

GENERAL INFORMATION

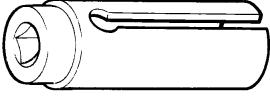
The intake manifold is made of an aluminium alloy, and the shape provides an increased intake inertia effect and has a good volumetric efficiency.

The exhaust pipe is divided into four parts.

SERVICE SPECIFICATIONS

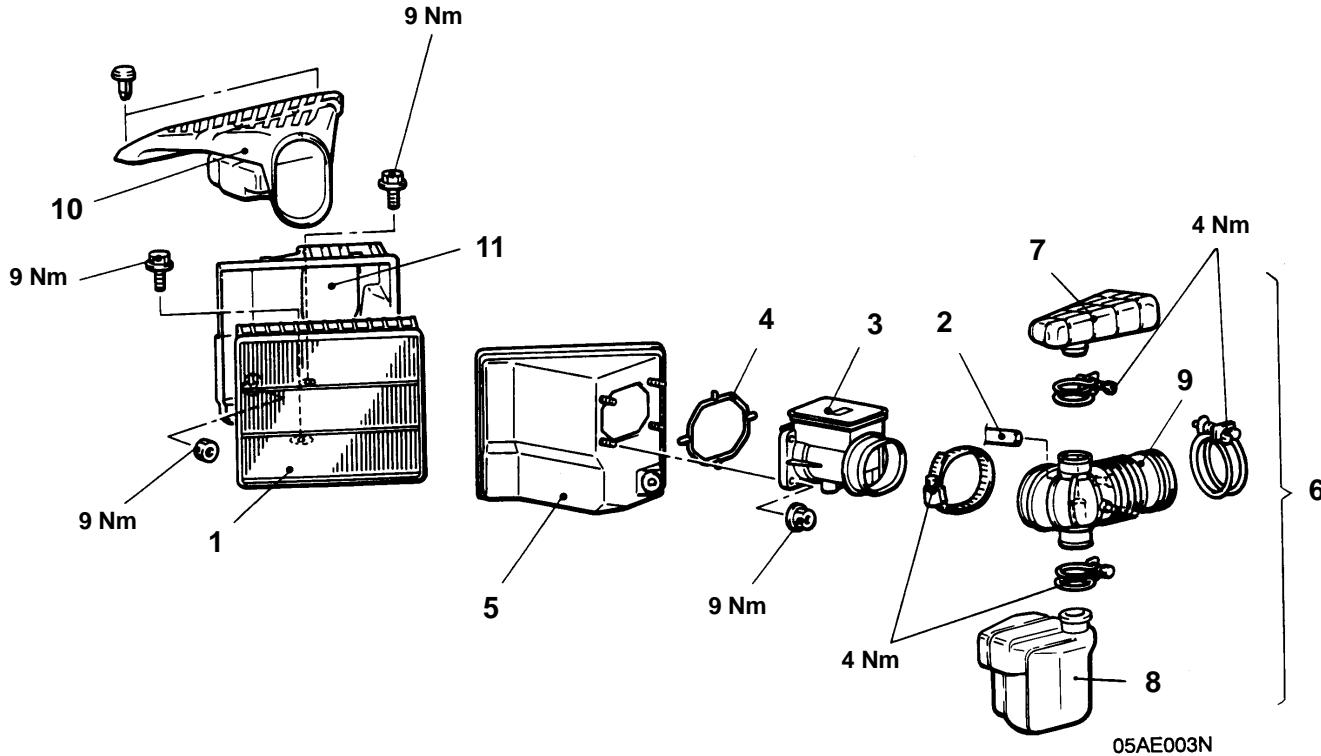
Items	Standard value	Limit
Intake manifold	Distortion of the installation surface mm	0.15 or less

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 [Group 11A 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

