

## GENERAL INFORMATION

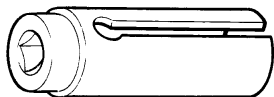
The intake manifold is made of an aluminium alloy, and the shape provides an increased intake inertia effect and has a good volumetric efficiency.

The exhaust pipe is divided into four parts.

## SERVICE SPECIFICATIONS

Items		Standard value	Limit
Intake manifold	Distortion of the installation surface mm	0.15 or less	0.2

## SPECIAL TOOL

Tool	Tool number and name	Supersession	Application
	MD998770 Oxygen sensor wrench	–	Removal/Installation of oxygen sensor <Vehicles with catalytic converter>

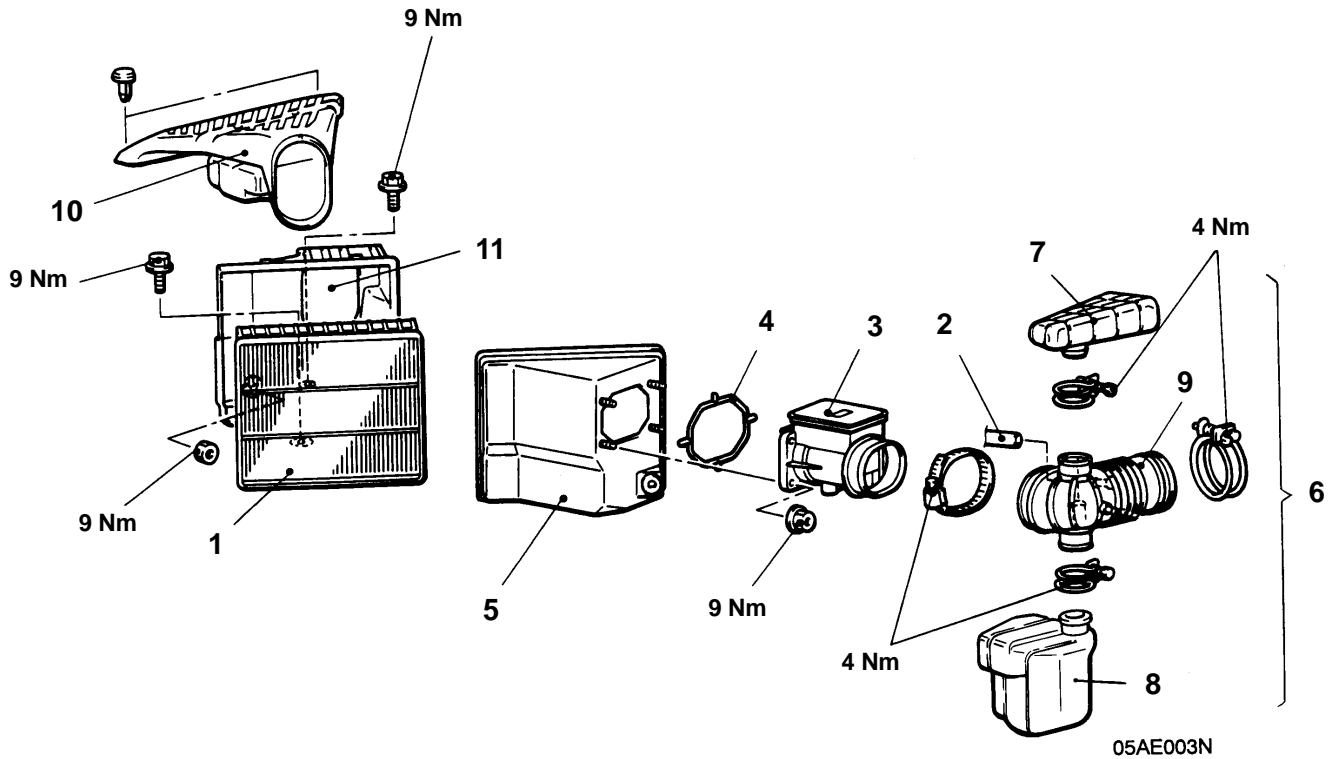
## ON-VEHICLE SERVICE

### INTAKE MANIFOLD VACUUM CHECK

Refer to [Group 11 – On-vehicle Service](#)

