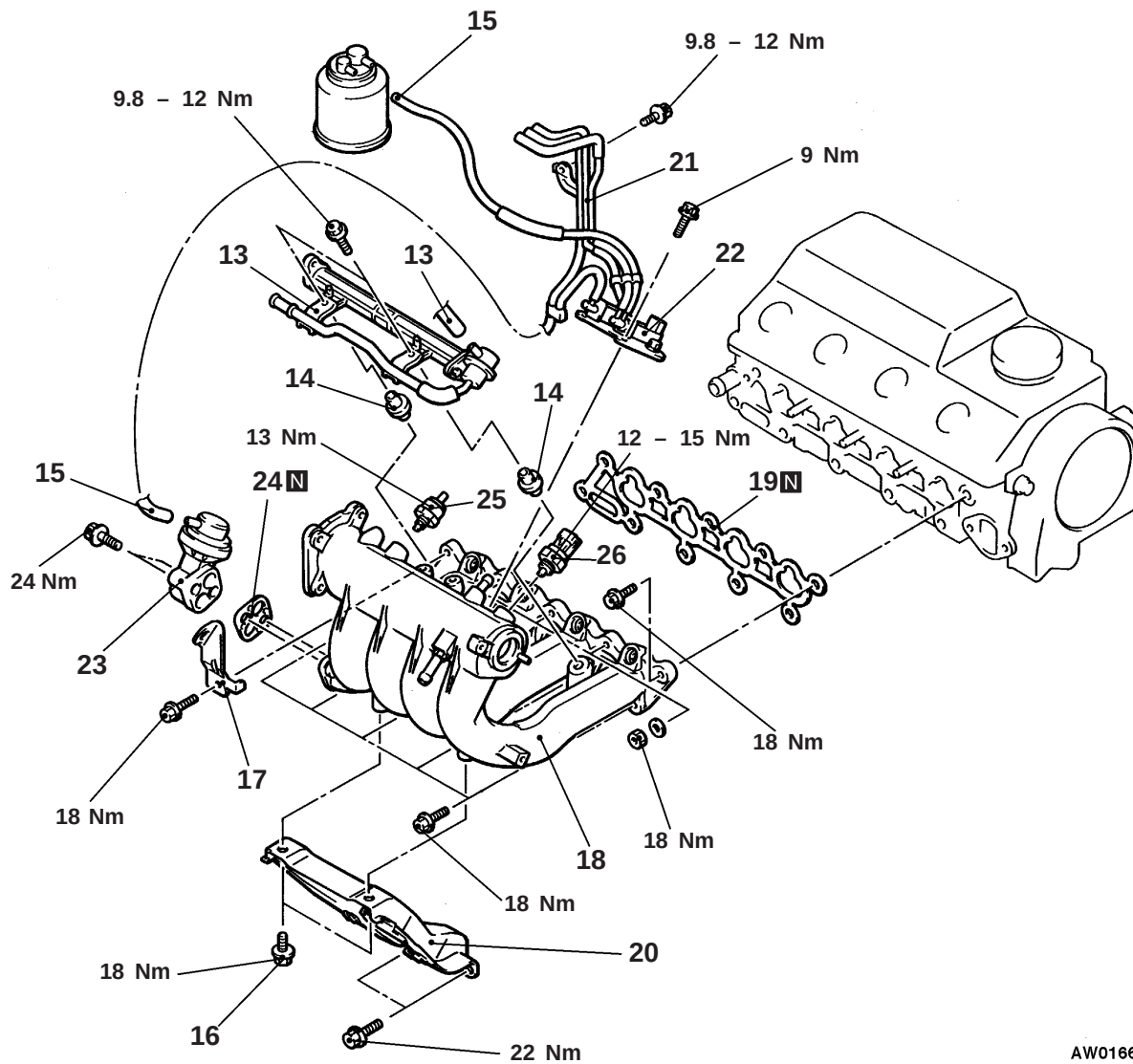
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Removal steps

1. PCV hose
2. Vacuum hose connection
3. Brake booster vacuum hose connection
4. Detonation sensor connector
5. Injector connector
6. Intake air temperature sensor connector
7. Purge control solenoid valve connector
8. EGR solenoid valve connector
9. Control wiring harness
10. Earth wire connection
11. High-pressure fuel hose connection
12. Fuel return hose connection