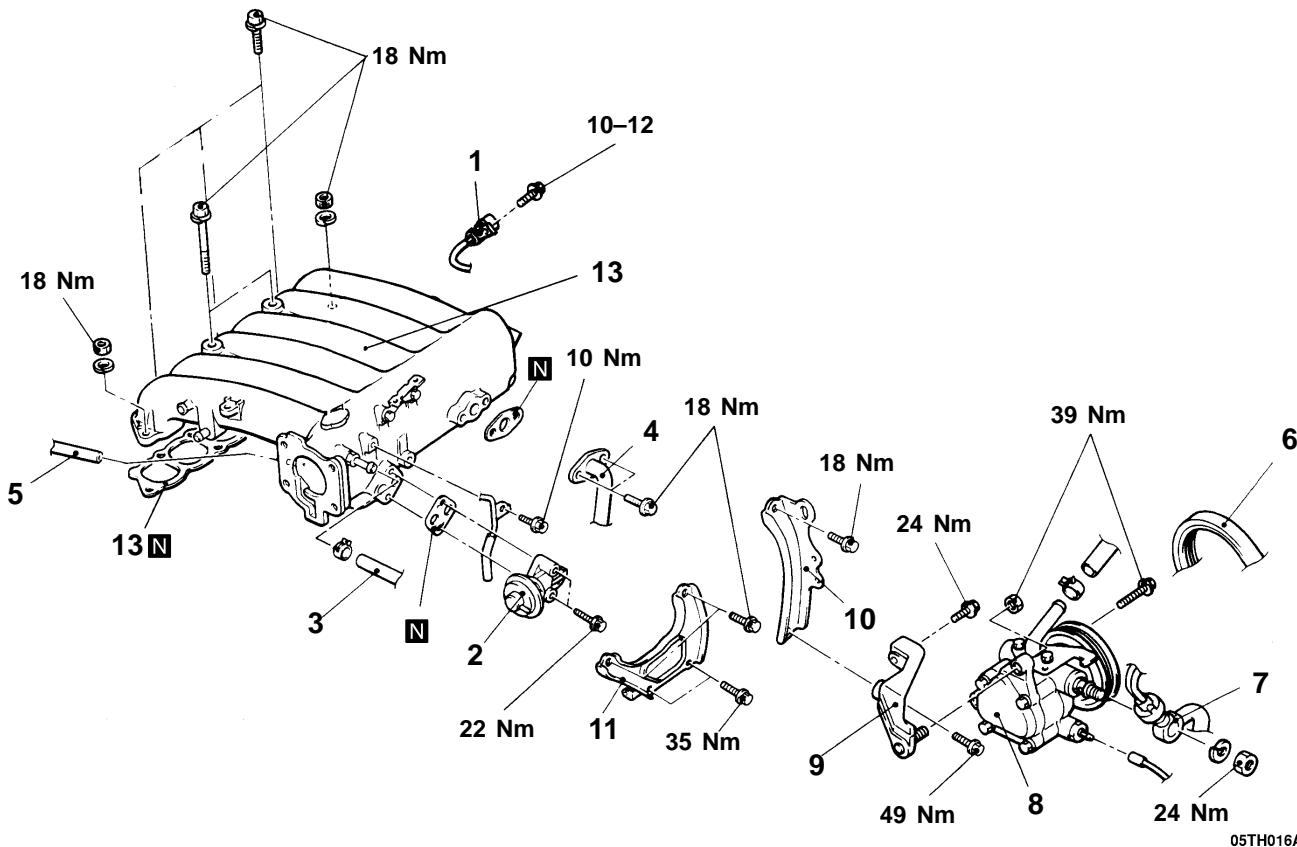
REMOVAL AND INSTALLATION

Pre-removal Operation

- (1) Remove the engine cover (Refer [Group 11B On Vehicle Service.](#))
- (2) Remove the throttle body (Refer [Group 13A On Vehicle Service.](#))
- (3) Drain the power steering fluid (Refer [Group 37 On Vehicle Service.](#))