# AIR CLEANER

## REMOVAL AND INSTALLATION



### Removal steps

- |                             |                      |
|-----------------------------|----------------------|
| 1. Air cleaner element      | 7. Resonator A       |
| 2. Breather hose            | 8. Resonator B       |
| 3. Air flow sensor          | 9. Air intake hose   |
| 4. Gasket                   | 10. Air duct         |
| 5. Air cleaner cover        | 11. Air cleaner body |
| 6. Air intake hose assembly |                      |

# INTAKE MANIFOLD PLENUM

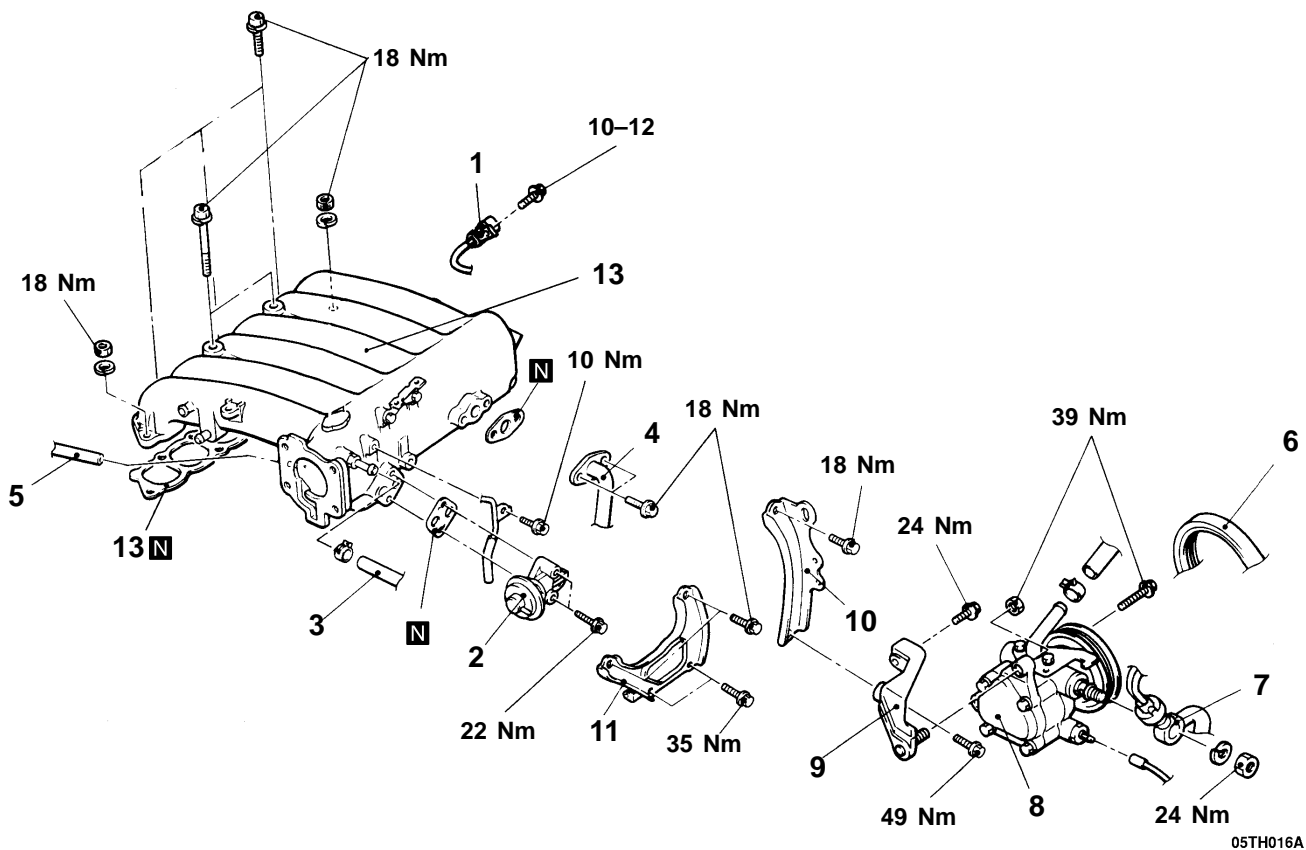
## REMOVAL AND INSTALLATION

### Pre-removal Operation

- (1) Remove the engine cover (Refer to [GROUP 11B – Intake manifold plenum and throttle body](#))
- (2) Remove the throttle body (Refer to [GROUP 13A – Fuel](#))
- (3) Drain the power steering fluid (Refer to [GROUP 37 – On-vehicle service](#))

### Post-installation Operation

- (1) Install the throttle body (Refer to [GROUP 13A – Fuel](#))
- (2) Install the engine cover (Refer to [GROUP 11B – Intake manifold plenum and throttle body](#))
- (3) Add power steering fluid and bleed (Refer to [GROUP 37 – On-vehicle service](#).)