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- 13. Delivery pipe, fuel return pipe, injector and pressure regulator assembly
- 14. Insulator
- 15. Vacuum hose connection
- 16. Intake manifold stay upper installation bolt
- 17. Engine hanger
- 18. Intake manifold assembly

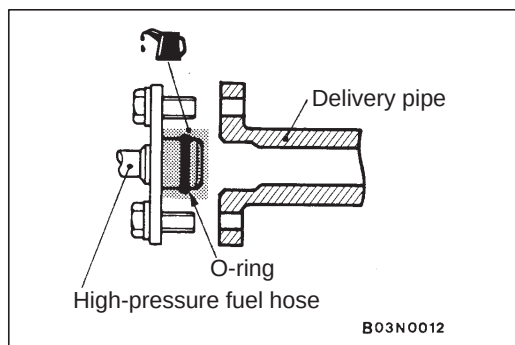
- 19. Intake manifold gasket
- 20. Intake manifold stay
- 21. Vacuum pipe and hose assembly
- 22. Solenoid valve assembly
- 23. EGR valve
- 24. Gasket
- 25. Gas filter assembly
- 26. Intake air temperature sensor

REMOVAL SERVICE POINT**◀A▶ DELIVERY PIPE, FUEL RETURN PIPE, INJECTOR AND PRESSURE REGULATOR ASSEMBLY REMOVAL**

Remove the delivery pipe (with the fuel return pipe, injectors and 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

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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 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

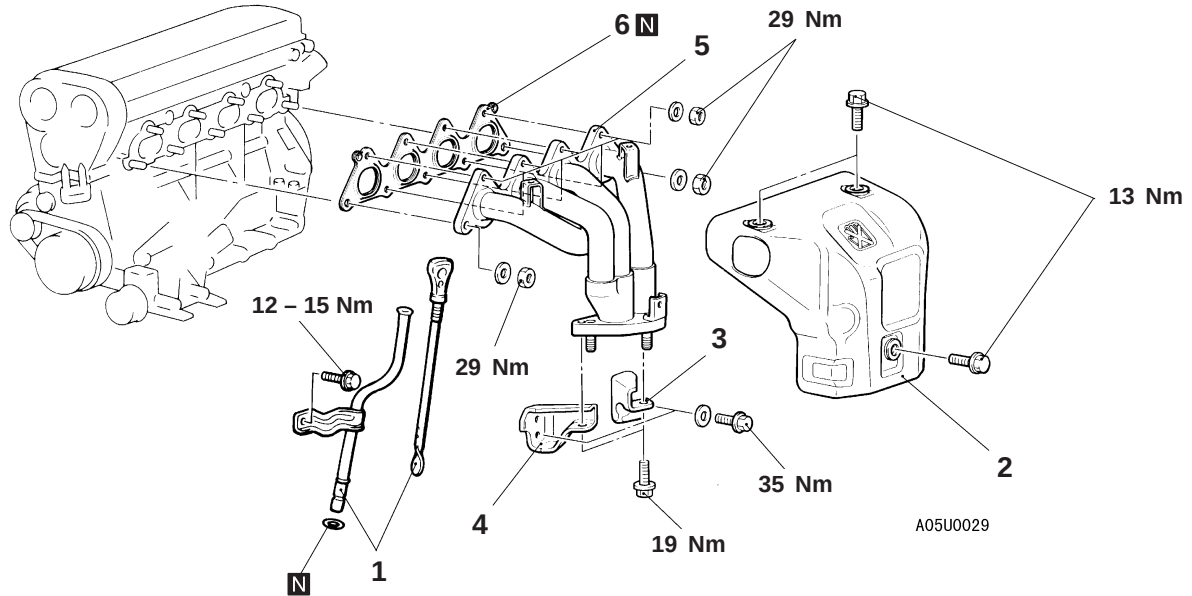
EXHAUST MANIFOLD

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REMOVAL AND INSTALLATION

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Pre-removal and Post-installation Operation
Front Exhaust Pipe Removal and installation
(Refer to P.15-10.)