Post-installation Operation

- (1) Install the throttle body (Refer [Group 13A On Vehicle Service.](#))
- (2) Install the engine cover (Refer [Group 11B On Vehicle Service.](#))
- (3) Add power steering fluid and bleed (Refer [Group 37 On Vehicle Service.](#))
- (4) Adjust the tension of the oil pump belt (Refer [Group 11A On Vehicle Service.](#))

**Removal steps**

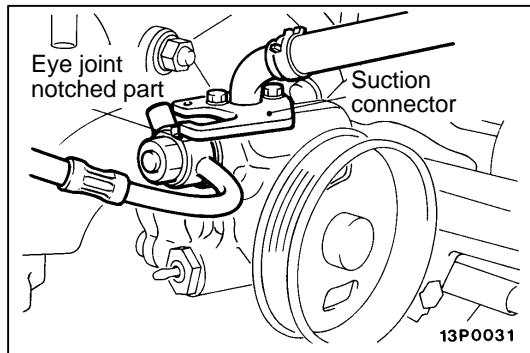
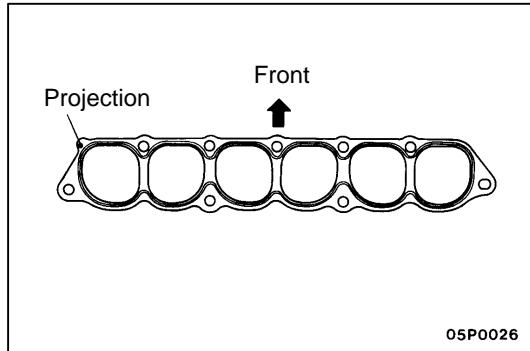
1. Crank angle sensor connector
2. EGR valve assembly
3. Brake booster vacuum hose connection
4. EGR pipe assembly connection
5. Fuel pressure regulator vacuum hose connection
6. Oil pump belt

►B◄ 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

►A◄ 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

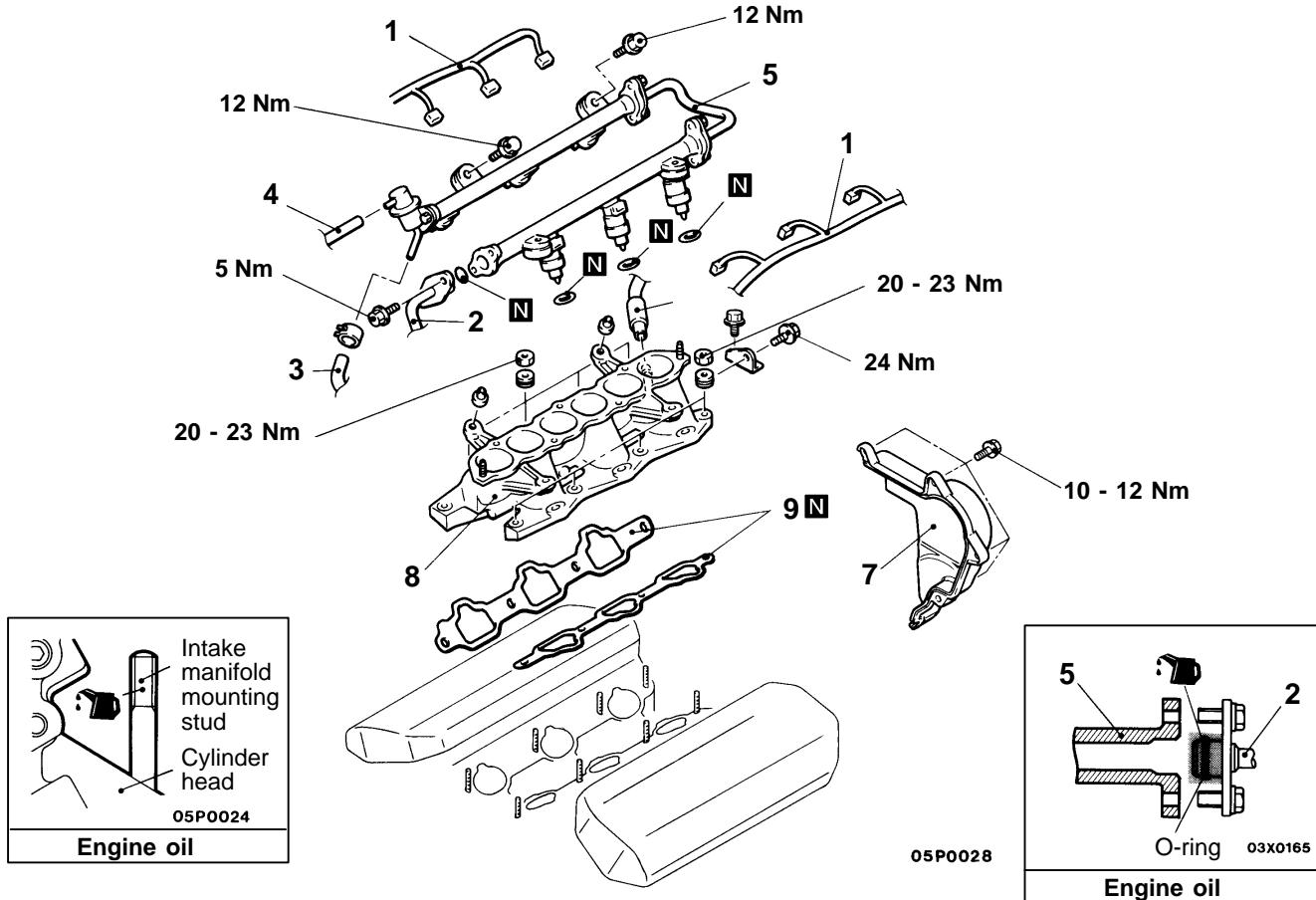
Secure the notched part of the pressure hose eye joint at the position where it contacts the oil pump suction connector.