- (4) Adjust the tension of the oil pump belt (Refer to [GROUP 11A – On-vehicle service](#).)



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### Removal steps

1. Crank angle sensor connector
2. EGR valve assembly
3. Brake booster vacuum hose connection
4. EGR pipe assembly connection
5. Fuel pressure regulator vacuum hose connection
6. Oil pump belt

7. Pressure hose
8. Power steering oil pump
9. Pump bracket
10. Intake manifold plenum stay, front
11. Intake manifold plenum stay, rear
12. Intake manifold plenum
13. Intake manifold plenum gasket

## INSPECTION

### INTAKE MANIFOLD PLENUM

1. Check that the intake manifold plenum is not damaged or cracked.
2. Check that the vacuum extraction port is not clogged. If faulty, clean.
3. Using a straight edge and thickness gauge, check the mounting surface for distortion.

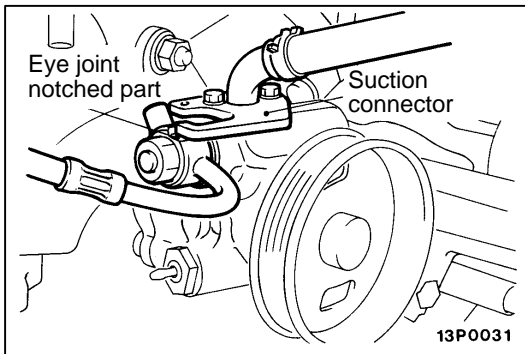
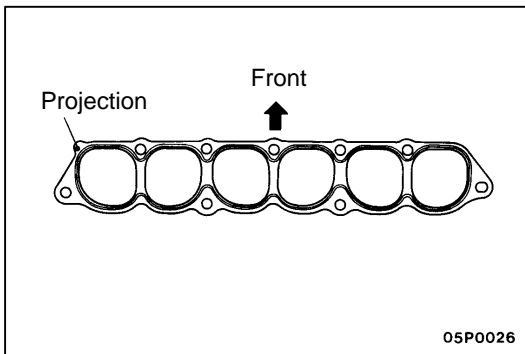
**Standard value: 0.15 mm or less**

**Limit: 0.2 mm**

## INSTALLATION SERVICE POINT

### ►A◀ INTAKE MANIFOLD PLENUM GASKET

Install so that the projection on the gasket is as shown in the diagram.