Removal steps

1. Oil level gauge guide assembly
2. Heat protector
3. Exhaust manifold bracket (A)
4. Exhaust manifold bracket (B)
5. Exhaust manifold
6. Exhaust manifold gasket

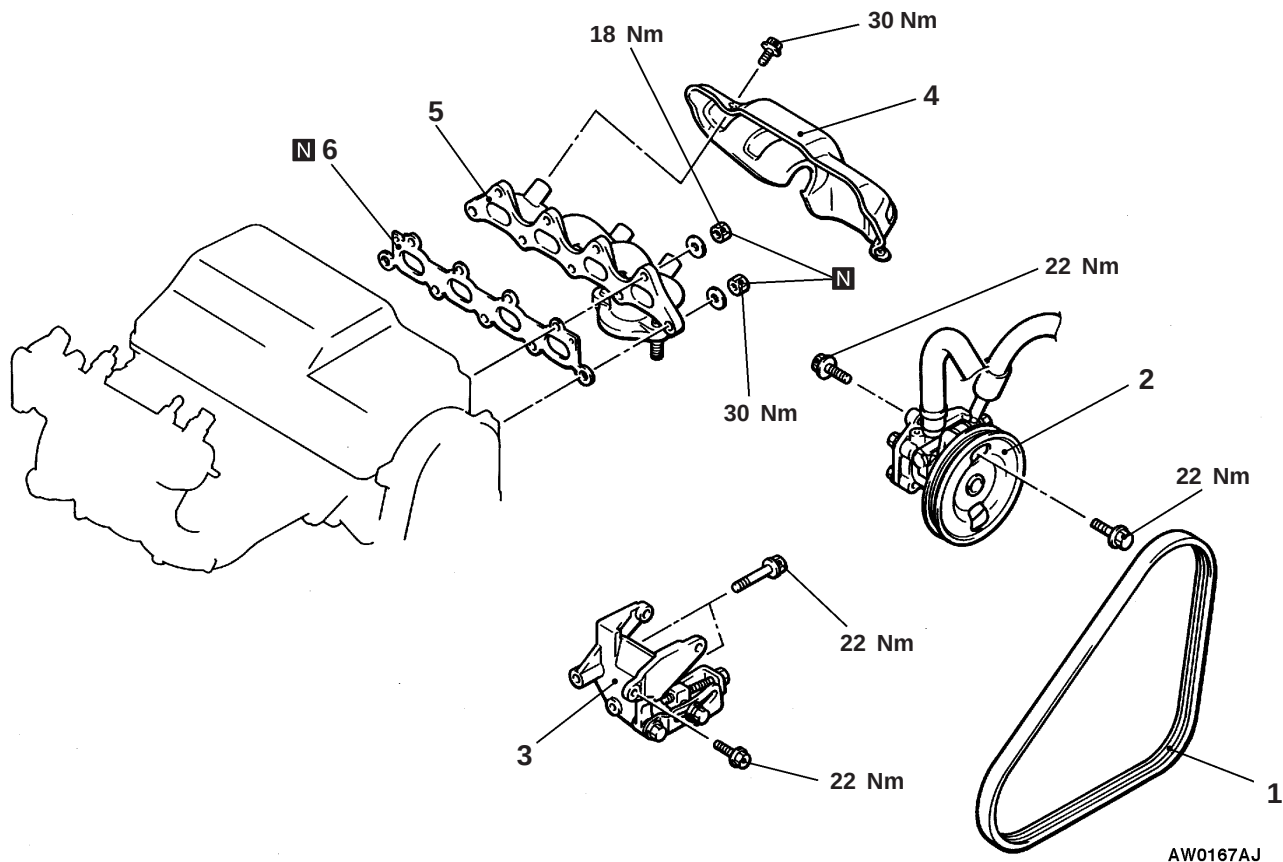
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Pre-removal Operation

- Front Exhaust Pipe Removal (Refer to P. 15-10.)

Post-installation Operation

- Front Exhaust Pipe Installation (Refer to P. 15-10.)
- Drive Belt Tension Adjustment (Refer to GROUP 11B – On-vehicle Service.)