INTAKE MANIFOLD

REMOVAL AND INSTALLATION

Pre-removal and Post-Installation Operations

- Remove or install the intake manifold plenum (Refer On Vehicle Service.)
- Fuel discharge prevention (Refer Group 13A On Vehicle Service.)

**Removal steps**

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

◀A▶ 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**

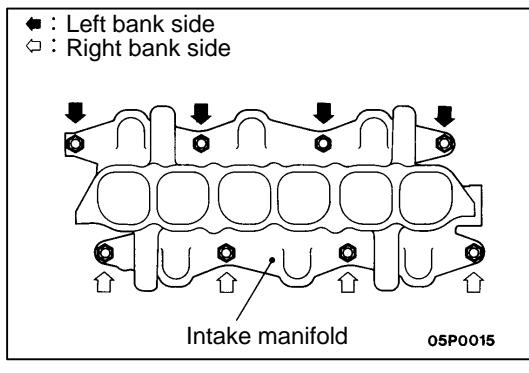
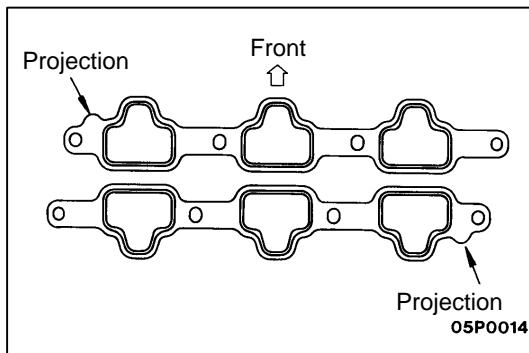
Remove the delivery pipe with the injectors fitted to the delivery pipe.

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.