### ►B◀ PRESSURE HOSE

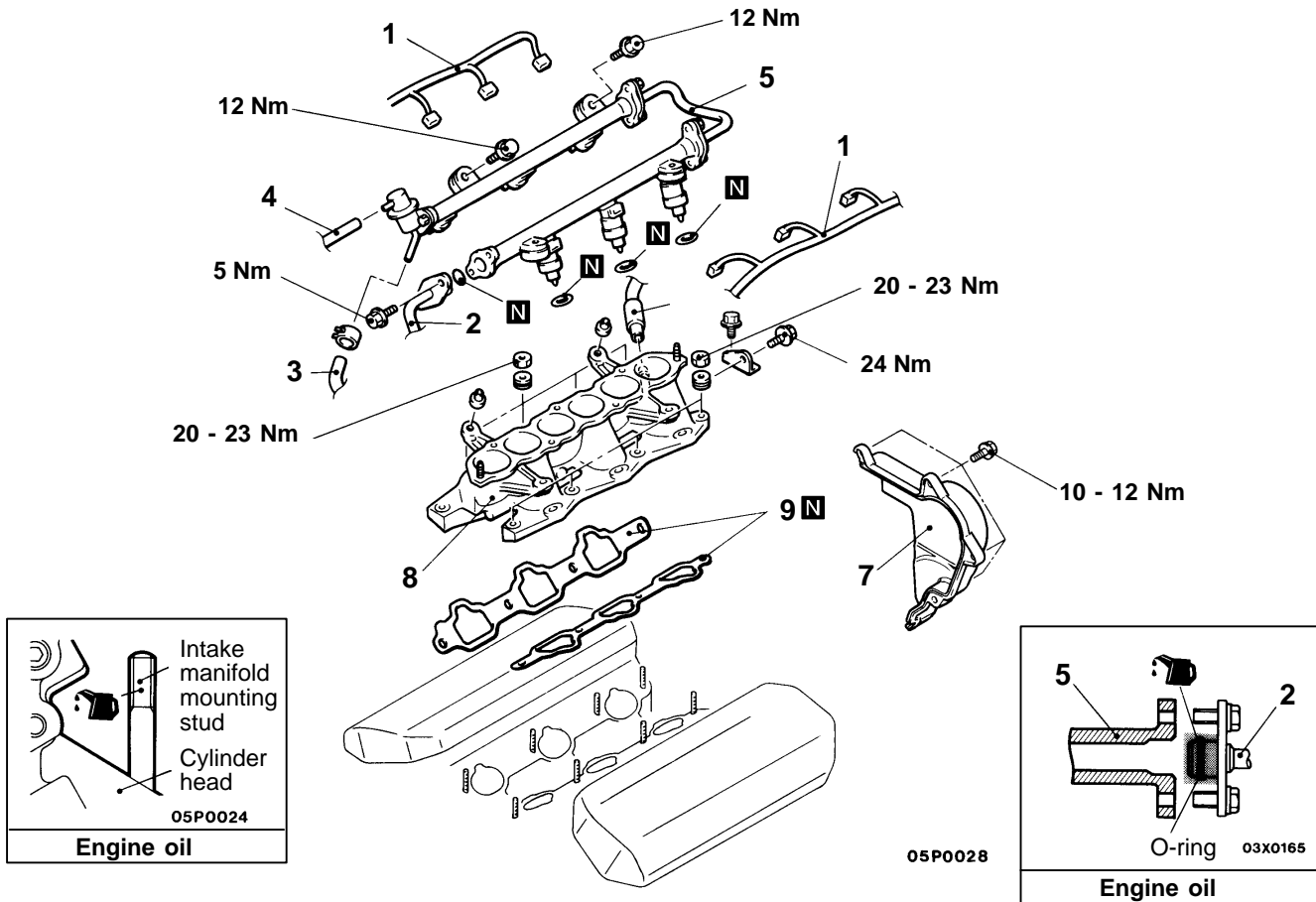
Secure the notched part of the pressure hose eye joint at the position where it contacts the oil pump suction connector.