**Removal steps**

1. Drive belt (Power steering)
2. Power steering oil pump
3. Power steering oil pump bracket
4. Exhaust manifold cover
5. Exhaust manifold
6. Exhaust manifold gasket

◀A▶

REMOVAL SERVICE POINT**◀A▶ POWER STEERING OIL PUMP REMOVAL**

Remove the power steering oil pump from the engine with the hose attached.

NOTE

Place the removed power steering oil pump in a place where it will not be a hindrance when removing and installing the exhaust manifold, and tie it with a cord.

INSPECTION

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EXHAUST 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.

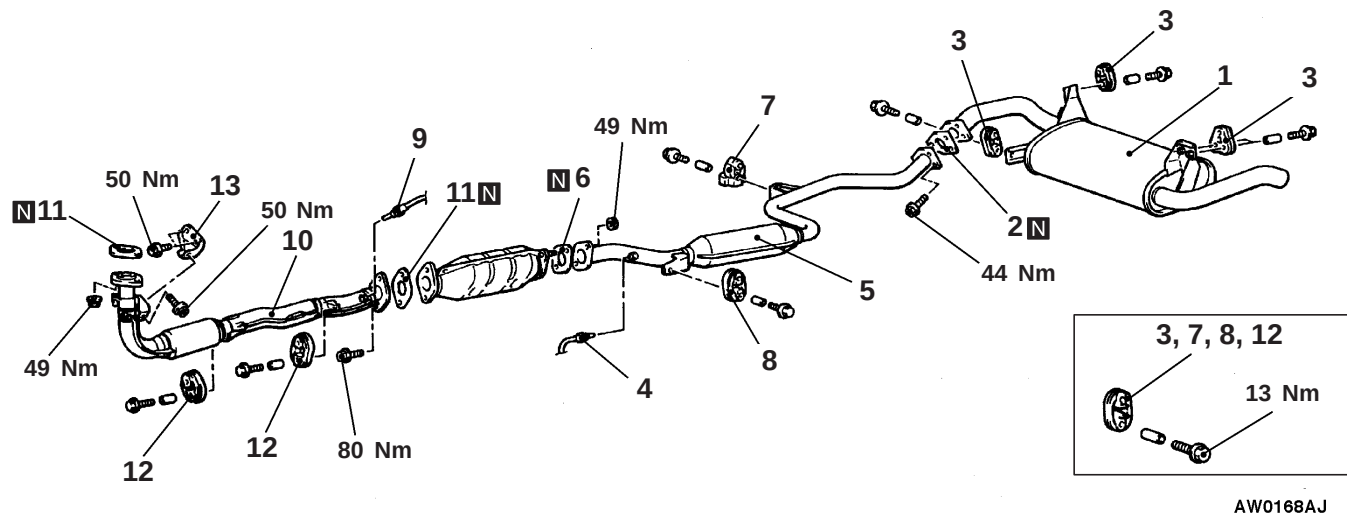
Standard value: 0.15 mm or less

Limit: 0.20 mm

EXHAUST PIPE AND MAIN MUFFLER

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REMOVAL AND INSTALLATION



Main muffler removal steps

1. Main muffler
2. Gasket
3. Hanger

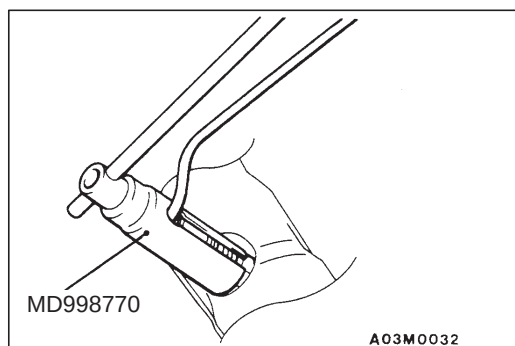
7. Dynamic damper
8. Hanger

Front exhaust pipe removal steps

Center exhaust pipe removal steps

4. Oxygen sensor
5. Center exhaust pipe
6. Gasket

9. Oxygen sensor
10. Front exhaust pipe
11. Gasket
12. Hanger
13. Front exhaust pipe bracket



REMOVAL SERVICE POINT

◀A▶ OXYGEN SENSOR REMOVAL

INSTALLATION SERVICE POINT

▶A◀ OXYGEN SENSOR INSTALLATION