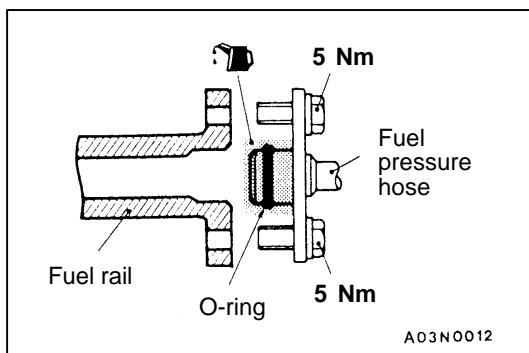
Standard value: 0.15 mm or less**Limit: 0.2 mm****INSTALLATION SERVICE POINT****►A◀ INTAKE MANIFOLD GASKET**

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.**

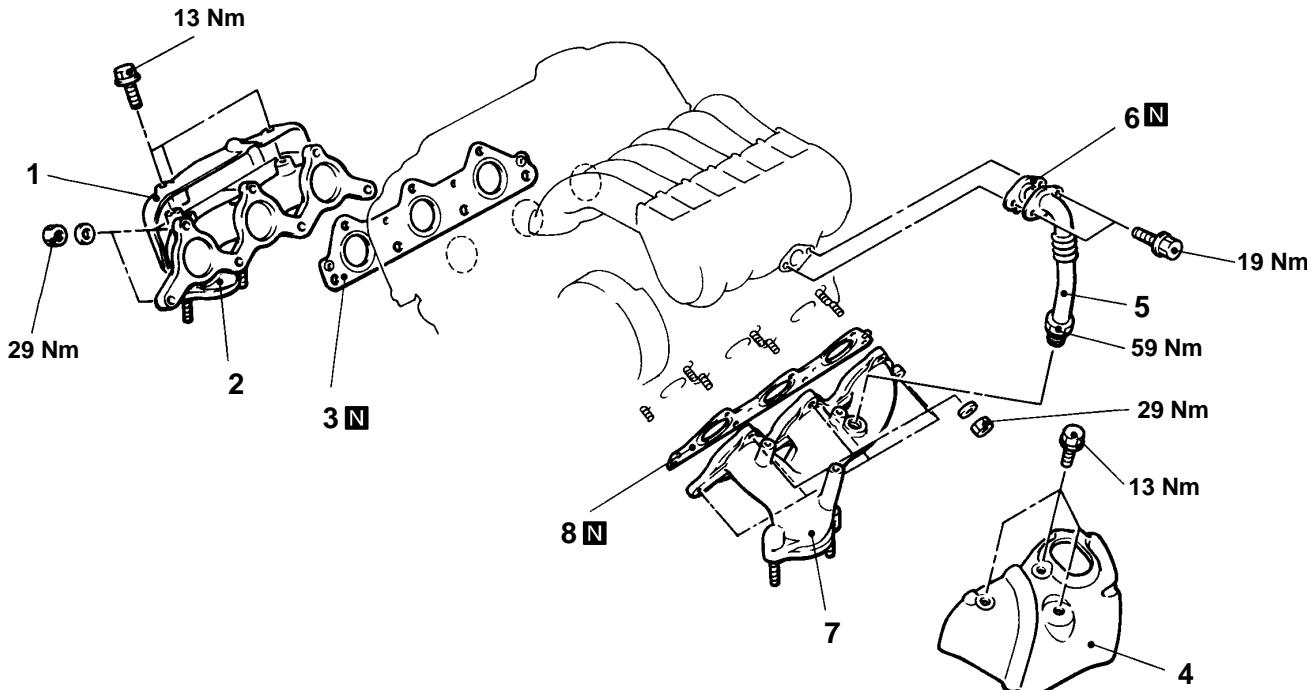
2. Check that the high-pressure fuel hose turns smoothly. If not, remove the hose and then re-insert it into the fuel rail and check again.
3. Tighten the bolts to the specified torque.

EXHAUST MANIFOLD

REMOVAL AND INSTALLATION

Pre-removal and Post-Installation Operations

- Remove or install the front exhaust pipe (Refer [On Vehicle Service](#).)
- Remove or install the radiator (Front bank only) (Refer [Group 14 On Vehicle Service](#).)
- Remove or install the alternator (Front bank only) (Refer [Group 16 On Vehicle Service](#).)