# INTAKE MANIFOLD

## REMOVAL AND INSTALLATION

### Pre-removal and Post-Installation Operations

- Remove or install the intake manifold plenum (Refer to [P.15-4.](#))
- Fuel discharge prevention (Refer to [GROUP.13 – On-vehicle service](#))



### Removal steps

1. Injector connector
2. Fuel high pressure hose connection
3. Return hose connection
4. Vacuum hose connection
5. Injector and delivery pipe assembly

6. PCV hose connection
7. Timing belt cover(Front upper)
8. Intake manifold
9. Intake manifold gasket

### REMOVAL SERVICE POINT

#### ◀A▶ INJECTOR AND DELIVERY PIPE ASSEMBLY

Remove the delivery pipe with the injectors fitted to the delivery pipe.

#### Caution

Do not drop the injectors when removing the delivery pipe.

## INSPECTION

### INTAKE MANIFOLD

1. Check that the intake manifold is not damaged or cracked. If faulty, replace.
2. Check that the vacuum extraction port is not clogged. If faulty, clean.
3. Using a straight edge and thickness gauge, check the mounting surface for distortion.

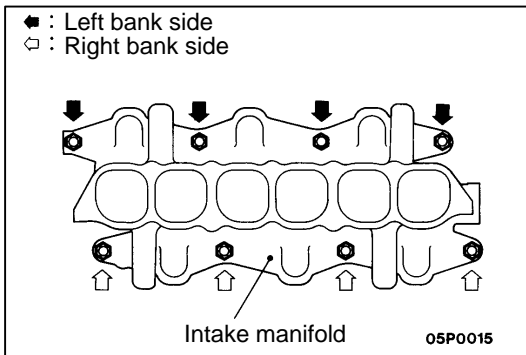
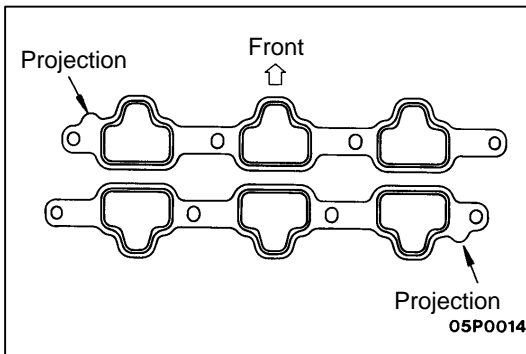
**Standard value: 0.15 mm or less**

**Limit: 0.2 mm**

## INSTALLATION SERVICE POINT

### ►A◀INTAKE MANIFOLD GASKET

Install so that the projection on the gaskets is as shown in the diagram.



### ►B◀INTAKE MANIFOLD

1. Coat the intake manifold mounting studs with engine oil.
2. Tighten the intake manifold mounting nuts in the following sequence.

Sequence	Tightening nuts	Tightening Torque Nm
1	Left bank side nuts	7
2	Right bank side nuts	20 to 23
3	Left bank side nuts	20 to 23
4	Right bank side nuts	20 to 23
5	Left bank side nuts	20 to 23

## INSTALLATION SERVICE POINT

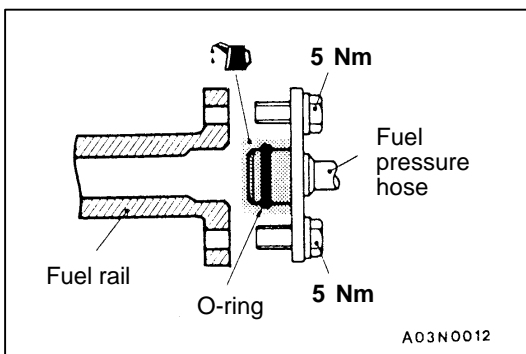
### ►C◀FUEL HIGH PRESSURE HOSE CONNECTION

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

#### Caution

**Do not let engine oil in the fuel rail.**

2. Check that the high-pressure fuel hose turns smoothly. If not, remove the hose and then re-insert it into the fuel rail and check again.
3. Tighten the bolts to the specified torque.