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Removal Procedure for Front Bank

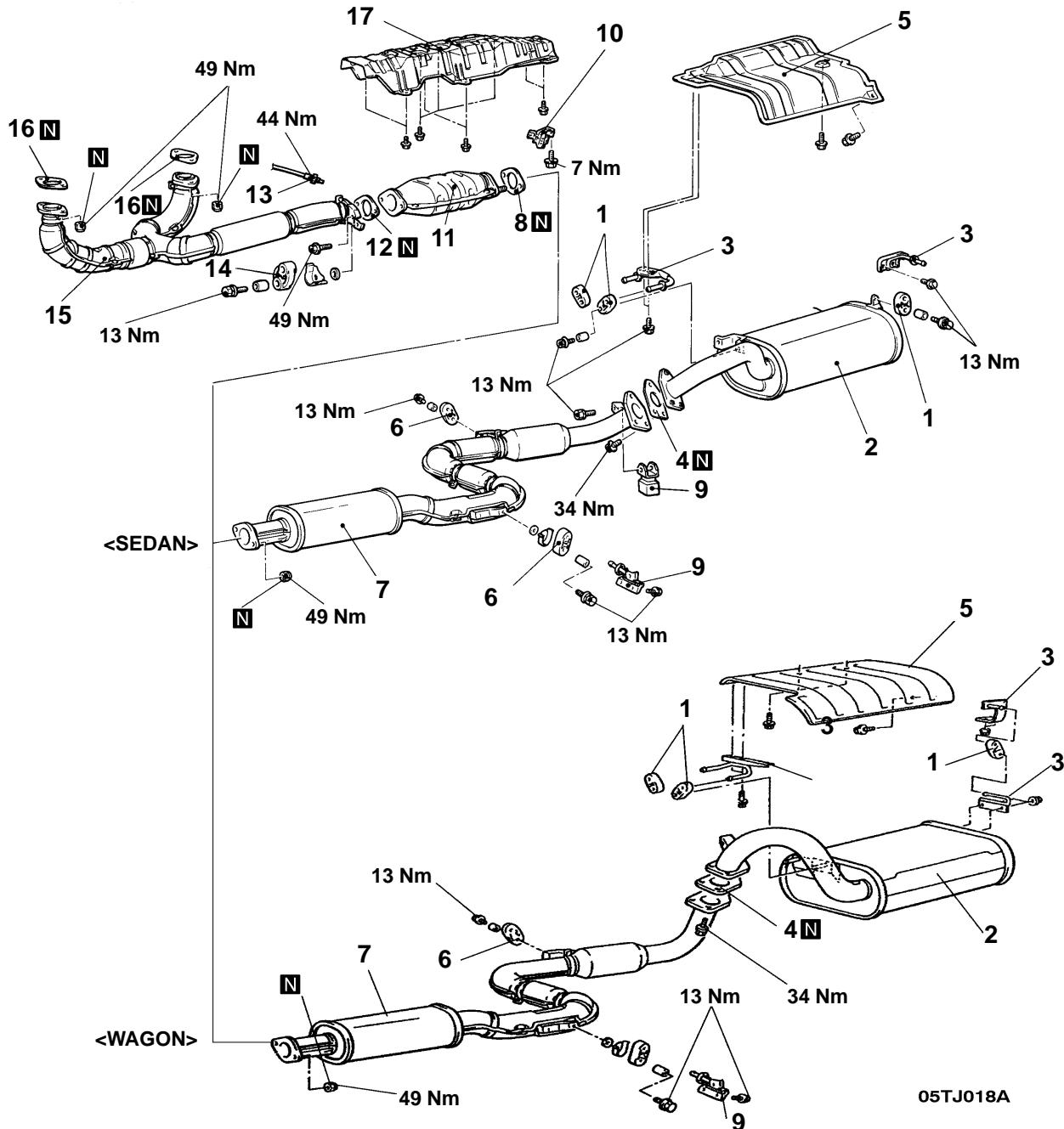
1. Heat protector
2. Exhaust manifold
3. Exhaust manifold gasket

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

Front exhaust pipe removal steps

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