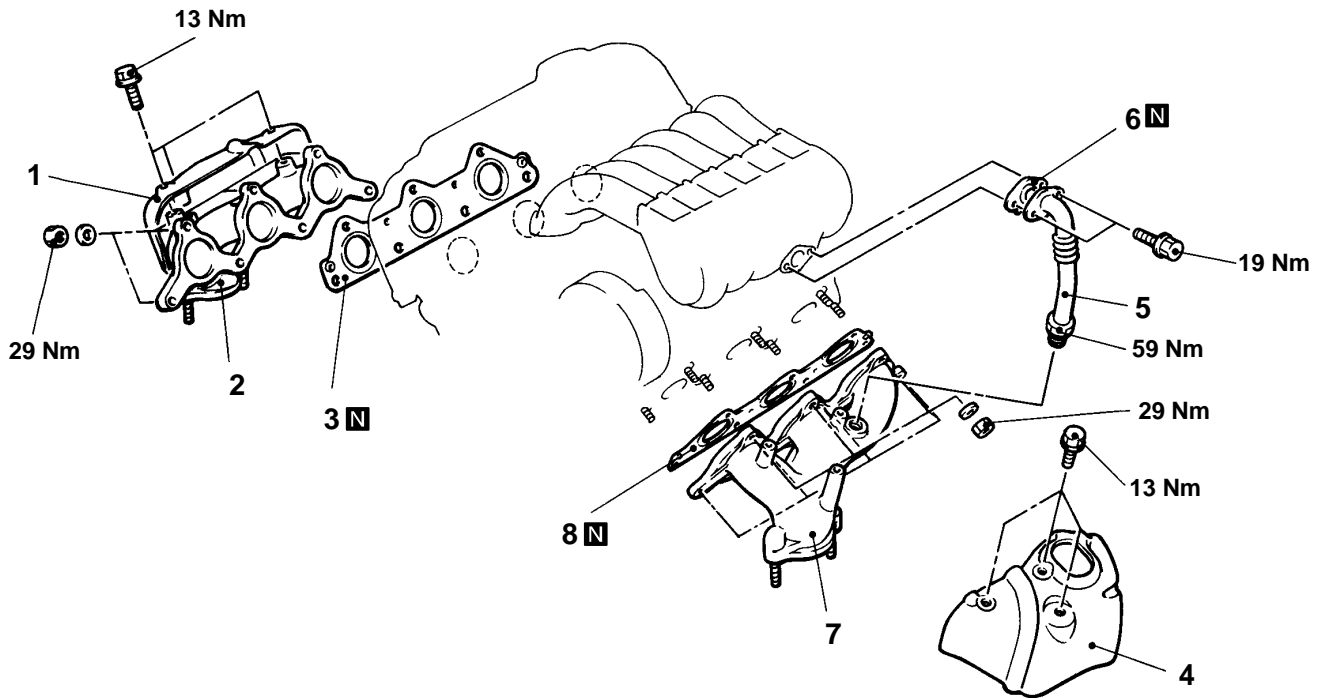


# EXHAUST MANIFOLD

## REMOVAL AND INSTALLATION

### Pre-removal and Post-Installation Operations

- Remove or install the front exhaust pipe (Refer to [P.15-9.](#))
- Remove or install the radiator (Front bank only) (Refer to [GROUP.14](#))
- Remove or install the alternator (Front bank only) (Refer to [GROUP.16](#))



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### Removal Procedure for Front Bank

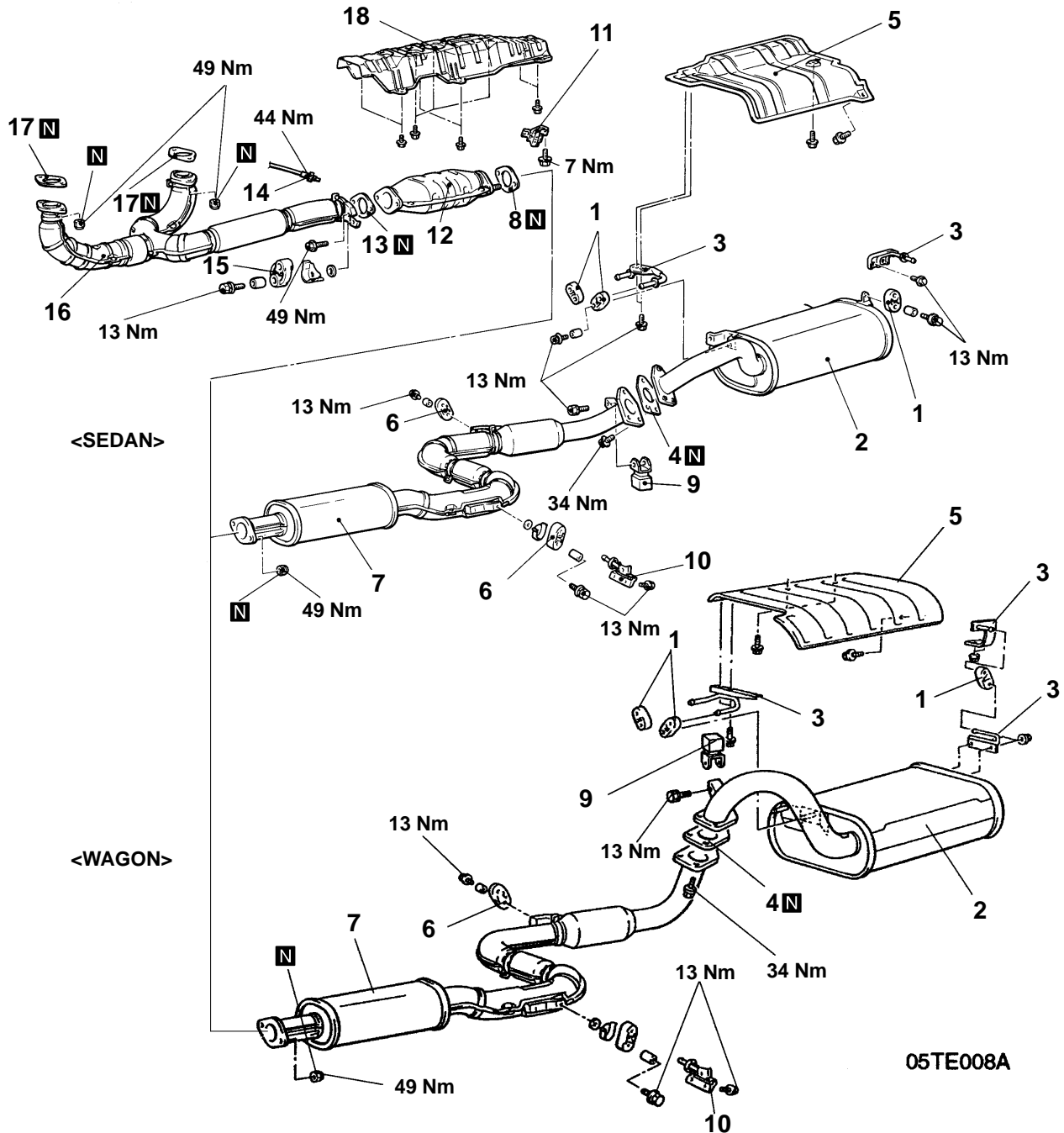
1. Heat protector
2. Exhaust manifold
3. Exhaust manifold gasket

### Removal Procedure for Rear Bank

4. Heat protector
5. EGR pipe
6. EGR pipe gasket
7. Exhaust manifold
8. Exhaust manifold gasket

# EXHAUST PIPE AND MAIN MUFFLER

## REMOVAL AND INSTALLATION



### Main muffler removal steps

1. Hanger
2. Main muffler assembly
3. Hanger bracket
4. Gasket
5. Rear floor heat protector panel

### Centre exhaust pipe removal steps

6. Hanger
7. Centre exhaust pipe
8. Gasket
9. Damper

10. Hanger bracket
11. Harness protector
12. Catalytic converter or pre-muffler
13. Gasket

### Front exhaust pipe removal steps

14. Oxygen sensor
15. Hanger
16. Front exhaust pipe
17. Gasket
18. Front floor heat protector